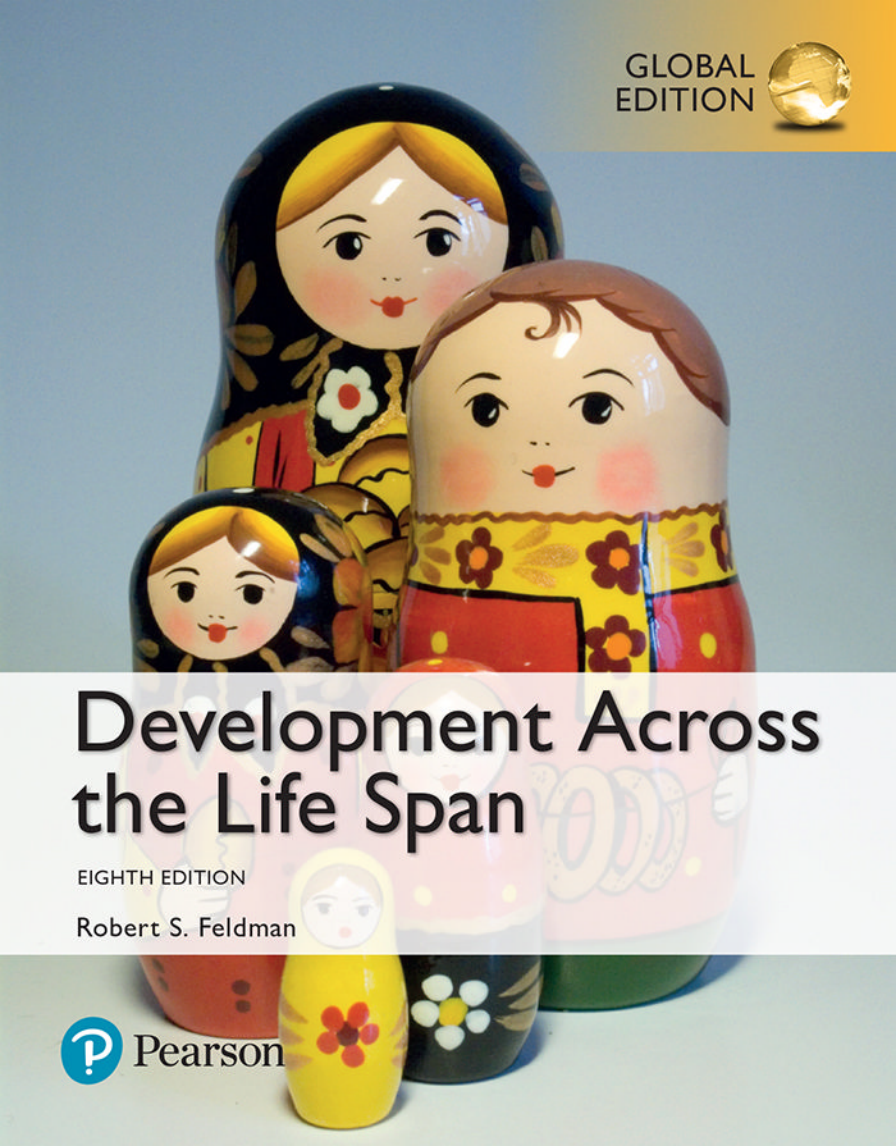

Development Across the Life Span

EIGHTH EDITION

Robert S. Feldman

Pearson

Development Across the Life Span

Eighth Edition

Global Edition

Robert S. Feldman
University of Massachusetts, Amherst

Pearson

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Authorized adaptation from the United States edition, entitled Development Across the Life Span, 8th edition, ISBN 978-0-13-422589-0, by Robert S. Feldman, published by Pearson Education © 2017.

ISBN 10: 1-292-15795-X
ISBN 13: 978-1-292-15795-5

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library.

10 9 8 7 6 5 4 3 2 1
14 13 12 11 10

Typeset in Palatino LT Pro Roman 9.5/13 by Lumina Datamatics, Inc.

Printed and bound in Vivar, Malaysia.

Brief Contents

Contents

PART THREE The Preschool Years

Preface

This book tells a story: the story of our lives, and our parents' lives, and the lives of our children. It is the story of human beings and how they get to be the way they are.

Unlike any other area of study, lifespan development speaks to us in a very personal sense. It covers the range of human existence from its beginnings at conception to its inevitable ending at death. It is a discipline that deals with ideas and concepts and theories, but one that above all has at its heart people—our fathers and mothers, our friends and acquaintances, our very selves.

Development Across the Life Span seeks to capture the discipline in a way that sparks, nurtures, and shapes readers' interest. It is meant to excite students about the field, draw them into its way of looking at the world, and build their understanding of developmental issues. By exposing readers to both the current content and the promise inherent in lifespan development, the text is designed to keep interest in the discipline alive long after students' formal study of the field has ended.

Overview of the Eighth Edition

***Development Across the Life Span*, Eighth Edition**—like its predecessors—provides a broad overview of the field of human development. It covers the entire range of the human life, from the moment of conception through death. The text furnishes a broad, comprehensive introduction to the field, covering basic theories and research findings as well as highlighting current applications outside the laboratory. It covers the life span chronologically, encompassing the prenatal period, infancy and toddlerhood, the preschool years, middle childhood, adolescence, early and middle adulthood, and late adulthood. Within these periods, it focuses on physical, cognitive, and social and personality development.

The book seeks to accomplish the following four major goals:

- First and foremost, the book is designed to provide a broad, balanced overview of the field of lifespan development. It introduces readers to the theories, research, and applications that constitute the discipline, examining both the traditional areas of the field and more recent innovations. It pays particular attention to the applications developed by lifespan development specialists, demonstrating how lifespan developmentalists use theory, research, and applications to help solve significant social problems.
- The second goal of the text is to explicitly tie development to students' lives. Findings from the study of lifespan development have a significant degree of relevance to students, and this text illustrates how these findings can be applied in a meaningful, practical sense. Applications are presented in a contemporaneous framework, including current news items, timely world events, and contemporary uses of lifespan development that draw readers into the field. Numerous descriptive scenarios and vignettes reflect everyday situations in people's lives, explaining how they relate to the field.
- The third goal is to highlight both the commonalities and diversities of today's multicultural society. Consequently, the book incorporates material relevant to diversity in all its forms—racial, ethnic, gender, sexual orientation, religion, and cultural—throughout every chapter. In addition, every chapter has at least one *Developmental Diversity* chapter. These features explicitly consider how cultural factors relevant to development both unite and diversify our contemporary, global society.
- Finally, the fourth goal is one that is implicit in the other three: making the field of lifespan development engaging, accessible, and interesting to students. Lifespan development is a joy both to study and teach because so much of it has direct, immediate meaning to our lives. Because all of us are involved in our own developmental paths, we are tied in very personal ways to the content areas covered by the book. ***Development Across the Life Span***, then, is meant to engage and nurture this interest, planting a seed that will develop and flourish throughout readers' lifetimes.

In accomplishing these goals, the book strives to be user friendly. Written in a direct, conversational voice, it duplicates as much as possible a dialogue between author and student. The text is meant to be understood and mastered on its own by students of every level of interest and motivation. To that end, it includes a variety of pedagogical features that promote mastery of the material and encourage critical thinking.

In short, the book blends and integrates theory, research, and applications, focusing on the breadth of human development. Furthermore, rather than attempting to provide a detailed historical record of the field, it focuses on the here and now, drawing on the past where appropriate, but with a view toward delineating the field as it now stands and the directions toward which it is evolving. Similarly,

while providing descriptions of classic studies, the emphasis is more on current research findings and trends.

Development Across the Life Span is meant to be a book that readers will want to keep in their own personal libraries, one that they will take off the shelf when considering problems related to that most intriguing of questions: How do people come to be the way they are?

Special Features

Chapter-Opening Prologues
Each chapter begins with a short vignette, describing an individual or situation that is relevant to the basic developmental issues being discussed in the chapter.

Looking Ahead Sections
These opening sections orientate readers to the topics to be covered, bridging the opening prologue with the remainder of the chapter.

Learning Objectives
Each major section includes explicit learning objectives. These numbered learning objectives provide a means for instructors to evaluate student mastery of specific content.

From Research to Practice
Each chapter includes a section that describes current developmental research applied to everyday problems, helping students to see the impact of developmental research throughout society. Many are new in this edition.

Developmental Diversity
Every chapter has at least one "Developmental Diversity" section incorporated into the text. These sections highlight issues relevant to today's multicultural society.

Running Glossary
Key terms are defined in the margins of the page on which the term is presented.

Are You an Informed Consumer of Development?
Every chapter includes information on specific uses that can be derived from research conducted by developmental investigators.

Review and Journal Prompt Sections
Interspersed throughout each chapter are three short recaps of the chapter's main points, as well as Journal Prompts designed to elicit critical thinking about the subject matter through written responses.

End-of-Chapter Material
Each chapter ends with a summary and an Epilogue that refers back to the opening Prologue and that ties the chapter together. The Looking Back summary is keyed to the chapter's learning objectives.

Career References
Students will encounter frequent questions throughout the text designed to show the applicability of the material to a variety of professions, including education, nursing, social work, and health-care providers.

Putting It All Together
In end-of-part integrative concept maps, a short vignette is presented and students are asked to consider the vignette from both their point of view and the point of view of parents, educators, health-care workers, social workers, and so on.

What's New in the Eighth Edition?

The revision includes a number of significant changes and additions. Most importantly, the text now includes a comprehensive list of specific, numbered learning objectives. This helps instructors to design tests focused on certain learning objectives and students to direct their study most effectively and efficiently.

In addition, every chapter begins with a new opening vignette that introduces students to the real-world implications of the chapter topic. Furthermore, almost all *From Research to Practice* boxes—which describe a contemporary developmental research topic and its applied implications—are new to this edition.

Finally, the Eighth Edition of ***Development Across the Life Span*** incorporates a significant amount of new and updated information. For instance, advances in such areas as behavioral genetics, brain development, evolutionary perspectives, and cross-cultural approaches to development receive expanded and new coverage. Overall, hundreds of new citations have been added, with most of those from articles and books published in the last few years.

New topics were added to every chapter. The following sample of new and revised topics featured in this edition provides a good indication of the currency of the revision:

Chapter 1

- Update on the first person conceived *in vitro*
- Control of children's use of the Internet
- Long-term effects of war

Chapter 2

- Fetal alcohol syndrome disorder
- Update incidence of hunger
- Updated incidence of Down's Syndrome births
- Updated incidence of Klinfelter's syndrome
- Abortion aftereffects
- Miscarriage

New DSM terminology:

- Autism spectrum disorder
- Schizophrenia disorder spectrum disorder
- Major depression disorder
- Interpretation of birth defect probability

Chapter 3

- Advantages of infant massage
- U.S. infant mortality rate (new figure)
- Taste preferences being in utero
- Parents modify speech when talking to infants

Chapter 4

- Percentage of deaths from shaken baby syndrome
- Brain plasticity
- Sudden infant death syndrome statistics (new figure)
- Malnutrition in the United States
- Malnutrition worldwide (new figure)
- Percentage of low-income and poor families (new figure)
- Recent research on breast milk
- Infant massage associated with social development

Chapter 5

- Sucking reflex and transition to next stage
- Brain growth and infantile amnesia
- Usefulness of Bayley Scales
- Change in style of speech with foreigners

Chapter 6

- Infant emotions
- Fathers' involvement child care
- Fusiform gyrus and attention to children's faces
- "Expert" babies
- Update on families in the twenty-first century

Chapter 7

- Update on obesity in children
- Update on depressive orders in children
- Television viewing and other media use (new figure)

Chapter 8

- Play and brain development
- Autism spectrum disorder
- One-parent families

Chapter 9

- Asthma "triggers"
- Childhood-onset fluency disorder
- Specific learning disorders
- New figure on ADHD incidence rise

Chapter 10

- Dealing with bullying
- New figure on single parent households
- Gay and Lesbian parenting

Chapter 11

- Obesity and fast foods
- Sleep deprivation in adolescents
- New trends in e-cigarette use
- Changes in marijuana usage

Chapter 12

- Empathy in adolescence
- Transexualism

Chapter 13

- International homicide rates
- Obesity
- Exercise and longevity

Chapter 14

- Gender wage gap changes
- Emerging adulthood
- Same-sex marriage

Chapter 15

- Coronary heart disease rates
- Breast cancer incidence
- Genetic screening for future illness susceptibility

Chapter 16

- Change in immigration statistics
- Relationship between perceived age and chronological age: health outcomes

Chapter 17

- Life span statistics
- Proportion of people over 60
- Risk of falling

Chapter 18

- Poverty and the elderly
- Increase in divorce among elderly
- Aging as a state of mind

Chapter 19

- Cost of funeral update
- Increasing popularity of cremation

Ancillaries

***Development Across the Life Span*, Eighth Edition**, is accompanied by a superb set of teaching and learning material.

Print and Media Supplements for the Instructor

- **Instructor's Resource Manual.** The Instructor's Resource Manual has been thoroughly reviewed and revised for the eighth edition. It includes learning objectives, key terms and concepts, self-contained lecture suggestions, and class activities for each chapter.

  The Instructor's Resource Manual will be available for download via the Pearson Instructor's Resource Center (www.pearsonglobaleditions.com) or on the MyPsychLab® platform (www.MyPsychLab.com).

- **Video Enhanced PowerPoint Slides.** These slides bring the Feldman design right into the classroom, drawing students into the lecture and providing wonderful interactive activities, visuals, and videos.

- **PowerPoint Lecture Slides.** The lecture slides provide an active format for presenting concepts from each chapter and feature prominent figures and tables from the text. The PowerPoint Lecture Slides are available for download via the Pearson Instructor's Resource Center (www.pearsonglobaleditions.com) or on the MyPsychLab® platform (www.MyPsychLab.com).

- **Test Bank.** For the eighth edition, each question was checked for accuracy to ensure that the correct answer was marked and the page reference was accurate. The test bank contains over 3,000 multiple-choice, true/false, and essay questions, each referenced to the relevant page in the book and correlated to chapter learning objectives. The test bank features the identification of each question as factual, conceptual, or applied and also makes use of Bloom's Taxonomy. Finally, each item is also identified in terms of difficulty level to allow professors to customize their tests and ensure a balance of question types. Each chapter of the test item file begins with the Total Assessment Guide: an easy-to-reference grid that makes creating tests easier by organizing the test questions by text section, question type, and whether it is factual, conceptual, or applied.

- **MyPsychLab.** Available at www.MyPsychLab.com, **MyPsychLab** is an online homework, tutorial, and assessment program that truly engages students in learning. It helps students better prepare for class, quizzes, and exams—resulting in better performance in the course. It provides educators a dynamic set of tools for gauging individual and class performance:

The eighth edition includes integrated videos and media content throughout, allowing students to explore topics more deeply at the point of relevancy. This content is available on MyPsychLab.

- **Customizable.** MyPsychLab is customizable. Instructors choose what students' course looks like. Homework, applications, and more can easily be turned on and off.
- **Assignment Calendar and Gradebook.** A drag and drop assignment calendar makes assigning and completing work easy. The automatically graded assessment provides instant feedback and flows into the gradebook, which can be used in the MyPsychLab or exported.
- **Personalized Study Plan.** Students' personalized plans promote better critical thinking skills. The study plan organizes students' study needs into sections, such as Remembering, Understanding, Applying, and Analyzing.

Video Resource for Instructors

- **Pearson Teaching Films Lifespan Development Video** engages students and brings to life a wide range of topics spanning prenatal through the end of the life span. International videos shot on location allow students to observe similarities and differences in human development across various cultures.

Supplementary Texts

Contact your Pearson representative to package any of these supplementary texts with *Development Across the Life Span*, Eighth Edition.

- ***Current Directions in Developmental Psychology.*** Readings from the American Psychological Society. This exciting reader includes over 20 articles that have been carefully selected for the undergraduate audience, and taken from the very accessible *Current Directions*

in Psychological Science journal. These timely, cutting-edge articles allow instructors to bring their students a real-world perspective about today's most current and pressing issues in psychology. The journal is discounted when packaged with this text for college adoptions.

- ***Twenty Studies That Revolutionized Child Psychology by* Wallace E. Dixon, Jr..** Presenting the seminal research studies that have shaped modern developmental psychology, this brief text provides an overview of the environment that gave rise to each study, its experimental design, its findings, and its impact on current thinking in the discipline.
- ***Human Development in Multicultural Contexts: A Book of Readings*.** Written by Michele A. Paludi, this compilation of readings highlights cultural influences in developmental psychology.
- ***The Psychology Major: Careers and Strategies for Success*.** Written by Eric Landrum (Idaho State University), Stephen Davis (Emporia State University), and Terri Landrum (Idaho State University), this 160-page paperback provides valuable information on career options available to psychology majors, tips for improving academic performance, and a guide to the APA style of research reporting.

Acknowledgments

I am grateful to the following reviewers who have provided a wealth of comments, constructive criticism, and encouragement:

Wanda Clark—South Plains College; Ariana Durando—Queens College; Dawn Kriebel—Immaculata University; Yvonne Larrier—Indiana University South Bend; Meghan Novy—Palomar College; Laura Pirazzi—San Jose State University

Kristine Anthis—Southern Connecticut State University; Jo Ann Armstrong—Patrick Henry Community College; Sindy Armstrong—Ozarks Technical College; Stephanie Babb—University of Houston-Downtown; Verneda Hamm Baugh—Kean University; Laura Brandt—Adlai E. Stevenson High School; Jennifer Brennom—Kirkwood Community College; Lisa Brown—Frederick Community College; Cynthia Calhoun—Southwest Tennessee Community College; Cara Cashon—University of Louisville; William Elmhorst—Marshfield High School; Donnell Griffin—Davidson County Community College; Sandra Hellyer—Ball State University; Dr. Nancy Kalish—California State University, Sacramento; Barb Ramos—Simpson College; Linda Tobin—Austin Community College; Scott Young—Iowa State University.

Amy Boland—Columbus State Community College; Ginny Boyum—Rochester Community and Technical College; Krista Forrest—University of Nebraska at Kearney; John Gambon—Ozarks Technical College; Tim Killian—University of Arkansas; Peter Matsos—Riverside City College; Troy Schiedenhelm—Rowan-Cabarrus Community College; Charles Shairs—Bunker Hill Community College; Deirdre Slavik—NorthWest Arkansas Community College; Cassandra George Sturges—Washtenaw Community College; Rachelle Tannenbaum—Anne Arundel Community College; Lois Willoughby—Miami Dade College.

Nancy Ashton, R. Stockton College; Dana Davidson, University of Hawaii at Manoa; Margaret Dombrowski, Harrisburg Area Community College; Bailey Drechsler, Cuesta College; Jennifer Farell, University of North Carolina—Greensboro; Carol Flaugher, University at Buffalo; Rebecca Glover, University of North Texas; R. J. Grisham, Indian River Community College; Martha Kuehn, Central Lakes College; Heather Nash, University of Alaska Southeast; Sadie Oates, Pitt Community College; Patricia Sawyer, Middlesex Community College; Barbara Simon, Midlands Technical College; Archana Singh, Utah State University; Joan Thomas—Spiegel, Los Angeles Harbor College; Linda Veltri, University of Portland.

Libby Balter Blume, University of Detroit Mercy; Bobby Carlsen, Averett College; Ingrid Cominsky, Onondaga Community College; Amanda Cunningham, Emporia State University; Felice J. Green, University of North Alabama; Mark Hartlaub, Texas A&M University—Corpus Christi; Kathleen Hulbert, University of Massachusetts—Lowell; Susan Jacob, Central Michigan University; Laura Levine, Central Connecticut State University; Pamelyn M. MacDonald, Washburn University; Jessica Miller, Mesa State College; Shirley Albertson Owens, Vanguard University of Southern California; Stephanie Weyers, Emporia State University; Karen L. Yanowitz, Arkansas State University.

Many others deserve a great deal of thanks. I am indebted to the numerous people who provided me with a superb education, first at Wesleyan University and later at the University of Wisconsin. Specifically, Karl Scheibe played a pivotal role in my undergraduate education, and the late Vernon Allen acted as mentor and guide through my graduate years. It was in graduate school that I learned about development, being exposed to such experts as Ross Parke, John Balling, Joel Levin, Herb Klausmeier, and many others. My education continued when I became a professor. I am especially grateful to my colleagues at the University of Massachusetts, who make the university such a wonderful place in which to teach and do research.

Several people played central roles in the development of this book. John Bickford provided important research and editorial input, and I am thankful for their help. Most of all, John Graiff was essential in juggling and coordinating the multiple aspects of writing a book, and I am very grateful for the substantial role he played.

I am also grateful to the superb Pearson team that was instrumental in the inception and development of this book. Amber Chow, senior editor, brought enthusiasm and a wealth of thoughtful ideas to this edition. Program manager Cecilia Turner went way beyond the call of duty to provide help in bringing this book to press I am grateful for their support. Most of all, I want to thank the always creative and thoughtful Shannon LeMay-Finn, who played an absolutely critical role in bringing this book to fruition.

On the production end of things, Denise Forlow, the team lead, and Shelly Kupperman, the project manager, helped in bringing all the aspects of the text together. I am also perennially grateful to Jeff Marshall, whose many ideas permeate this book. Finally, I'd like to thank (in advance) marketing manager Lindsey Prudhomme Gill, on whose skills I'm counting.

I also wish to acknowledge the members of my family, who play such an essential role in my life. My brother, Michael, my sisters-in-law and brother-in-law, my nieces and nephews—all make up an important part of my life. In addition, I am always indebted to the older generation of my family, who led the way in a manner I can only hope to emulate. I will always be obligated to the late Harry Brochstein, Mary Vorwerk, and Ethel Radler. Most of all, the list is headed by my father, the late Saul Feldman, and my mother, Leah Brochstein.

In the end, it is my immediate family who deserve the greatest thanks. My terrific kids, Jonathan and wife Leigh; Joshua and wife Julie; and Sarah and husband Jeff not only are nice, smart, and good-looking, but my pride and joy. My wonderful grandchildren, Alex, Miles, Naomi, and Lilia, have brought immense happiness from the moment of their births. And ultimately my wife, Katherine Vorwerk, provides the love and grounding that makes everything worthwhile. I thank them, with all my love.

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Acknowledgments for the Global Edition

For their contribution to the Global Edition, Pearson wishes to acknowledge and thank the following people:

Contributor:

Elizabeth Wright, Murdoch University Dubai

Reviewers:

Albert Lee Kai Chung, Nanyang Technological University
Alizeh Batra Merchant, New York University Abu Dhabi
Maryjane Bock, Murdoch University Dubai

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Robert S. Feldman is Professor of Psychological and Brain Sciences and Deputy Chancellor of the University of Massachusetts, Amherst. A recipient of the College Distinguished Teacher Award, he teaches psychology classes ranging in size from 15 to nearly 500 students. During the course of more than three decades as a college instructor, he has taught both undergraduate and graduate courses at Mount Holyoke College, Wesleyan University, and Virginia Commonwealth University in addition to the University of Massachusetts.

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A Fellow of the American Psychological Association, the Association for Psychological Science, and the American Association for the Advancement of Science, Professor Feldman received a B.A. with High Honors from Wesleyan University (from which he received the Distinguished Alumni Award). He has an MS and Ph.D. from the University of Wisconsin-Madison. He is a winner of a Fulbright Senior Research Scholar and Lecturer award, and he has written more than 100 books, book chapters, and scientific articles. He has edited *Development of Nonverbal Behavior in Children* (Springer-Verlag) and *Applications of Nonverbal Behavioral Theory and Research* (Erlbaum), and co-edited *Fundamentals of Nonverbal Behavior* (Cambridge University Press). He is also author of *Child Development, Understanding Psychology*, and *P.O.W.E.R. Learning: Strategies for Success in College and Life*. His books have been translated into many languages, including Spanish, French, Portuguese, Dutch, Chinese, Korean, German, Arabic, and Japanese. His research interests include honesty and deception in everyday life, work that he described in *The Liar in Your Life*, a trade book published in 2009. His research has been supported by grants from the National Institute of Mental Health and the National Institute on Disabilities and Rehabilitation Research.

Professor Feldman is president of the Federation of Associations of Behavioral and Brain Sciences Foundation, a consortium of societies that benefit the social sciences. In addition, he is on the Board of New England Public Radio. Professor Feldman loves music, is an enthusiastic pianist, and enjoys cooking and traveling. He has three children, four grandchildren, and he and his wife, a psychologist, live in western Massachusetts in a home overlooking the Holyoke Mountain Range.

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Chapter 1

An Introduction to Lifespan Development

Learning Objectives

LO 1.1 Define the field of lifespan development and describe what it encompasses.

LO 1.2 Describe the areas that lifespan development specialists cover.

LO 1.3 Describe some of the basic influences on human development.

LO 1.4 Summarize four key issues in the field of lifespan development.

LO 1.5 Describe how the psychodynamic perspective explains lifespan development.

LO 1.6 Describe how the behavioral perspective explains lifespan development.

LO 1.7 Describe how the cognitive perspective explains lifespan development.

LO 1.8 Describe how the humanistic perspective explains lifespan development.

LO 1.9 Describe how the contextual perspective explains lifespan development.

LO 1.10 Describe how the evolutionary perspective explains lifespan development.

LO 1.11 Discuss the value of applying multiple perspectives to lifespan development.

LO 1.12 Describe the role that theories and hypotheses play in the study of development.

LO 1.13 Compare the two major categories of lifespan development research.

LO 1.14 Identify different types of correlational studies and their relationship to cause and effect.

LO 1.15 Explain the main features of an experiment.

LO 1.16 Distinguish between theoretical research and applied research.

LO 1.17 Compare longitudinal research, cross-sectional research, and sequential research.

LO 1.18 Describe some ethical issues that affect psychological research.

Chapter Overview

Prologue: New Conceptions

What if for your entire life, the image that others held of you was colored by the way in which you were conceived?

In some ways, that's what it has been like for Louise Brown, who was the world's first "test tube baby," born by in vitro fertilization (IVF), a procedure in which fertilization of a mother's egg by a father's sperm takes place outside of the mother's body.

Louise was a preschooler when her parents told her how she was conceived, and throughout her childhood she was bombarded with questions. It became routine to explain to her classmates that she, in fact, was not born in a laboratory.

As a child, Louise sometimes felt completely alone. "I thought it was something peculiar to me," she recalled. But as she grew older, her isolation declined as more and more children were born in the same manner.

In fact, today Louise is hardly isolated. More than 5 million babies have been born using the same procedure, which has become almost routine. And at the age of 28, Louise became a mother herself, giving birth to a baby boy named Cameron—conceived, incidentally, the old-fashioned way (Falco, 2012; ICMRT, 2012). ■

Looking Ahead

Louise Brown's conception may have been novel, but her development, from infancy, through childhood and adolescence, to her marriage and the birth of her baby, has followed a predictable pattern. The specifics of our development vary: some encounter economic deprivation or live in war-torn territories; others contend with genetic or family issues like divorce and step-parents. The broad strokes of development, however, set in motion in that test tube all those years ago, are remarkably similar for all of us. Like

LeBron James, Bill Gates, and the Queen of England, each and every one of us is traversing the territory known as lifespan development.

Louise Brown's conception in the lab is just one of the brave new worlds of the twenty-first century. Issues ranging from cloning to the consequences of poverty on development or the prevention of AIDS raise significant concerns that affect human development. Underlying these are even more fundamental issues: How do we develop physically? How does our understanding of the world grow and change throughout our lives? And how do our personalities and our social relationships develop as we move from birth through the entire span of our lives?

Louise Brown and her son.

Each of these questions, and many others we'll encounter throughout this book, are central to the field of lifespan development. As a field, lifespan development encompasses not only a broad span of time—from before birth to death—but also a wide range of areas of development. Consider, for example, the range of interests that different specialists in lifespan development focus on when considering the life of Louise Brown:

- Lifespan development researchers who investigate behavior at the level of biological processes might determine if Louise's functioning prior to birth was affected by her conception outside the womb.
- Specialists in lifespan development who study genetics might examine how the genetic endowment from Louise's parents affects her later behavior.
- For lifespan development specialists who investigate the ways thinking changes over the course of life, Louise's life might be examined in terms of how her understanding of the nature of her conception changed as she grew older.
- Researchers in lifespan development who focus on physical growth might consider whether her growth rate differed from children conceived more traditionally.
- Lifespan development experts who specialize in the social world and social relationships might look at the ways that Louise interacted with others and the kinds of friendships she developed.

Although their interests take many forms, these specialists in lifespan development share one concern: understanding the growth and change that occur during the course of life. Taking many differing approaches, developmentalists study how both the biological inheritance from our parents and the environment in which we live jointly affect our behavior.

Some developmentalists focus on explaining how our genetic background can determine not only how we look but also how we behave and relate to others in a consistent manner—that is, matters of personality. They explore ways to identify how much of our potential as human beings is provided—or limited—by heredity. Other lifespan development specialists look to the environment, exploring ways in which our lives are shaped by the world that we encounter. They investigate the extent to which we are shaped by our early environments, and how our current circumstances influence our behavior in both subtle and evident ways.

Whether they focus on heredity or environment, all developmental specialists acknowledge that neither heredity nor environment alone can account for the full range of human development and change. Instead, our understanding of people's development requires that we look at the interaction of heredity and environment, attempting to grasp how both, in the end, contribute to human behavior.

In this chapter, we orient ourselves to the field of lifespan development. We begin with a discussion of the scope of the discipline, illustrating the wide array of topics it

covers and the full range of ages, from conception to death, that it examines. We also survey the key issues and controversies of the field and consider the broad perspectives that developmentalists take. Finally, we discuss the ways developmentalists use research to ask and answer questions.

An Orientation to Lifespan Development

Have you ever wondered how it is possible that an infant tightly grips your finger with tiny, perfectly formed hands? Or marveled at how a preschooler methodically draws a picture? Or at the way an adolescent can make involved decisions about whom to invite to a party or the ethics of downloading music files? Or the way a middle-aged politician can deliver a long, flawless speech from memory? Or wondered what it is that makes a grandfather at 80 so similar to the father he was when he was 40?

If you've ever wondered about such things, you are asking the kinds of questions that scientists in the field of *lifespan development* pose. In this section, we'll examine how the field of lifespan development is defined, the scope of the field, as well as some basic influences on human development.

Defining Lifespan Development

LO 1.1 Define the field of lifespan development and describe what it encompasses.

lifespan development
the field of study that examines patterns of growth, change, and stability in behavior that occur throughout the entire life span

Lifespan development is the field of study that examines patterns of growth, change, and stability in behavior that occur throughout the entire life span. Although the definition of the field seems straightforward, the simplicity is somewhat misleading. In order to understand what development is actually about, we need to look underneath the various parts of the definition.

In its study of growth, change, and stability, lifespan development takes a *scientific* approach. Like members of other scientific disciplines, researchers in lifespan development test their assumptions about the nature and course of human development by applying scientific methods. As we'll see later in the chapter, they develop theories about development, and they use methodical, scientific techniques to validate the accuracy of their assumptions systematically.

Lifespan development focuses on *human* development. Although there are developmentalists who study the course of development in nonhuman species, the vast majority examine growth and change in people. Some seek to understand universal principles of development, whereas others focus on how cultural, racial, and ethnic differences affect the course of development. Still others aim to understand the unique aspects of individuals, looking at the traits and characteristics that differentiate one person from another. Regardless of approach, however, all developmentalists view development as a continuing process throughout the life span.

How people grow and change over the course of their lives is the focus of lifespan development.

As developmental specialists focus on the ways people change and grow during their lives, they also consider stability in people's lives. They ask in which areas, and in what periods, people show change and growth, and when and how their behavior reveals consistency and continuity with prior behavior.

Finally, developmentalists assume that the process of development persists throughout every

part of people's lives, beginning with the moment of conception and continuing until death. Developmental specialists assume that in some ways people continue to grow and change right up to the end of their lives, while in other respects their behavior remains stable. At the same time, developmentalists believe that no particular, single period of life governs all development. Instead, they believe that every period of life contains the potential for both growth and decline in abilities and that individuals maintain the capacity for substantial growth and change throughout their lives.

The Scope of the Field of Lifespan Development

LO 1.2 Describe the areas that lifespan development specialists cover.

Clearly, the definition of lifespan development is broad and the scope of the field is extensive. Consequently, lifespan development specialists cover several quite diverse areas, and a typical developmentalist will choose to specialize in both a topical area and an age range.

TOPICAL AREAS IN LIFESPAN DEVELOPMENT. Some developmentalists focus on **physical development**, examining the ways in which the body's makeup—the brain, nervous system, muscles, and senses, and the need for food, drink, and sleep—helps determine behavior. For example, one specialist in physical development might examine the effects of malnutrition on the pace of growth in children, while another might look at how athletes' physical performance declines during adulthood (Fell & Williams, 2008; Muiños & Ballesteros, 2014).

physical development
development involving the body's physical makeup, including the brain, nervous system, muscles, and senses, and the need for food, drink, and sleep

Other developmental specialists examine **cognitive development**, seeking to understand how growth and change in intellectual capabilities influence a person's behavior. Cognitive developmentalists examine learning, memory, problem-solving skills, and intelligence. For example, specialists in cognitive development might want to see how problem-solving skills change over the course of life, or whether cultural differences exist in the way people explain their academic successes and failures. They would also be interested in how a person who experiences significant or traumatic events early in life would remember them later in life (Alibali, Phillips, & Fischer, 2009; Dumka et al., 2009; Penido et al., 2012).

cognitive development
development involving the ways that growth and change in intellectual capabilities influence a person's behavior

Finally, some developmental specialists focus on personality and social development. **Personality development** is the study of stability and change in the enduring characteristics that differentiate one person from another over the life span. **Social development** is the way in which individuals' interactions with others and their social relationships grow, change, and remain stable over the course of life. A developmentalist interested in personality development might ask whether there are stable, enduring personality traits throughout the life span, whereas a specialist in social development might examine the effects of racism or poverty or divorce on development (Evans, Boxhill, & Pinkava, 2008; Lansford, 2009; Tine, 2014). These four major topic areas—physical, cognitive, social, and personality development—are summarized in Table 1-1.

personality development
development involving the ways that the enduring characteristics that differentiate one person from another change over the life span

social development
the way in which individuals' interactions with others and their social relationships grow, change, and remain stable over the course of life

AGE RANGES AND INDIVIDUAL DIFFERENCES. In addition to choosing to specialize in a particular topical area, developmentalists also typically look at a particular age range. The life span is usually divided into broad age ranges: the prenatal period (the period from conception to birth), infancy and toddlerhood (birth to age 3), the preschool period (ages 3 to 6), middle childhood (ages 6 to 12), adolescence (ages 12 to 20), young adulthood (ages 20 to 40), middle adulthood (ages 40 to 65), and late adulthood (age 65 to death).

It's important to keep in mind that these broad periods—which are largely accepted by lifespan developmentalists—are social constructions. A *social construction* is a shared notion of reality, one that is widely accepted but is a function of society and culture at a given time. Consequently, the age ranges within a period—and even the periods

Table 1-1 Approaches to Lifespan Development

Orientation	Defining Characteristics	Examples of Question Asked*
Physical development	Emphasizes how the brain, nervous system, muscles, sensory capabilities, and needs for food, drink, and sleep affect behavior	• What determines the sex of a child? (2) • What are the long-term results of premature birth? (3) • What are the benefits of breast milk? (4) • What are the consequences of early or late sexual maturation? (1) • What leads to obesity in adulthood? (13) • How do adults cope with stress? (15) • What are the outward and internal signs of aging? (17) • How do we define death? (19)
Cognitive development	Emphasizes intellectual abilities, including learning, memory, problem solving, and intelligence	• What are the earliest memories that can be recalled from infancy? (5) • What are the intellectual consequences of watching television? (7) • Do spatial reasoning skills relate to music practice? (7) • Are there benefits to bilingualism? (9) • How does an adolescent's egocentrism affect his or her view of the world? (11) • Are there ethnic and racial differences in intelligence? (9) • How does creativity relate to intelligence? (13) • Does intelligence decline in late adulthood? (17)
Personality and social development	Emphasizes enduring characteristics that differentiate one person from another, and how interactions with others and social relationships grow and change over the lifetime	• Do newborns respond differently to their mothers than to others? (3) • What is the best procedure for disciplining children? (8) • When does a sense of gender identity develop? (8) • How can we promote cross-race friendships? (10) • What are the causes of adolescent suicide? (12) • How do we choose a romantic partner? (14) • Do the effects of parental divorce last into old age? (18) • Do people withdraw from others in late adulthood? (18) • What are the emotions involved in confronting death? (19)

*Numbers in parentheses indicate in which chapter the question is addressed.

themselves—are in many ways arbitrary and often culturally derived. For example, later in the book we'll discuss how the concept of childhood as a special period did not even exist during the seventeenth century; at that time, children were seen simply as miniature adults. Furthermore, while some periods have a clear-cut boundary (infancy begins with birth, the preschool period ends with entry into public school, and adolescence starts with sexual maturity), others don't.

For instance, consider the period of young adulthood, which at least in Western cultures is typically assumed to begin at age 20. That age, however, is notable only because it marks the end of the teenage period. In fact, for many people, such as those enrolled in higher education, the age change from 19 to 20 has little special significance, coming as it does in the middle of the college years. For them, more substantial changes may occur when they leave college and enter the workforce, which is more likely to happen around age 22. Furthermore, in some non-Western cultures, adulthood may be considered to start much earlier, when children whose educational opportunities are limited begin full-time work.

This wedding of two children in India is an example of how environmental factors can play a significant role in determining the age when a particular event is likely to occur.

In fact, some developmentalists have proposed entirely new developmental periods. For instance, psychologist Jeffrey Arnett argues that adolescence extends into *emerging adulthood*, a period beginning in the late teenage years and continuing into the mid-twenties. During emerging adulthood, people are no longer adolescents, but they haven't fully taken on the responsibilities of adulthood. Instead, they are still trying out different identities and engage in self-focused exploration (Arnett, 2010, de Dios, 2012; Sumner, Burrow, & Hill, 2015).

In short, there are substantial *individual differences* in the timing of events in people's lives. In part, this is a biological fact of life: People mature at different rates and reach developmental milestones at different points. However, environmental factors also play a significant role in determining the age at which a particular event is likely to occur. For example, the typical age of marriage varies substantially from one culture to another, depending in part on the functions that marriage plays in a given culture.

It is important to keep in mind, then, that when developmental specialists discuss age ranges, they are talking about averages—the times when people, on average, reach

particular milestones. Some people will reach the milestone earlier, some later, and many will reach it around the time of the average. Such variation becomes noteworthy only when children show substantial deviation from the average. For example, parents whose child begins to speak at a much later age than average might decide to have their son or daughter evaluated by a speech therapist.

THE LINKS BETWEEN TOPICS AND AGES. Each of the broad topical areas of lifespan development—physical, cognitive, social, and personality development—plays a role throughout the life span. Consequently, some developmental experts focus on physical development during the prenatal period, and others during adolescence. Some might specialize in social development during the preschool years, while others look at social relationships in late adulthood. Still others might take a broader approach, looking at cognitive development through every period of life.

In this book, we'll take a comprehensive approach, proceeding chronologically from the prenatal period through late adulthood and death. Within each period, we'll look at different topical areas: physical, cognitive, social, and personality. Furthermore, we'll also be considering the impact of culture on development, as we discuss next.

Influences on Development

LO 1.3 Describe some of the basic influences on human development.

Bob, born in 1947, is a baby boomer; he was born soon after the end of World War II, when an enormous bulge in the birth rate occurred as soldiers returned to the United States from overseas. He was an adolescent at the height of the civil rights movement and the beginning of protests against the Vietnam War. His mother, Leah, was born in 1922; she is part of the generation that passed its childhood and teenage years in the shadow of the Great Depression. Bob's son, Jon, was born in 1975. Now building a career after graduating from college and starting his own family, he is a member of what has been called Generation X. Jon's younger sister, Sarah, who was born in 1982, is part of the next generation, which sociologists have called the Millennial Generation.

These people are, in part, products of the social times in which they live. Each belongs to a particular **cohort**, a group of people born at around the same time in the same place. Such major social events as wars, economic upturns and depressions, famines, and epidemics (like the one due to the AIDS virus) work similar influences on members of a particular cohort (Mitchell, 2002; Dittmann, 2005; Twenge, Gentile, & Campbell, 2015).

cohort
a group of people born at around the same time in the same place

Cohort effects provide an example of *history-graded influences*, which are biological and environmental influences associated with a particular historical moment. For instance, people who lived in New York City during the 9/11 terrorist attack on the World Trade Center experienced shared biological and environmental challenges due to the attack (Bonanno et al., 2006; Laugharne, Janca, & Widiger, 2007; Park, Riley, & Snyder, 2012).

In contrast, *age-graded influences* are biological and environmental influences that are similar for individuals in a particular age group, regardless of when or where they are raised. For example, biological events such as puberty and menopause are universal events that occur at relatively the same time throughout all societies. Similarly, a sociocultural event such as entry into formal education can be considered an age-graded influence because it occurs in most cultures around age six.

From *an educator's* perspective

How would a student's cohort membership affect his or her readiness for school? For example, what would be the benefits and drawbacks of coming from a cohort in which Internet use was routine, compared with earlier cohorts prior to the appearance of the Internet?

Development is also affected by *sociocultural-graded influences*, the social and cultural factors present at a particular time for a particular individual, depending on such variables as ethnicity, social class, and subcultural membership. For example, sociocultural-graded influences will be considerably different for children who are white and affluent than for children who are members of a minority group and living in poverty (Rose et al., 2003).

Finally, *non-normative life events* are specific, atypical events that occur in a person's life at a time when such events do not happen to most people. For example, a child whose parents die in an automobile accident when she is six years old has experienced a significant non-normative life event.

Developmental Diversity and Your Life

How Culture, Ethnicity, and Race Influence Development

> ***Mayan mothers in Central America*** *are certain that almost constant contact between themselves and their infant children is necessary for good parenting, and they are physically upset if contact is not possible. They are shocked when they see a North American mother lay her infant down, and they attribute the baby's crying to the poor parenting of the North American. (Morelli et al., 1992)*

What are we to make of the two views of parenting expressed in this passage? Is one right and the other wrong? Probably not, if we take into consideration the cultural context in which the mothers are operating. Different cultures and subcultures have their own views of appropriate and inappropriate childrearing, just as they have different developmental goals for children (Huijbregts et al., 2009; Chen, Chen & Zheng, 2012; Eeckhaut et al., 2014).

It has become clear that in order to understand development, developmentalists must take into consideration broad cultural factors, such as an orientation toward individualism or collectivism. They must also consider finer ethnic, racial, socioeconomic, and gender differences if they are to achieve an understanding of how people change and grow throughout the life span. If developmentalists succeed in doing so, not only can they achieve a better understanding of human development, but they may be able to derive more precise applications for improving the human social condition.

Efforts to understand how diversity affects development have been hindered by difficulties in finding an appropriate vocabulary. For example, members of the research community—as well as society at large—have sometimes used terms such as *race* and *ethnic group* in inappropriate ways. *Race* is a biological concept, which should be employed to refer to classifications based on physical and structural characteristics of species. In contrast, *ethnic group* and *ethnicity* are broader terms, referring to cultural background, nationality, religion, and language.

The concept of race has proven especially problematic. Although it formally refers to biological factors, race has taken on substantially more meanings—many of them inappropriate—that range from skin color to religion to culture. Moreover, the concept of race is exceedingly imprecise; depending on how it is defined, there are between 3 and 300 races, and no race is genetically distinct. The fact that 99.9 percent of humans' genetic makeup is identical in all humans makes the question of race seem comparatively insignificant (Bamshad & Olson, 2003; Helms, Jernigan, & Mascher, 2005; Smedley & Smedley, 2005).

In addition, there is little agreement about which names best reflect different races and ethnic groups. Should the term *African American*—which has geographical and cultural implications—be preferred over *black*, which focuses primarily on skin color? Is *Native American* preferable to *Indian*? Is *Hispanic* more appropriate than *Latino*? And how can researchers accurately categorize people with multiethnic backgrounds? The choice of category has important implications for the validity and usefulness of research. The choice even has political implications. For example, the decision to permit people to identify themselves as "multiracial" on U.S. government forms and in the U.S. Census initially was highly controversial (Perlmann & Waters, 2002).

In order to fully understand development, then, we need to take the complex issues associated with human diversity into account. It is only by looking for similarities and differences among various ethnic, cultural, and racial groups that developmental researchers can distinguish principles of development that are universal from principles that are culturally determined. In the years ahead, then, it is likely that lifespan development will move from a discipline that focuses primarily on North American and European development to one that encompasses development around the globe (Fowers & Davidov, 2006; Matsumoto & Yoo, 2006; Kloep et al., 2009).

Key Issues and Questions: Determining the Nature—and Nurture—of Lifespan Development

LO 1.4 Summarize four key issues in the field of lifespan development.

Lifespan development is a decades-long journey. Though there are some shared markers along the way—such as learning to speak, going to school, and finding a job—there are, as we have just seen, many individual routes with twists and turns along the way that also influence this journey.

For developmentalists working in the field, the range and variation in lifespan development raises a number of issues and questions. What are the best ways to think about the enormous changes that a person undergoes from before birth to death? How important is chronological age? Is there a clear timetable for development? How can one begin to find common threads and patterns?

These questions have been debated since lifespan development first became established as a separate field in the late nineteenth and early twentieth centuries, though a fascination with the nature and course of human development can be traced back to the ancient Egyptians and Greeks. We will look at some of these issues, which are summarized in Table 1-2.

CONTINUOUS CHANGE VERSUS DISCONTINUOUS CHANGE. One of the primary issues challenging developmentalists is whether development proceeds in a continuous or discontinuous fashion. In **continuous change**, development is gradual, with achievements at one level building on those of previous levels. Continuous change is quantitative in nature; the basic underlying developmental processes that drive change remain the same over the course of the life span. Continuous change, then, produces changes that are a matter of degree, not of kind. Changes in height prior to adulthood, for example, are continuous. Similarly, as we'll see later in the chapter, some theorists suggest that changes in people's thinking capabilities are also continuous, showing gradual quantitative improvements rather than developing entirely new cognitive processing capabilities.

continuous change
gradual development in which achievements at one level build on those of previous levels

In contrast, one can view development as being made up of primarily **discontinuous change**, occurring in distinct stages. Each stage or change brings about behavior that is assumed to be qualitatively different from behavior at earlier stages. Consider the example of cognitive development again. We'll see later in the chapter that some cognitive developmentalists suggest that as we develop, our thinking changes in fundamental ways, and that such development is not just a matter of quantitative change but of qualitative change.

discontinuous change
development that occurs in distinct steps or stages, with each stage bringing about behavior that is assumed to be qualitatively different from behavior at earlier stages

Table 1-2 Major Issues in Lifespan Development

Continuous Change	*Discontinuous Change*
• Change is gradual. • Achievements at one level build on previous level. • Underlying developmental processes remain the same over the life span.	• Change occurs in distinct steps or stages. • Behavior and processes are qualitatively different at different stages.
Critical Periods	***Sensitive Periods***
• Certain environmental stimuli are necessary for normal development. • Emphasized by early developmentalists.	• People are susceptible to certain environmental stimuli, but consequences of absent stimuli are reversible. • Current emphasis in lifespan development.
Lifespan Approach	***Focus on Particular Periods***
• Current theories emphasize growth and change throughout life, relatedness of different periods.	• Infancy and adolescence emphasized by early developmentalists as most important periods.
Nature (Genetic Factors)	***Nurture (Environmental Factors)***
• Emphasis is on discovering inherited genetic traits and abilities.	• Emphasis is on environmental influences that affect a person's development.

Most developmentalists agree that taking an either/or position on the continuous–discontinuous issue is inappropriate. While many types of developmental change are continuous, others are clearly discontinuous.

CRITICAL AND SENSITIVE PERIODS: GAUGING THE IMPACT OF ENVIRONMENTAL EVENTS. If a woman comes down with a case of rubella (German measles) in the first twenty weeks of pregnancy, the consequences for the child she is carrying are likely to be devastating: They include the potential for blindness, deafness, and heart defects. However, if she comes down with the exact same strain of rubella in the thirtieth week of pregnancy, damage to the child is unlikely.

The differing outcomes of the disease in the two periods demonstrate the concept of critical periods. A **critical period** is a specific time during development when a particular event has its greatest consequences. Critical periods occur when the presence of certain kinds of environmental stimuli is necessary for development to proceed normally (Uylings, 2006).

critical period

a specific time during development when a particular event has its greatest consequences and the presence of certain kinds of environmental stimuli is necessary for development to proceed normally

Although early specialists in lifespan development placed great emphasis on the importance of critical periods, more recent thinking suggests that in many realms, individuals are more malleable than was first thought, particularly in the domain of personality and social development. For instance, rather than suffering permanent damage from a lack of certain kinds of early social experiences, there is increasing evidence that people can use later experiences to their benefit, to help them overcome earlier deficits.

Consequently, developmentalists are now more likely to speak of sensitive periods rather than critical periods. In a **sensitive period**, organisms are particularly susceptible to certain kinds of stimuli in their environment. A sensitive period represents the optimal period for particular capacities to emerge, and children are particularly sensitive to environmental influences.

sensitive period

a point in development when organisms are particularly susceptible to certain kinds of stimuli in their environments, but the absence of those stimuli does not always produce irreversible consequences

It is important to understand the difference between the concepts of critical periods and sensitive periods. In critical periods, it is assumed that the absence of certain kinds of environmental influences is likely to produce permanent, irreversible consequences for the developing individual. In contrast, although the absence of particular environmental influences during a sensitive period may hinder development, it is possible for later experiences to overcome the earlier deficits. In other words, the concept of sensitive period recognizes the plasticity of developing humans (Armstrong, et al., 2006; Hooks & Chen, 2008; Hartley & Lee, 2015).

LIFESPAN APPROACHES VERSUS A FOCUS ON PARTICULAR PERIODS. On which part of the life span should developmentalists focus their attention? For early developmentalists, the answers tended to be infancy and adolescence. Most attention was clearly concentrated on those two periods, largely to the exclusion of other parts of the life span.

Today, the story is different. Developmentalists now believe that the entire life span is important, for several reasons. One is the discovery that developmental growth and change continue during every part of life—as we'll discuss throughout this book.

Furthermore, an important part of every person's environment is the presence of other people around him or her, the person's social environment. To fully understand the social influences on people of a given age, we need to understand the people who are in large measure providing those influences. For instance, to understand development in infants, we need to unravel the effects of their parents' ages on their social environments. A fifteen-year-old first-time mother will provide parental influences of a very different sort from those provided by an experienced thirty-seven-year-old mother. Consequently, infant development is in part an outgrowth consequence of adult development.

In addition, as lifespan developmentalist Paul Baltes points out, development across the life span involves both gains and losses. With age, certain capabilities become more refined and sophisticated, while others involve loss of skill and capacity. For example, vocabulary tends to grow throughout childhood and continues this growth through most of adulthood. At the same time, certain physical abilities, like reaction time, improve

until early and middle adulthood, when they begin to decline (Baltes, Staudinger, & Lindenberger, 1999; Baltes, 2003).

People also shift in how they invest their resources (in terms of motivation, energy, and time) at different points during the life span. Early in life, more of one's personal resources are devoted to activities involving growth, such as studying or learning new skills. As one grows older, more resources are devoted to dealing with the losses people face during late adulthood (Staudinger & Leipold, 2003).

THE RELATIVE INFLUENCE OF NATURE AND NURTURE ON DEVELOPMENT. One of the enduring questions of development involves how much of people's behavior is due to their genetically determined nature and how much is due to nurture, the influences of the physical and social environment in which a child is raised. This issue, which has deep philosophical and historical roots, has dominated much work in lifespan development (Wexler, 2006).

In this context, *nature* refers to traits, abilities, and capacities that are inherited from one's parents. It encompasses any factor that is produced by the predetermined unfolding of genetic information—a process known as **maturation**. These genetic, inherited influences are at work as we move from the one-cell organism that is created at the moment of conception to the billions of cells that make up a fully formed human. Nature influences whether our eyes are blue or brown, whether we have thick hair throughout life or eventually go bald, and how good we are at athletics. Nature allows our brains to develop in such a way that we can read the words on this page.

maturation
the predetermined unfolding of genetic information

In contrast, *nurture* refers to the environmental influences that shape behavior. Some of these influences may be biological, such as the impact of a pregnant mother's use of cocaine on her unborn child or the amount and kind of food available to children. Other environmental influences are more social, such as the ways parents discipline their children and the effects of peer pressure on an adolescent. Finally, some influences are a result of larger, societal-level factors, such as the socioeconomic circumstances in which people find themselves.

THE LATER ACTION OF NATURE AND NURTURE. If our traits and behavior were determined solely by either nature or nurture, there would probably be little debate regarding the issue. However, for most critical behaviors this is hardly the case. Take, for instance, one of the most controversial areas: intelligence. As we'll consider in detail in Chapter 9, the question of whether intelligence is determined primarily by inherited, genetic factors—nature—or is shaped by environmental factors—nurture—has caused lively and often bitter arguments that have spilled out of the scientific arena and into the realm of politics and social policy.

Consider the implications of the issue: If the extent of one's intelligence is primarily determined by heredity and consequently is largely fixed at birth, then efforts to improve intellectual performance later in life may be doomed to failure. In contrast, if intelligence is primarily a result of environmental factors, such as the amount and quality of schooling and stimulation to which one is exposed, then we would expect that an improvement in social conditions could bring about an increase in intelligence.

The extent of social policy affected by ideas about the origins of intelligence illustrates the significance of issues that involve the nature–nurture question. As we address this question in relation to several topical areas throughout this book, we should keep in mind that developmentalists reject the notion that behavior is the result solely of either nature *or* nurture. Instead, the question is one of degree—and the specifics of that, too, are hotly debated.

Furthermore, the interaction of genetic and environmental factors is complex, in part because certain genetically determined traits have not only a direct influence on children's behavior, but an indirect influence in shaping children's *environments* as well. For example, a child who is consistently cranky and who cries a great deal—a trait that may be produced by genetic factors—may influence his or her environment by making his or her

parents so highly responsive to the insistent crying that they rush to comfort the child whenever he or she cries. Their responsivity to the child's genetically determined behavior consequently becomes an environmental influence on his or her subsequent development (Bradley & Corwyn, 2008; Stright, Gallagher, & Kelley, 2008; Barnes & Boutwell, 2012).

Similarly, although our genetic background orients us toward particular behaviors, those behaviors will not necessarily occur in the absence of an appropriate environment. People with similar genetic backgrounds (such as identical twins) may behave in very different ways; and people with highly dissimilar genetic backgrounds can behave quite similarly to one another in certain areas (Coll, Bearer, & Lerner, 2004; Kato & Pedersen, 2005; Segal et al., 2015).

In sum, the question of how much of a given behavior is due to nature, and how much to nurture, is a challenging one. Ultimately, we should consider the two sides of the nature–nurture issue as opposite ends of a continuum, with particular behaviors falling somewhere between the two ends. We can say something similar about the other controversies that we have considered. For instance, continuous versus discontinuous development is not an either/or proposition; some forms of development fall toward the continuous end of the continuum, whereas others lie closer to the discontinuous end. In short, few statements about development involve either/or absolutes (Rutter, 2006; Deater-Deckard & Cahill, 2007).

Module 1.1 Review

- Lifespan development, a scientific approach to understanding human growth and change throughout life, encompasses physical, cognitive, social, and personality development.
- Developmentalists focus on physical development, cognitive development, and on personality and social development. In addition to choosing to specialize in a particular topical area, developmentalists also typically look at a particular age range.
- Membership in a cohort, based on age and place of birth, subjects people to influences based on historical events (history-graded influences). People are also subject to age-graded influences, sociocultural-graded influences, and non-normative life events. Culture and ethnicity also play an important role in development, both broad culture and aspects of culture, such as race, ethnicity, and socioeconomic status.
- Four important issues in lifespan development are continuity versus discontinuity in development, the importance of critical periods, whether to focus on certain periods or on the entire life span, and the nature–nurture controversy.

Journal Writing Prompt

Applying Lifespan Development: Give some examples of the ways culture (either broad culture or aspects of culture) affects human development.

Theoretical Perspectives on Lifespan Development

> *In Europe, there was no concept of "childhood" until the seventeenth century. Instead, children were simply thought of as miniature adults. They were assumed to be subject to the same needs and desires as adults, to have the same vices and virtues as adults, and to warrant no more privileges than adults. They were dressed the same as adults, and their work hours were the same as adults. Children also received the same punishments for misdeeds. If they stole, they were hanged; if they did well, they could achieve prosperity, at least so far as their station in life or social class would allow.*

This view of childhood seems wrong-headed now, but at the time it was what passed for lifespan development. From this perspective, there were no differences due to age; except for size, people were assumed to be virtually unchanging, at least on a psychological level, throughout most of the life span (Ariès, 1962; Acocella, 2003; Hutton, 2004; Wines, 2006).

Although, looking back over several centuries, it is easy to reject the medieval view of childhood, it is less clear how to formulate a contemporary substitute. Should our view of development focus on the biological aspects of change, growth, and stability over the life span? The cognitive or social aspects? Or some other factors?

People who study lifespan development approach the field from a number of different perspectives. Each general perspective encompasses one or more *theories*—broad, organized explanations and predictions concerning phenomena of interest. A theory provides a framework for understanding the relationships among a seemingly unorganized set of facts or principles.

Society's view of childhood, and what is appropriate to ask of children, has changed through the ages. These children worked full-time in mines in the early 1900s.

We all develop theories about development, based on our experience, folklore, and articles in magazines and newspapers. However, theories in lifespan development are different. Whereas our own personal theories are built on unverified observations that are developed haphazardly, developmentalists' theories are more formal, based on a systematic integration of prior findings and theorizing. These theories allow developmentalists to summarize and organize prior observations, and they also permit them to move beyond existing observations to draw deductions that may not be immediately apparent. In addition, these theories are then subject to rigorous testing in the form of research. By contrast, the developmental theories of individuals are not subject to such testing and may never be questioned at all (Thomas, 2001).

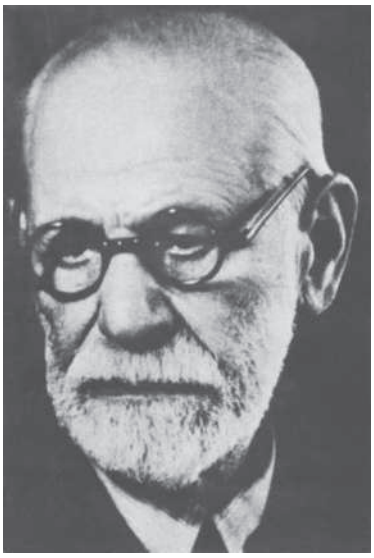
We will consider six major theoretical perspectives used in lifespan development: the psychodynamic, behavioral, cognitive, humanistic, contextual, and evolutionary perspectives. Each emphasizes somewhat different aspects of development and steers developmentalists in particular directions. Furthermore, each perspective continues to evolve and change, as befits a growing and dynamic discipline.

The Psychodynamic Perspective: Focusing on the Inner Person

LO 1.5 Describe how the psychodynamic perspective explains lifespan development.

When Marisol was six months old, she was involved in a bloody automobile accident—or so her parents tell her, since she has no conscious recollection of it. Now, however, at age 24, she is having difficulty maintaining relationships, and her therapist is seeking to determine whether her current problems are a result of the earlier accident.

Looking for such a link might seem a bit far-fetched, but to proponents of the **psychodynamic perspective**, it is not so improbable. Advocates of the psychodynamic perspective believe that much of behavior is motivated by inner forces, memories, and conflicts of which a person has little awareness or control. The inner forces, which may stem from one's childhood, continually influence behavior throughout the life span.



Sigmund Freud.

psychodynamic perspective
the approach stating that behavior is motivated by inner forces, memories, and conflicts that are generally beyond people's awareness and control

FREUD'S PSYCHOANALYTIC THEORY. The psychodynamic perspective is most closely associated with a single person and theory: Sigmund Freud and his psychoanalytic theory. Freud, who lived from 1856 to 1939, was a Viennese physician whose revolutionary ideas ultimately had a profound effect not only on the fields of psychology and psychiatry but also on Western thought in general (Masling & Bornstein, 1996; Greenberg, 2012).

psychoanalytic theory
the theory proposed by Freud that suggests that unconscious forces act to determine personality and behavior

Freud's **psychoanalytic theory** suggests that unconscious forces act to determine personality and behavior. To Freud, the *unconscious* is a part of the personality about which a person is unaware. It contains infantile wishes, desires, demands, and needs that, because of their disturbing nature, are hidden from conscious awareness. Freud suggested that the unconscious is responsible for a good part of our everyday behavior.

According to Freud, everyone's personality has three aspects: id, ego, and superego. The *id* is the raw, unorganized, inborn part of personality that is present at birth. It represents primitive drives related to hunger, sex, aggression, and irrational impulses. The id operates according to the *pleasure principle*, in which the goal is to maximize satisfaction and reduce tension.

The *ego* is the part of personality that is rational and reasonable. The ego acts as a buffer between the real world outside of us and the primitive id. The ego operates on the *reality principle*, in which instinctual energy is restrained in order to maintain the safety of the individual and help integrate the person into society.

Finally, Freud proposed that the *superego* represents a person's conscience, incorporating distinctions between right and wrong. It begins to develop around age five or six and is learned from an individual's parents, teachers, and other significant figures.

psychosexual development
according to Freud, a series of stages that children pass through in which pleasure, or gratification, focuses on a particular biological function and body part

In addition to providing an account of the various parts of the personality, Freud also suggested the ways in which personality developed during childhood. He argued that **psychosexual development** occurs as children pass through a series of stages in which pleasure, or gratification, is focused on a particular biological function and body part. As illustrated in Table 1-3, he suggested that pleasure shifts from the mouth (the *oral stage*) to the anus (the *anal stage*) and eventually to the genitals (the *phallic stage* and the *genital stage*).

According to Freud, if children are unable to gratify themselves sufficiently during a particular stage, or conversely, if they receive too much gratification, fixation may occur.

Table 1-3 Freud's and Erikson's Theories

Approximate Age	Freud's Stages of Psychosexual Development	Major Characteristics of Freud's Stages	Erikson's Stages of Psychosocial Development	Positive and Negative Outcomes of Erikson's Stages
Birth to 12–18 months	Oral	Interest in oral gratification from sucking, eating, mouthing, biting	Trust vs. mistrust	*Positive:* Feelings of trust from environmental support *Negative:* Fear and concern regarding others
12–18 months to 3 years	Anal	Gratification from expelling and withholding feces; coming to terms with society's controls relating to toilet training	Autonomy vs. shame and doubt	*Positive:* Self-sufficiency if exploration is encouraged *Negative:* Doubts about self, lack of independence
3 to 5–6 years	Phallic	Interest in the genitals; coming to terms with Oedipal conflict, leading to identification with same-sex parent	Initiative vs. guilt	*Positive:* Discovery of ways to initiate actions *Negative:* Guilt from actions and thoughts
5–6 years to adolescence	Latency	Sexual concerns largely unimportant	Industry vs. inferiority	*Positive:* Development of sense of competence *Negative:* Feelings of inferiority, no sense of mastery
Adolescence to adulthood (Freud) Adolescence (Erikson)	Genital	Reemergence of sexual interests and establishment of mature sexual relationships	Identity vs. role diffusion	*Positive:* Awareness of uniqueness of self, knowledge of role to be followed *Negative:* Inability to identify appropriate roles in life
Early adulthood (Erikson)			Intimacy vs. isolation	*Positive:* Development of loving, sexual relationships and close friendships *Negative:* Fear of relationships with others
Middle adulthood (Erikson)			Generativity vs. stagnation	*Positive:* Sense of contribution to continuity of life *Negative:* Trivialization of one's activities
Late adulthood (Erikson)			Ego-integrity vs. despair	*Positive:* Sense of unity in life's accomplishments *Negative:* Regret over lost opportunities of life

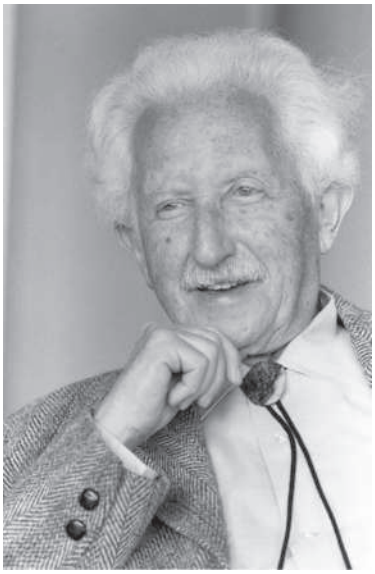
Fixation is behavior reflecting an earlier stage of development due to an unresolved conflict. For instance, fixation at the oral stage might produce an adult who is unusually absorbed in oral activities—eating, talking, or chewing gum. Freud also argued that fixation is represented through symbolic sorts of oral activities, such as the use of "biting" sarcasm.

ERIKSON'S PSYCHOSOCIAL THEORY. Psychoanalyst Erik Erikson, who lived from 1902 to 1994, provided an alternative psychodynamic view in his theory of psychosocial development, which emphasizes our social interaction with other people. In Erikson's view, both society and culture challenge and shape us. **Psychosocial development** encompasses changes in our interactions with and understandings of one another as well as in our knowledge and understanding of ourselves as members of society (Erikson, 1963; Dunkel, Kim, Papini, 2012; Jones et al., 2014).

psychosocial development the approach that encompasses changes in our interactions with and understandings of one another, as well as in our knowledge and understanding of ourselves as members of society

Erikson's theory suggests that developmental change occurs throughout our lives in eight distinct stages (see Table 1-1). The stages emerge in a fixed pattern and are similar for all people. Erikson argued that each stage presents a crisis or conflict that the individual must resolve. Although no crisis is ever fully resolved, making life increasingly complicated, the individual must at least address the crisis of each stage sufficiently to deal with demands made during the next stage of development.

Unlike Freud, who regarded development as relatively complete by adolescence, Erikson suggested that growth and change continue throughout the life span. For instance, as we'll discuss further in Chapter 16, Erikson suggested that during middle adulthood, people pass through the *generativity versus stagnation stage*, in which their contributions to family, community, and society can produce either positive feelings about the continuity of life or a sense of stagnation and disappointment about what they are passing on to future generations (de St. Aubin, McAdams, & Kim, 2004).



Erik Erikson.

ASSESSING THE PSYCHODYNAMIC PERSPECTIVE. It is hard for us to grasp the full significance of psychodynamic theories represented by Freud's psychoanalytic theory and Erikson's theory of psychosocial development. Freud's introduction of the notion that unconscious influences affect behavior was a monumental accomplishment, and that it seems at all reasonable to us shows how extensively the idea of the unconscious has pervaded thinking in Western cultures. In fact, work by contemporary researchers studying memory and learning suggests that we carry with us memories—of which we are not consciously aware—that have a significant impact on our behavior. The example of Marisol, who was in a car accident when she was a baby, shows one application of psychodynamically based thinking and research.

Some of the most basic principles of Freud's psychoanalytic theory have been called into question, however, because they have not been validated by subsequent research. In particular, the notion that people pass through various stages in childhood that determine their adult personalities has little definitive research support. In addition, because much of Freud's theory was based on a limited population of upper-middle-class Austrians living during a strict, puritanical era, its application to broad, multicultural populations is questionable. Finally, because Freud's theory focuses primarily on male development, it has been criticized as sexist and may be interpreted as devaluing women. For such reasons, many developmentalists question Freud's theory (Guterl, 2002; Messer & McWilliams, 2003; Schachter, 2005).

Erikson's view that development continues throughout the life span is highly important—and has received considerable support. However, the theory also has its drawbacks. Like Freud's theory, it focuses more on men's than women's development. It is also vague in some respects, making it difficult for researchers to test rigorously. And, as is the case with psychodynamic theories in general, it is difficult to make definitive predictions about a given individual's behavior using the theory. In sum, then, the psychodynamic perspective provides good descriptions of past behavior, but imprecise predictions of future behavior (Zauszniewski & Martin, 1999; de St. Aubin & McAdams, 2004).

The Behavioral Perspective: Focusing on Observable Behavior

LO 1.6 Describe how the behavioral perspective explains lifespan development.

When Elissa Sheehan was three, a large brown dog bit her, and she needed dozens of stitches and several operations. From the time she was bitten, she broke into a sweat whenever she saw a dog, and in fact never enjoyed being around any pet.

To a lifespan development specialist using the behavioral perspective, the explanation for Elissa's behavior is straightforward: She has a learned fear of dogs. Rather than looking inside the organism at unconscious processes, the **behavioral perspective** suggests that the keys to understanding development are observable behavior and outside stimuli in the environment. If we know the stimuli, we can predict the behavior. In this respect, the behavioral perspective reflects the view that nurture is more important to development than nature.

behavioral perspective
the approach suggesting that the keys to understanding development are observable behavior and outside stimuli in the environment

Behavioral theories reject the notion that people universally pass through a series of stages. Instead, people are assumed to be affected by the environmental stimuli to which they happen to be exposed. Developmental patterns, then, are personal, reflecting a particular set of environmental stimuli, and behavior is the result of continuing exposure to specific factors in the environment. Furthermore, developmental change is viewed in quantitative, rather than qualitative, terms. For instance, behavioral theories hold that advances in problem-solving capabilities as children age are largely a result of greater mental *capacities* rather than changes in the *kind* of thinking that children are able to bring to bear on a problem.

John B. Watson.

CLASSICAL CONDITIONING: STIMULUS SUBSTITUTION.

> *Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities. (Watson, 1925)*

With these words, John B. Watson, one of the first American psychologists to advocate a behavioral approach, summed up the behavioral perspective. Watson, who lived from 1878 to 1958, believed strongly that we could gain a full understanding of development by carefully studying the stimuli that composed the environment. In fact, he argued that by effectively controlling a person's environment, it was possible to produce virtually any behavior.

classical conditioning
a type of learning in which an organism responds in a particular way to a neutral stimulus that normally does not bring about that type of response

As we'll consider further in Chapter 5, **Classical conditioning** occurs when an organism learns to respond in a particular way to a neutral stimulus that normally does not evoke that type of response. For instance, if a dog is repeatedly exposed to the pairing of the sound of a bell and the presentation of meat, it may learn to react to the bell alone in the same way it reacts to the meat—by salivating and wagging its tail with excitement. Dogs don't typically respond to bells in this way; the behavior is a result of conditioning, a form of learning in which the response associated with one stimulus (food) comes to be connected to another—in this case, the bell.

The same process of classical conditioning explains how we learn emotional responses. In the case of dog-bite victim Elissa Sheehan, for instance, Watson would say that one stimulus has been substituted for another: Elissa's unpleasant experience with a particular dog (the initial stimulus) has been transferred to other dogs and to pets in general.

OPERANT CONDITIONING. In addition to classical conditioning, other types of learning also derive from the behavioral perspective. The learning approach that probably has had the greatest influence is operant conditioning. **Operant conditioning** is a form of learning in which a voluntary response is strengthened or weakened by its association with positive or negative consequences. It differs from classical conditioning in that the

operant conditioning
a form of learning in which a voluntary response is strengthened or weakened by its association with positive or negative consequences

response being conditioned is voluntary and purposeful rather than automatic (such as salivating).

In operant conditioning, formulated and championed by psychologist B. F. Skinner (1904–1990), individuals learn to act deliberately on their environments in order to bring about desired consequences (Skinner, 1975). In a sense, then, people *operate* on their environments to bring about a desired state of affairs.

Whether children and adults will seek to repeat a behavior depends on whether it is followed by reinforcement. *Reinforcement* is the process by which a stimulus is provided that increases the probability that a preceding behavior will be repeated. Hence, a student is apt to work harder in school if he or she receives good grades; workers are likely to labor harder at their jobs if their efforts are tied to pay increases; and people are more apt to buy lottery tickets if they are reinforced by winning occasionally. In addition, *punishment*, the introduction of an unpleasant or a painful stimulus or the removal of a desirable stimulus, will decrease the probability that a preceding behavior will occur in the future.

Behavior that is reinforced, then, is more likely to be repeated in the future, while behavior that receives no reinforcement or is punished is likely to be discontinued, or in the language of operant conditioning, *extinguished*. Principles of operant conditioning are used in **behavior modification**, a formal technique for promoting the frequency of desirable behaviors and decreasing the incidence of unwanted ones. Behavior modification has been used in a variety of situations, ranging from teaching severely retarded people the rudiments of language to helping people stick to diets (Matson & LoVullo, 2008; Wupperman et al., 2012; Wirth, Wabitsch & Hauner, 2014).

behavior modification
a formal technique for promoting the frequency of desirable behaviors and decreasing the incidence of unwanted ones

SOCIAL-COGNITIVE LEARNING THEORY: LEARNING THROUGH IMITATION. A five-year-old boy seriously injures his 22-month-old cousin while imitating a violent wrestling move he had seen on television. Although the infant sustained spinal cord injuries, he improved and was discharged five weeks after his hospital admission (Reuters Health eLine, 2002).

Cause and effect? We can't know for sure, but it certainly seems possible, especially looking at the situation from the perspective of social-cognitive learning theory. According to developmental psychologist Albert Bandura and colleagues, a significant amount of learning is explained by **social-cognitive learning theory**, an approach that emphasizes learning by observing the behavior of another person, called a *model* (Bandura, 1994, 2002).

social-cognitive learning theory
learning by observing the behavior of another person, called a model

According to social-cognitive learning theory, behavior is learned primarily through observation and not through trial and error, as it is with operant conditioning. We don't need to experience the consequences of a behavior ourselves to learn it. Social-cognitive learning theory holds that when we see the behavior of a model being rewarded, we are likely to imitate that behavior. For instance, in one classic experiment, children who were afraid of dogs were exposed to a model, nicknamed the "Fearless Peer," who was seen playing happily with a dog (Bandura, Grusec, & Menlove, 1967). After exposure, the children who previously had been afraid were more likely to approach a strange dog than children who had not seen the model.

What form of learning is being demonstrated in this picture?

Bandura suggests that social-cognitive learning proceeds in four steps (Bandura,

1986). First, an observer must pay attention and perceive the most critical features of a model's behavior. Second, the observer must successfully recall the behavior. Third, the observer must reproduce the behavior accurately. Finally, the observer must be motivated to learn and carry out the behavior.

From *a social worker's* perspective

How do the concepts of social learning and modeling relate to the mass media, and how might exposure to mass media influence a child's family life?

ASSESSING THE BEHAVIORAL PERSPECTIVE. Research using the behavioral perspective has made significant contributions, ranging from techniques for educating children with severe mental retardation to identifying procedures for curbing aggression. At the same time, some controversies surround the behavioral perspective. For example, although they are part of the same general behavioral perspective, classical and operant conditioning and social learning theory diverge in some basic ways. Both classical and operant conditioning present learning in terms of external stimuli and responses, in which the only important factors are the observable features of the environment. In such an analysis, people and other organisms are like inanimate "black boxes," nothing that occurs inside the box is understood—nor much cared about, for that matter.

To social learning theorists, such an analysis is an oversimplification. They argue that what makes people different from rats and pigeons is the occurrence of mental activity, in the form of thoughts and expectations. A full understanding of people's development, they maintain, cannot occur without moving beyond external stimuli and responses.

In many ways, social learning theory has come to predominate in recent decades over classical and operant conditioning theories. In fact, another perspective that focuses explicitly on internal mental activity has become enormously influential. This is the cognitive approach, which we consider next.

The Cognitive Perspective: Examining the Roots of Understanding

LO 1.7 Describe how the cognitive perspective explains lifespan development.

When three-year-old Jake is asked why it sometimes rains, he answers "so the flowers can grow." When his 11-year-old sister Lila is asked the same question, she responds "because of evaporation from the surface of the earth." And when their cousin Ajima, who is studying meteorology in graduate school, considers the same question, her extended answer includes a discussion of cumulonimbus clouds, the Coriolis effect, and synoptic charts.

To a developmental theorist using the cognitive perspective, the difference in the sophistication of the answers is evidence of a different degree of knowledge and understanding, or cognition. The **cognitive perspective** focuses on the processes that allow people to know, understand, and think about the world.

cognitive perspective
the approach that focuses on the processes that allow people to know, understand, and think about the world

The cognitive perspective emphasizes how people internally represent and think about the world. By using this perspective, developmental researchers hope to understand how children and adults process information and how their ways of thinking and understanding affect their behavior. They also seek to learn how cognitive abilities change as people develop, the degree to which cognitive development represents quantitative and qualitative growth in intellectual abilities, and how different cognitive abilities are related to one another.

PIAGET'S THEORY OF COGNITIVE DEVELOPMENT. No single person has had a greater impact on the study of cognitive development than Jean Piaget. A Swiss psychologist who lived from 1896 to 1980, Piaget proposed that all people pass in a fixed

sequence through a series of universal stages of cognitive development. He suggested that not only does the quantity of information increase in each stage, but the quality of knowledge and understanding changes as well. His focus was on the change in cognition that occurs as children move from one stage to the next (Piaget, 1952, 1962, 1983).

Although we'll consider Piaget's theory in detail beginning in Chapter 5, we can get a broad sense of it now. Piaget suggested that human thinking is arranged into *schemes*, that is, organized mental patterns that represent behaviors and actions. In infants, such schemes represent concrete behavior—a scheme for sucking, for reaching, and for each separate behavior. In older children, the schemes become more sophisticated and abstract, such as the set of skills involved in riding a bike or playing an interactive video game. Schemes are like intellectual computer software programs that direct and determine how data from the world are looked at and handled (Parker, 2005).

Piaget suggests that the growth in children's understanding of the world can be explained by the two basic principles of assimilation and accommodation. *Assimilation* is the process in which people understand an experience in terms of their current stage of cognitive development and way of thinking. Assimilation occurs when people use their current ways of thinking about and understanding the world to perceive and understand a new experience. In contrast, *accommodation* refers to changes in existing ways of thinking in response to encounters with new stimuli or events. Assimilation and accommodation work in tandem to bring about cognitive development.

Assessing Piaget's Theory. Piaget has profoundly influenced our understanding of cognitive development and is one of the towering figures in lifespan development. He provided masterful descriptions of how intellectual growth proceeds during childhood—descriptions that have stood the test of literally thousands of investigations. By and large, then, Piaget's broad view of the sequence of cognitive development is accurate.

However, the specifics of the theory, particularly in terms of change in cognitive capabilities over time, have been called into question. For instance, some cognitive skills clearly emerge earlier than Piaget suggested. Furthermore, the universality of Piaget's stages has been disputed. A growing amount of evidence suggests that the emergence of particular cognitive skills occurs according to a different timetable in non-Western cultures. And in every culture, some people never seem to reach Piaget's highest level of cognitive sophistication: formal, logical thought (McDonald & Stuart-Hamilton, 2003; Genovese, 2006; De Jesus-Zayas, Buigas, & Denney, 2012).

Ultimately, the greatest criticism leveled at the Piagetian perspective is that cognitive development is not necessarily as discontinuous as Piaget's stage theory suggests. Remember that Piaget argued that growth proceeds in four distinct stages in which the quality of cognition differs from one stage to the next. However, many developmental researchers argue that growth is considerably more continuous. These critics have suggested an alternative perspective, known as the information processing approach, which focuses on the processes that underlie learning, memory, and thinking throughout the life span.

INFORMATION PROCESSING APPROACHES. Information processing approaches have become an important alternative to Piagetian approaches. **Information processing approaches** to cognitive development seek to identify the ways individuals take in, use, and store information.

information processing approaches
models that seek to identify the ways individuals take in, use, and store information

Information processing approaches grew out of developments in the electronic processing of information, particularly as carried out by computers. They assume that even complex behavior such as learning, remembering, categorizing, and thinking can be broken down into a series of individual, specific steps.

Like computers, children are assumed by information processing approaches to have limited capacity for processing information. As they develop, however, they employ increasingly sophisticated strategies that allow them to process information more efficiently.

In stark contrast to Piaget's view that thinking undergoes qualitative advances as children age, information processing approaches assume that development is marked more by quantitative advances. Our capacity to handle information changes with age, as does our processing speed and efficiency. Furthermore, information processing approaches suggest that as we age, we are better able to control the nature of processing and that we can change the strategies we use to process information.

An information processing approach that builds on Piaget's research is known as neo-Piagetian theory. In contrast to Piaget's original work, which viewed cognition as a single system of increasingly sophisticated general cognitive abilities, *neo-Piagetian theory* considers cognition as being made up of different types of individual skills. Using the terminology of information processing approaches, neo-Piagetian theory suggests that cognitive development proceeds quickly in certain areas and more slowly in others. For example, reading ability and the skills needed to recall stories may progress sooner than the sorts of abstract computational abilities used in algebra or trigonometry. Furthermore, neo-Piagetian theorists believe that experience plays a greater role in advancing cognitive development than traditional Piagetian approaches claim (Case, Demetriou, & Platsidou, 2001; Yan & Fischer, 2002; Loewen, 2006).

Assessing Information Processing Approaches. As we'll see in future chapters, information processing approaches have become a central part of our understanding of development. At the same time, they do not offer a complete explanation for behavior. For example, information processing approaches have paid little attention to behavior such as creativity, in which the most profound ideas often are developed in a seemingly nonlogical, nonlinear manner. In addition, they do not take into account the social context in which development takes place. That's one of the reasons that theories emphasizing the social and cultural aspects of development have become increasingly popular—as we'll discuss next.

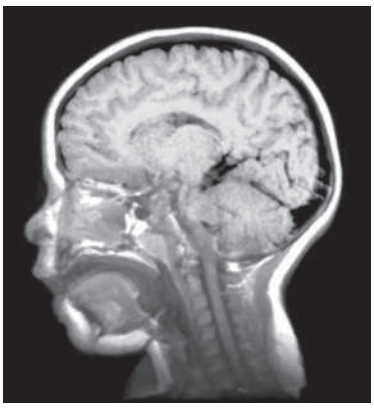
cognitive neuroscience approaches
approaches that examine cognitive development through the lens of brain processes

COGNITIVE NEUROSCIENCE APPROACHES. One of the most recent additions to the array of approaches taken by lifespan developmentalists, **cognitive neuroscience approaches** look at cognitive development through the lens of brain processes. Like other cognitive perspectives, cognitive neuroscience approaches consider internal, mental processes, but they focus specifically on the neurological activity that underlies thinking, problem solving, and other cognitive behavior.

Cognitive neuroscientists seek to identify actual locations and functions within the brain that are related to different types of cognitive activity rather than simply assuming that there are hypothetical or theoretical cognitive structures related to thinking. For example, using sophisticated brain scanning techniques, cognitive neuroscientists have demonstrated that thinking about the meaning of a word activates different areas of the brain than thinking about how the word sounds when spoken.

Figure 1-1 The Autistic Brain

Neuroscientists have found that the brain of an individual with autism is larger than the brain of an individual without autism. This finding might help identify the disorder early so that proper health care can be provided.



The work of cognitive neuroscientists is also providing clues to the cause of *autism*, a major developmental disability that can produce profound language deficits and self-injurious behavior in young children. For example, neuroscientists have found that the brains of children with the disorder show explosive, dramatic growth in the first year of life, making their heads significantly larger than those of children without the disorder (see Figure 1-1). By identifying children with the disorder very early in their lives, health-care providers can provide crucial early intervention (Nadel & Poss, 2007; Lewis & Elman, 2008; Howard et al., 2014).

Cognitive neuroscience approaches are also on the forefront of cutting-edge research that has identified specific genes associated with disorders ranging from physical problems such as breast cancer to psychological disorders such as schizophrenia. Identifying the genes that make one vulnerable to such disorders is the first step in genetic engineering in which gene therapy can reduce or even prevent the disorder from occurring (Strobel et al., 2007; Ranganath, Minzenberg, & Ragland, 2008; Rodnitzky, 2012).

Assessing Cognitive Neuroscience Approaches. Cognitive neuroscience approaches represent a new frontier in child and adolescent development. Using sophisticated

measurement techniques that many of them developed only in the last few years, cognitive neuroscientists are able to peer into the inner functioning of the brain. Advances in our understanding of genetics also has opened a new window into both normal and abnormal development and has suggested a variety of treatments for abnormalities.

Critics of the cognitive neuroscience approach have suggested that it sometimes provides a better *description* than *explanation* of developmental phenomena. For instance, the finding that children with autism have larger brains than those without the disorder does not explain why their brains became larger—that's a question that remains to be answered. Still, such work not only offers important clues to appropriate treatments but ultimately can also lead to a full understanding of a range of developmental phenomena.

The Humanistic Perspective: Concentrating on the Unique Qualities of Human Beings

LO 1.8 Describe how the humanistic perspective explains lifespan development.

The unique qualities of humans are the central focus of the humanistic perspective, the fourth of the major theories used by lifespan developmentalists. Rejecting the notion that our behavior is largely determined by unconscious processes, by learning from our environment, or by rational cognitive processing, the **humanistic perspective** contends that people have a natural capacity to make decisions about their lives and to control their behavior. According to this approach, each individual has the ability and motivation to reach more advanced levels of maturity, and people naturally seek to reach their full potential.

humanistic perspective
the theory contending that people have a natural capacity to make decisions about their lives and control their behavior

The humanistic perspective emphasizes *free will*, the ability of humans to make choices and come to decisions about their lives. Instead of relying on societal standards, then, people are assumed to be motivated to make their own decisions about what they do with their lives.

Carl Rogers, one of the major proponents of the humanistic perspective, suggested that all people have a need for positive regard that results from an underlying wish to be loved and respected. Because it is other people who provide this positive regard, we become dependent on them. Consequently, our view of ourselves and our self-worth is a reflection of how we think others view us (Rogers, 1971; Motschnig & Nykl, 2003).

Rogers, along with another key figure in the humanistic perspective, Abraham Maslow, suggests that self-actualization is a primary goal in life. *Self-actualization* is a state of self-fulfillment in which people achieve their highest potential in their own unique way. Although the concept initially was deemed to apply to only a few select, famous people, such as Eleanor Roosevelt, Abraham Lincoln, and Albert Einstein, later theorists expanded the concept to apply to any person who realizes his or her own potential and possibilities (Maslow, 1970; Sheldon, Joiner, & Pettit, 2003; Malchiodi, 2012).

ASSESSING THE HUMANISTIC PERSPECTIVE. Despite its emphasis on important and unique human qualities, the humanistic perspective has not had a major impact on the field of lifespan development. Its lack of influence is primarily due to its inability to identify any sort of broad developmental change that is the result of increasing age or experience. Still, some of the concepts drawn from the humanistic perspective, such as self-actualization, have helped describe important aspects of human behavior and are widely discussed in areas ranging from health care to business (Zalenski & Raspa, 2006; Elkins, 2009; Beitel et al., 2014).

The Contextual Perspective: Taking a Broad Approach to Development

LO 1.9 Describe how the contextual perspective explains lifespan development.

Although lifespan developmentalists often consider the course of development separately in terms of physical, cognitive, personality, and social factors, such a categorization has one serious drawback: In the real world, none of these broad influences occurs

in isolation from any other. Instead, there is a constant, ongoing interaction between the different types of influence.

contextual perspective
the theory that considers the relationship between individuals and their physical, cognitive, personality, and social worlds

The **contextual perspective** considers the relationship between individuals and their physical, cognitive, personality, and social worlds. It suggests that a person's unique development cannot be properly viewed without seeing how that person is enmeshed within a rich social and cultural context. We'll consider two major theories that fall under this category, Bronfenbrenner's bioecological approach and Vygotsky's sociocultural theory.

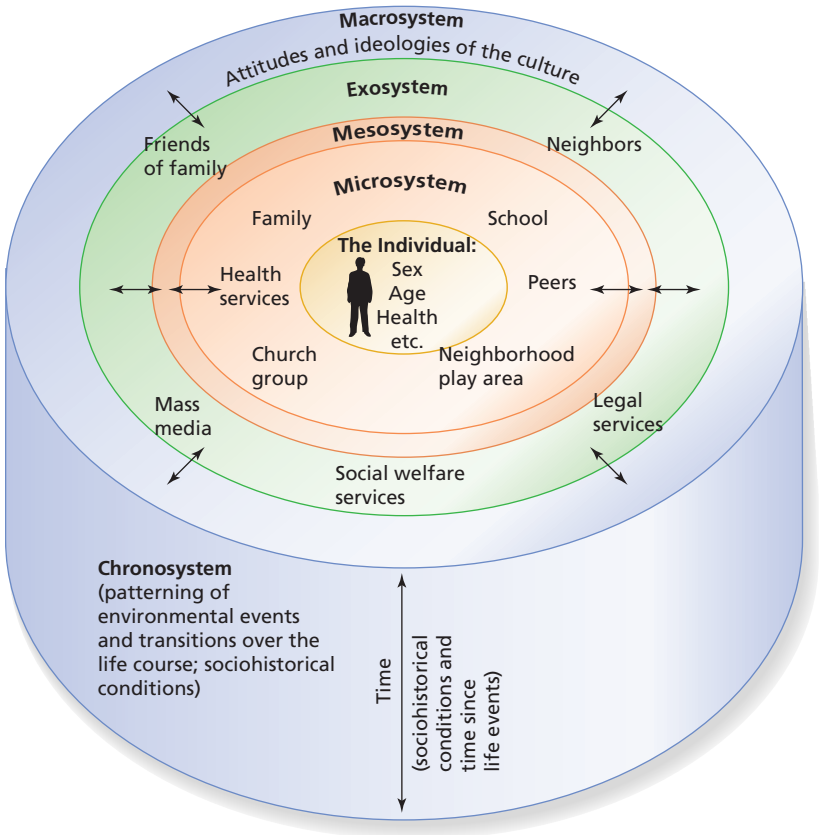
THE BIOECOLOGICAL APPROACH TO DEVELOPMENT. In acknowledging the problem with traditional approaches to lifespan development, psychologist Urie Bronfenbrenner (1989, 2000, 2002) has proposed an alternative perspective, called the bioecological approach. The **bioecological approach** suggests that five levels of the environment simultaneously influence individuals. Bronfenbrenner notes that we cannot fully understand development without considering how a person is influenced by each of these levels (illustrated in Figure 1-2).

bioecological perspective
the perspective suggesting that different levels of the environment simultaneously influence individuals

- The *microsystem* is the everyday, immediate environment in which children lead their daily lives. Homes, caregivers, friends, and teachers all are influences that are part of the microsystem. But the child is not just a passive recipient of these influences. Instead, children actively help construct the microsystem, shaping the immediate world in which they live. The microsystem is the level at which most traditional work in child development has been directed.
- The *mesosystem* provides connections between the various aspects of the microsystem. Like links in a chain, the mesosystem binds children to parents, students to teachers,

Figure 1-2 Bronfenbrenner's Approach to Development

Urie Bronfenbrenner's bioecological approach to development offers five levels of the environment that simultaneously influence individuals: the macrosystem, exosystem, mesosystem, and microsystem.



employees to bosses, and friends to friends. It acknowledges the direct and indirect influences that bind us to one another, such as those that affect a mother or father who has a bad day at the office and then is short-tempered with her or his son or daughter at home.

- The *exosystem* represents broader influences, encompassing societal institutions such as local government, the community, schools, places of worship, and the local media. Each of these larger institutions of society can have an immediate, and major, impact on personal development, and each affects how the microsystem and mesosystem operate. For example, the quality of a school will affect a child's cognitive development and potentially can have long-term consequences.
- The *macrosystem* represents the larger cultural influences on an individual. Society in general, types of governments, religious and political value systems, and other broad, encompassing factors are parts of the macrosystem. For example, the value a culture or society places on education or the family will affect the values of the people who live in that society. Children are part of both a broader culture (such as Western culture) and are influenced by their membership in a particular subculture (for instance, being part of the Mexican American subculture).
- Finally, the *chronosystem* underlies each of the previous systems. It involves the way the passage of time, including historical events (such as the terrorist attacks in September of 2001) and more gradual historical changes (such as changes in the number of women who work outside of the home), affect children's development.

The bioecological approach emphasizes the *interconnectedness of the influences on development.* Because the various levels are related to one another, a change in one part of the system affects other parts of the system. For instance, a parent's loss of a job (involving the mesosystem) has an impact on a child's microsystem.

Conversely, changes on one environmental level may make little difference if other levels are not also changed. For instance, improving the school environment may have a negligible effect on academic performance if children receive little support for academic success at home. Similarly, the bioecological approach illustrates that the influences among different family members are multidirectional. Parents don't just influence their child's behavior—the child also influences the parents' behavior.

Finally, the bioecological approach stresses the importance of broad cultural factors that affect development. Researchers in lifespan development increasingly look at how membership in cultural and subcultural groups influences behavior.

Consider, for instance, whether you agree that children should be taught that their classmates' assistance is indispensable to getting good grades in school, or that they should definitely plan to continue their fathers' businesses, or that children should follow their parents' advice in determining their career plans. If you have been raised in the most widespread North American culture, you would likely disagree with all three statements, since they violate the premises of *individualism*, the dominant Western philosophy that emphasizes personal identity, uniqueness, freedom, and the worth of the individual.

On the other hand, if you were raised in a traditional Asian culture, your agreement with the three statements would be considerably more likely. The reason? The statements reflect the value orientation known as *collectivism*—the notion that the well-being of the group is more important than that of the individual. People raised in collectivistic cultures tend to emphasize the welfare of the groups to which they belong, sometimes even at the expense of their own personal well-being.

The individualism–collectivism spectrum is one of several dimensions along which cultures differ, and it illustrates differences in the cultural contexts in which people operate. Such broad cultural values play an important role in shaping the ways people view the world and behave (Leung, 2005; Garcia & Saewyc, 2007; Yu & Stiffman, 2007).

The bioecological approach to development focuses on the vast differences in environments in which children develop.

Assessing the Bioecological Approach. Although Bronfenbrenner considers biological influences as an important component of the bioecological approach, ecological influences are central to the theory. Some critics argue that the perspective pays insufficient attention to biological factors. Still, the bioecological approach is of considerable importance to child development, suggesting as it does the multiple levels at which the environment affects children's development.

VYGOTSKY'S SOCIOCULTURAL THEORY. To Russian developmentalist Lev Semenovich Vygotsky, a full understanding of development was impossible without taking into account the culture in which people develop. Vygotsky's **sociocultural theory** emphasizes how cognitive development proceeds as a result of social interactions between members of a culture (Vygotsky, 1926/1997, 1979; Edwards, 2005; Göncü & Gauvain, 2012).

sociocultural theory
the approach that emphasizes how cognitive development proceeds as a result of social interactions between members of a culture

Vygotsky, who lived a brief life from 1896 to 1934, argued that children's understanding of the world is acquired through their problem-solving interactions with adults and other children. As children play and cooperate with others, they learn what is important in their society and, at the same time, advance cognitively in their understanding of the world. Consequently, to understand the course of development, we must consider what is meaningful to members of a given culture.

According to Vygotsky, children can develop cognitively in their understanding of the world, and learn what is important in society, through play and cooperation with others.

More than most other theories, sociocultural theory emphasizes that development is a *reciprocal transaction* between the people in a child's environment and the child. Vygotsky believed that people and settings influence the child, who in turn influences the people and settings. This pattern continues in an endless loop, with children being both recipients of socialization influences and sources of influence. For example, a child raised with his or her extended family nearby will grow up with a different sense of family life than a child whose relatives live a considerable distance away. Those relatives, too, are affected by that situation and that child, depending on how close and frequent their contact is with the child.

Assessing Vygotsky's Theory. Sociocultural theory has become increasingly influential, despite

Vygotsky's death almost eight decades ago. The reason is the growing acknowledgment of the central importance of cultural factors in development. Children do not develop in a cultural vacuum. Instead, their attention is directed by society to certain areas, and as a consequence, they develop particular kinds of skills that are an outcome of their cultural environment. Vygotsky was one of the first developmentalists to recognize and acknowledge the importance of culture, and—as today's society becomes increasingly multicultural—sociocultural theory is helping us to understand the rich and varied influences that shape development (Koshmanova, 2007; Rogan, 2007; Frie, 2014).

Sociocultural theory is not without its critics, however. Some suggest that Vygotsky's strong emphasis on the role of culture and social experience led him to ignore the effects of biological factors on development. In addition, his perspective seems to minimize the role that individuals can play in shaping their own environment. As we can see from the emphasis of the humanistic perspective, each individual can play a central role in determining the course of his or her own development.

Evolutionary Perspectives: Our Ancestors' Contributions to Behavior

LO 1.10 Describe how the evolutionary perspective explains lifespan development.

One increasingly influential approach is the evolutionary perspective, the sixth and final developmental perspective that we will consider. The **evolutionary perspective** seeks to identify behavior that is the result of our genetic inheritance from our ancestors (Bjorklund, 2005; Goetz & Shackelford, 2006).

evolutionary perspective
the theory that seeks to identify behavior that is a result of our genetic inheritance from our ancestors

Evolutionary approaches have grown out of the groundbreaking work of Charles Darwin. In 1859, Darwin argued in his book *On the Origin of Species* that a process of natural selection creates traits in a species that are adaptive to its environment. Using Darwin's arguments, evolutionary approaches contend that our genetic inheritance determines not only such physical traits as skin and eye color, but certain personality traits and social behaviors as well. For instance, some evolutionary developmentalists suggest that behaviors such as shyness and jealousy are produced in part by genetic causes, presumably because they helped increase the survival rates of humans' ancient relatives (Easton, Schipper, & Shackelford, 2007; Buss, 2003, 2009, 2012).

The evolutionary perspective draws heavily on the field of *ethology*, which examines the ways in which our biological makeup influences our behavior. A primary proponent of ethology was Konrad Lorenz (1903–1989), who discovered that newborn geese are genetically preprogrammed to become attached to the first moving object they see after birth. His work, which demonstrated the importance of biological determinants in influencing behavior patterns, ultimately led developmentalists to consider the ways in which human behavior might reflect inborn genetic patterns.

Konrad Lorenz, seen here with geese who from their birth have followed him, considered the ways in which behavior reflects inborn genetic patterns.

As we'll consider further in Chapter 2, the evolutionary perspective encompasses one of the fastest growing areas within the field of lifespan development: behavioral genetics. *Behavioral genetics* studies the effects of heredity on behavior. Behavioral geneticists seek to understand how we might inherit certain behavioral traits and how the environment influences whether we actually display such traits. It also considers how genetic factors may produce psychological disorders such as schizophrenia (Li, 2003; Bjorklund & Ellis, 2005; Rembis, 2009).

ASSESSING THE EVOLUTIONARY PERSPECTIVE. There is little argument among lifespan developmentalists that Darwin's evolutionary theory provides an accurate description of basic genetic processes, and the evolutionary perspective is increasingly visible in the field of lifespan development. However, applications of the evolutionary perspective have been subjected to considerable criticism.

Some developmentalists are concerned that because of its focus on genetic and biological aspects of behavior, the evolutionary perspective pays insufficient attention to the environmental and social factors involved in producing children's and adults' behavior. Other critics argue that there is no good way to experimentally test theories derived from the evolutionary approach because they all happened so long ago. For example, it is one thing to say that jealousy helped individuals to survive more effectively and another thing to prove it. Still, the evolutionary approach has stimulated a significant amount of research on how our biological inheritance at least partially influences our traits and behaviors (Bjorklund, 2006; Baptista et al., 2008; Del Giudice, 2015).

Why "Which Approach Is Right?" Is the Wrong Question

LO 1.11 Discuss the value of applying multiple perspectives to lifespan development.

WATCH THIS VIDEO ON MYPSYCHLAB THINKING LIKE A PSYCHOLOGIST: EVOLUTIONARY PSYCHOLOGY

We have considered the six major perspectives used in lifespan development—psychodynamic, behavioral, cognitive, humanistic, contextual, and evolutionary. These perspectives are summarized in Table 1-4 and are applied to the case of a young adult who is overweight. It would be natural to wonder which of the six provides the most accurate account of human development.

For several reasons, this question is not entirely appropriate. For one thing, each perspective emphasizes somewhat different aspects of development. For instance, the psychodynamic approach emphasizes emotions, motivational conflicts, and unconscious determinants of behavior. In contrast, behavioral perspectives emphasize overt behavior, paying far more attention to what people *do* than to what goes on inside their heads, which is deemed largely irrelevant. The cognitive and humanistic perspectives take quite the opposite

Table 1-4 Major Perspectives on Lifespan Development

Perspective	Key Ideas About Human Behavior and Development	Major Proponents	Example
Psychodynamic	Behavior throughout life is motivated by inner, unconscious forces, stemming from childhood, over which we have little control.	Sigmund Freud, Erik Erikson	This view might suggest that a young adult who is overweight has a fixation in the oral stage of development.
Behavioral	Development can be understood through studying observable behavior and environmental stimuli.	John B. Watson, B. F. Skinner, Albert Bandura	In this perspective, a young adult who is overweight might be seen as not being rewarded for good nutritional and exercise habits.
Cognitive	Emphasis on how changes or growth in the ways people know, understand, and think about the world affect behavior.	Jean Piaget	This view might suggest that a young adult who is overweight hasn't learned effective ways to stay at a healthy weight and doesn't value good nutrition.
Humanistic	Behavior is chosen through free will and motivated by our natural capacity to strive to reach our full potential.	Carl Rogers, Abraham Maslow	In this view, a young adult who is overweight may eventually choose to seek an optimal weight as part of an overall pattern of individual growth.
Contextual	Development should be viewed in terms of the interrelationship of a person's physical, cognitive, personality, and social worlds.	Urie Bronfenbrenner, Lev Vygotsky	In this perspective, being overweight is caused by a number of interrelated factors in that person's physical, cognitive, personality, and social worlds.
Evolutionary	Behavior is the result of genetic inheritance from our ancestors; traits and behavior that are adaptive for promoting the survival of our species have been inherited through natural selection.	Influenced by early work of Charles Darwin, Konrad Lorenz	This view might suggest that a young adult might have a genetic tendency toward obesity because extra fat helped his or her ancestors to survive in times of famine.

tack, looking more at what people *think* than at what they do. Finally, the evolutionary perspective focuses on how inherited biological factors underlie development.

For example, a developmentalist using the psychodynamic approach might consider how the 9/11 terrorist attacks on the World Trade Center and Pentagon might affect children, unconsciously, for their entire life span. A cognitive approach might focus on how children perceived and came to interpret and understand terrorism, while a contextual approach might consider what personality and social factors led the perpetrators to adopt terrorist tactics.

Clearly, each perspective is based on its own premises and focuses on different aspects of development. Furthermore, the same developmental phenomenon can be looked at from a number of perspectives simultaneously. In fact, some lifespan developmentalists use an *eclectic* approach, drawing on several perspectives simultaneously.

We can think of the different perspectives as analogous to a set of maps of the same general geographical area. One map may contain detailed depictions of roads; another map may show geographical features; another may show political subdivisions, such as cities, towns, and counties; and still another may highlight particular points of interest, such as scenic areas and historical landmarks. Each of the maps is accurate, but each provides a different point of view and way of thinking. Although no one map is "complete," by considering them together, we can come to a fuller understanding of the area.

The various theoretical perspectives provide different ways of looking at development. Considering them together paints a fuller portrait of the myriad ways human beings change and grow over the course of their lives. However, not all theories and claims derived from the various perspectives are accurate. How do we choose among competing explanations? The answer is *research*, which we consider in the final part of this chapter.

Module 1.2 Review

- The psychodynamic perspective looks primarily at the influence of internal, unconscious forces on development.
- The behavioral perspective focuses on external, observable behaviors as the key to development.
- The cognitive perspective focuses on the processes that allow people to know, understand, and think about the world.
- The humanistic perspective concentrates on the theory that each individual has the ability and motivation to reach more advanced levels of maturity and that people naturally seek to reach their full potential.
- The contextual perspective focuses on the relationship between individuals and the social context in which they lead their lives.
- The evolutionary perspective seeks to identify behavior that is a result of our genetic inheritance from our ancestors.
- The various theoretical perspectives provide different ways of looking at development. An eclectic approach paints a more complete picture of the ways humans change over the life span.

Journal Writing Prompt

Applying Lifespan Development: What examples of human behavior have you seen that seem to have been inherited from our ancestors because they helped individuals survive and adapt more effectively? Why do you think they are inherited?

Research Methods

The Greek historian Herodotus wrote of an experiment conducted by Psamtik, the King of Egypt, in the seventh century B.C. Psamtik was eager to prove a cherished Egyptian belief, that his people were the oldest race on earth. To test this notion, he developed a hypothesis: If a child was never exposed to the language of his elders, he would instinctively adopt the primal language of humanity—the original language of the first people. Psamtik was certain this would be Egyptian.

For his experiment, Psamtik entrusted two Egyptian infants to the care of a herdsman in an isolated area. They were to be well looked after but not allowed to leave their cottage. And they were never to hear anyone speak a single word.

When Herodotus investigated the story, he learned that Psamtik sought to learn what the first word the children would say. Herodotus claims the experiment worked, but not as Psamtik had hoped. One day, when the children were two years old, they greeted the herdsman with the word "Becos!" The herdsman didn't know this word but when the children continued to use it, he contacted Psamtik. The king sent for the children who repeated the strange word to him. Psamtik did some research. Becos, it turned out, was "bread" in Phrygian. Psamtik had to conclude the Phrygians had preceded the Egyptians.

With the perspective of several thousand years, we can easily see the shortcomings—both scientific and ethical—in Psamtik's approach. Yet his procedure represents an improvement over mere speculation and as such is sometimes seen as the first developmental experiment in recorded history (Hunt, 1993).

Theories and Hypotheses: Posing Developmental Questions

LO 1.12 Describe the role that theories and hypotheses play in the study of development.

Questions such as those raised by Psamtik drive the study of development. In fact, developmentalists are still studying how children learn language. Others are trying to find answers to such questions as, What are the effects of malnutrition on later intellectual performance? How do infants form relationships with their parents, and does participation in day care disrupt such relationships? Why are adolescents particularly susceptible to peer pressure? Can mentally challenging activities reduce the declines in intellectual abilities related to aging? Do any mental faculties improve with age?

scientific method
the process of posing and answering questions using careful, controlled techniques that include systematic, orderly observation and the collection of data

To answer such questions, developmentalists, like all psychologists and other scientists, rely on the scientific method. The **scientific method** is the process of posing and answering questions using careful, controlled techniques that include systematic, orderly observation and the collection of data. The scientific method involves three major steps: (1) identifying questions of interest, (2) formulating an explanation, and (3) carrying out research that either lends support to the explanation or refutes it.

theories
explanations and predictions concerning phenomena of interest, providing a framework for understanding the relationships among an organized set of facts or principles

The scientific method involves the formulation of **theories**, the broad explanations and predictions about phenomena of interest that scientists create. For instance, many people theorize that a crucial bonding period between parent and child takes place immediately after birth, which is a necessary ingredient in forming a lasting parent–child relationship. Without such a bonding period, they assume, the parent–child relationship will be forever compromised (Furnham & Weir, 1996).

hypothesis
a prediction stated in a way that permits it to be tested

Developmental researchers use theories to form hypotheses. A **hypothesis** is a prediction stated in a way that permits it to be tested. For instance, someone who subscribes to the general theory that bonding is a crucial ingredient in the parent–child relationship might derive the more specific hypothesis that adopted children whose adoptive parents never had the chance to bond with them immediately after birth may ultimately have less secure relationships with their adoptive parents. Others might derive other hypotheses, such as that effective bonding occurs only if it lasts for a certain length of time, or that bonding affects the mother–child relationship but not the father–child relationship. (In case you're wondering: As we'll discuss in Chapter 3, these particular hypotheses have *not* been upheld; there are no long-term reactions to the separation of parent and child immediately after birth, even if the separation lasts several days.)

Choosing a Research Strategy: Answering Questions

LO 1.13 Compare the two major categories of lifespan development research.

correlational research
research that seeks to identify whether an association or relationship between two factors exists

Once researchers have formed a hypothesis, they must develop a research strategy for testing its validity. There are two major categories of research: correlational research and experimental research. **Correlational research** seeks to identify whether an association or

relationship between two factors exists. As we'll see, correlational research cannot be used to determine whether one factor *causes* changes in the other. For instance, correlational research could tell us if there is an association between the number of minutes a mother and her newborn child are together immediately after birth and the quality of the mother–child relationship when the child reaches two years of age. Such correlational research indicates whether the two factors are *associated* or *related* to one another, but not whether the initial contact caused the relationship to develop in a particular way (Schutt, 2001).

In experimental research, one uses controlled conditions to attempt to discover causal relationships between various factors.

In contrast, **experimental research** is designed to discover *causal* relationships between various factors. In experimental research, researchers deliberately introduce a change in a carefully structured situation in order to see the consequences of that change. For instance, a researcher conducting an experiment might vary the number of minutes that mothers and children interact immediately following birth, in an attempt to see whether the amount of bonding time affects the mother–child relationship.

experimental research
research designed to discover causal relationships between various factors

Because experimental research is able to answer questions of causality, it is fundamental to finding answers to various developmental hypotheses. However, some research questions cannot be answered through experiments, for either technical or ethical reasons (for example, it would be unethical to design an experiment in which a group of infants was offered no chance to bond with a caregiver at all). In fact, a great deal of pioneering developmental research—such as that conducted by Piaget and Vygotsky—employed correlational techniques. Consequently, correlational research remains an important tool in the developmental researcher's toolbox.

Correlational Studies

LO 1.14 Identify different types of correlational studies and their relationship to cause and effect.

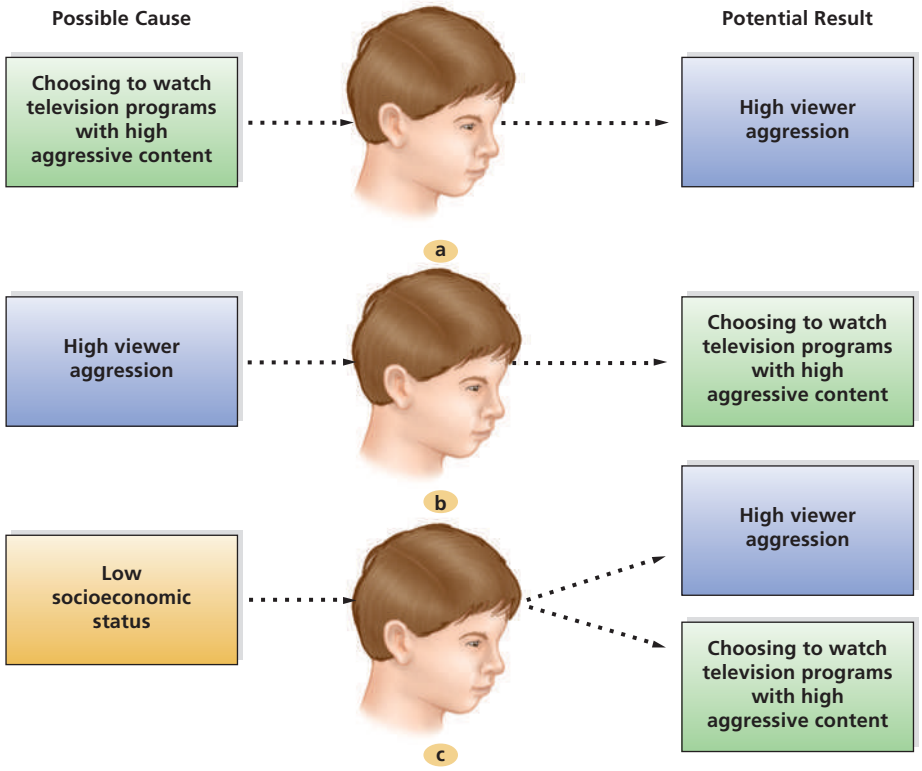
As we've noted, correlational research examines the relationship between two variables to determine whether they are associated, or *correlated*. For instance, researchers interested in the relationship between televised aggression and subsequent behavior have found that children who watch a good deal of aggression on television—murders, crime shows, shootings, and the like—tend to be more aggressive than those who watch only a little. In other words, as we'll discuss in greater detail in Chapter 15, viewing of aggression and actual aggression are strongly associated, or correlated, with one another (Center for Communication & Social Policy, 1998; Singer & Singer, 2000; Feshbach & Tangney, 2008).

But does this mean we can conclude that the viewing of televised aggression *causes* the more aggressive behavior of the viewers? Not at all. Consider some of the other possibilities: It might be that being aggressive in the first place makes children more likely to choose to watch violent programs. In such a case, then, it is the aggressive tendency that causes the viewing behavior, and not the other way around.

Or consider another possibility. Suppose that children who are raised in poverty are more likely to behave aggressively *and* to watch higher levels of aggressive television than those raised in more affluent settings. In this case, it is a third variable—low

Figure 1-3 Finding a Correlation

Finding a correlation between two factors does not imply that one factor causes the other factor to vary. For instance, suppose a study found that viewing television shows with high levels of aggression is correlated with actual aggression in children. The correlation may reflect at least three possibilities: (a) watching television programs containing high levels of aggression causes aggression in viewers; (b) children who behave aggressively choose to watch TV programs with high levels of aggression; or (c) some third factor, such as a child's socioeconomic status, leads both to high viewer aggression and to choosing to watch television programs with high levels of aggression. What other factors, besides socioeconomic status, might be plausible third factors?



socioeconomic status—that may cause *both* the aggressive behavior and the television viewing. The various possibilities are illustrated in Figure 1-3.

In short, finding that two variables are correlated proves nothing about causality. Although the variables may be linked causally, this is not necessarily the case.

Correlational studies do provide important information, however. For instance, as we'll see in later chapters, we know from correlational studies that the closer the genetic link between two people, the more highly associated is their intelligence. We have learned that the more parents speak to their young children, the more extensive are the children's vocabularies. And we know from correlational studies that the better the nutrition that infants receive, the fewer the cognitive and social problems they experience later (Hart, 2004; Colom, Lluis-Font, & Andrès-Pueyo, 2005; Robb, Richert, & Wartella, 2009).

THE CORRELATION COEFFICIENT. The strength and direction of a relationship between two factors is represented by a mathematical score, called a *correlation coefficient*, that ranges from +1.0 to −1.0. A positive correlation indicates that as the value of one factor increases, it can be predicted that the value of the other will also increase. For instance, if we find that the more money people make in their first job after college, the higher their scores on a survey of job satisfaction, and that people who make less money have lower scores when surveyed about their job satisfaction, we have found a positive

correlation. (Higher values of the factor "salary" are associated with higher values of the factor "job satisfaction," and lower values of "salary" are associated with lower values of "job satisfaction.") The correlation coefficient, then, would be indicated by a positive number, and the stronger the association between salary and job satisfaction, the closer the number would be to +1.0.

In contrast, a correlation coefficient with a negative value informs us that as the value of one factor increases, the value of the other factor declines. For example, suppose we found that the greater the number of hours adolescents spend texting, the worse their academic performance is. Such a finding would result in a negative correlation, ranging between 0 and −1. More texting would be associated with lower performance, and less texting would be associated with better performance. The stronger the association between texting and school performance, the closer the correlation coefficient would be to −1.0.

Finally, it is possible that two factors are unrelated to one another. For example, it is unlikely that we would find a correlation between school performance and shoe size. In this case, the lack of a relationship would be indicated by a correlation coefficient close to 0.

It is important to reiterate what we noted earlier: Even if the correlation coefficient involving two variables is very strong, there is no way we can know whether one factor *causes* another factor to vary. It simply means that the two factors are associated with one another in a predictable way.

TYPES OF CORRELATIONAL STUDIES. There are several types of correlational studies. **Naturalistic observation** is the observation of a naturally occurring behavior without intervention in the situation. For instance, an investigator who wishes to learn how often preschool children share toys with one another might observe a classroom over a three-week period, recording how often the preschoolers spontaneously share with one another. The key point about naturalistic observation is that the investigator simply observes the children, without interfering with the situation whatsoever (e.g., Fanger, Frankel, & Hazen, 2012; Graham et al., 2014).

naturalistic observation
a type of correlational study in which some naturally occurring behavior is observed without intervention in the situation

Though naturalistic observation has the advantage of identifying what children do in their "natural habitat," there is an important drawback to the method: Researchers are unable to exert control over factors of interest. For instance, in some cases researchers might find so few naturally occurring instances of the behavior of interest that they are unable to draw any conclusions at all. In addition, children who know they are being watched may modify their behavior as a result of the observation. Consequently, their behavior may not be representative of how they would behave if they were not being watched.

Increasingly, naturalistic observation employs *ethnography* a method borrowed from the field of anthropology and used to investigate cultural questions. In ethnography, a researcher's goal is to understand a culture's values and attitudes through careful, extended examination. Typically, researchers using ethnography act as participant observers, living for a period of weeks, months, or even years in another culture. By carefully observing everyday life and conducting in-depth interviews, researchers are able to obtain a deep understanding of the nature of life within another culture (Dyson, 2003).

Ethnographic studies are an example of a broader category of research known as qualitative research. In *qualitative research*, researchers choose particular settings of interest and seek to carefully describe, in narrative fashion, what is occurring, and why. Qualitative research can be used to generate hypotheses that can later be tested using more objective, quantitative methods.

Although ethnographic and qualitative studies provide a fine-grained view of behavior in particular settings, they suffer from several drawbacks. As mentioned, the presence of a participant observer may influence the behavior of the individuals being studied. Furthermore, because only a small number of individuals are studied, it may

be hard to generalize the findings to other settings. Finally, ethnographers carrying out cross-cultural research may misinterpret and misconceive what they are observing, particularly in cultures that are very different from their own (Polkinghorne, 2005; Hallett & Barber, 2014).

case study
study that involves extensive, in-depth interviews with a particular individual or small group of individuals

Case studies involve extensive, in-depth interviews with a particular individual or small group of individuals. They often are used not just to learn about the individual being interviewed but to derive broader principles or draw tentative conclusions that might apply to others. For example, case studies have been conducted on children who display unusual genius and on children who have spent their early years in the wild, apparently without human contact. These case studies have provided important information to researchers and have suggested hypotheses for future investigation (Goldsmith, 2000; Cohen & Cashon, 2003; Wilson, 2003).

Using *diaries*, participants are asked to keep a record of their behavior on a regular basis. For example, a group of adolescents may be asked to record each time they interact with friends for more than 5 minutes, thereby providing a way to track their social behavior.

survey research
a type of study where a group of people chosen to represent some larger population are asked questions about their attitudes, behavior, or thinking on a given topic

Surveys represent another sort of correlational research. In **survey research**, a group of people chosen to represent some larger population are asked questions about their attitudes, behavior, or thinking on a given topic. For instance, surveys have been conducted about parents' use of punishment on their children and on attitudes toward breastfeeding. From the responses, inferences are drawn regarding the larger population represented by the individuals being surveyed.

psychophysiological methods
research that focuses on the relationship between physiological processes and behavior

PSYCHOPHYSIOLOGICAL METHODS. Some developmental researchers, particularly those using a cognitive neuroscience approach, make use of psychophysiological methods. **Psychophysiological methods** focus on the relationship between physiological processes and behavior. For instance, a researcher might examine the relationship between blood flow within the brain and problem-solving capabilities. Similarly, some studies use infants'

Naturalistic observation is utilized to examine a situation in its natural habitat without interference of any sort. What are some disadvantages of naturalistic observation?

heart rate as a measure of their interest in stimuli to which they are exposed (Santesso, Schmidt, & Trainor, 2007; Field, Diego, & Hernandez-Reif, 2009; Mazoyer et al., 2009).

Among the most frequently used psychophysiological measures are the following:

- ***Electroencephalogram (EEG).*** The EEG reports electrical activity within the brain recorded by electrodes placed on the outside of the skull. That brain activity is transformed into a pictorial representation of the brain, permitting the representation of brain wave patterns and diagnosis of disorders such as epilepsy and learning disabilities.
- ***Computerized axial tomography (CAT) scan.*** In a CAT scan, a computer constructs an image of the brain by combining thousands of individual X-rays taken at slightly different angles. Although it does not show brain activity, it does illuminate the structure of the brain.
- ***Functional magnetic resonance imaging (fMRI) scan.*** An fMRI provides a detailed, three-dimensional computer-generated image of brain activity by aiming a powerful magnetic field at the brain. It offers one of the best ways of learning about the operation of the brain, down to the level of individual nerves.

Experiments: Determining Cause and Effect

LO 1.15 Explain the main features of an experiment.

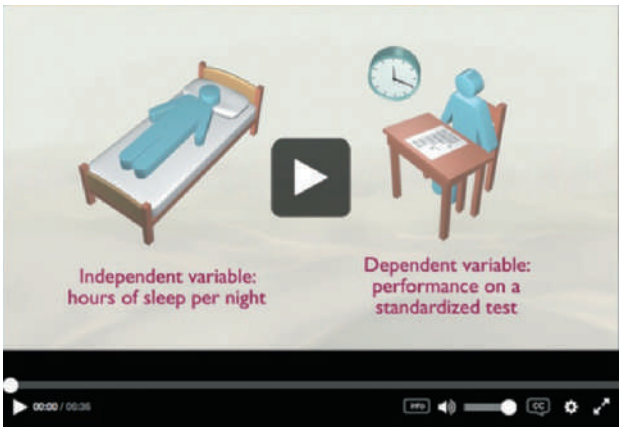
In an **experiment**, an investigator or experimenter typically devises two different conditions (or *treatments*) and then studies and compares the outcomes of the participants exposed to those two different conditions in order to see how behavior is affected. One group, the *treatment* or *experimental group*, is exposed to the treatment variable being studied; the other, the *control group*, is not.

experiment
a process in which an investigator, called an experimenter, devises two different experiences for participants and then studies and compares the outcomes

Although the terminology may seem daunting at first, there is an underlying logic that helps sort it out. Think in terms of a medical experiment in which the aim is to test the effectiveness of a new drug. In testing the drug, we wish to see if the drug successfully *treats* the disease. Consequently, the group that receives the drug would be called the *treatment* group. In comparison, another group of participants would not receive the drug treatment. Instead, they would be part of the no-treatment *control* group.

Similarly, suppose you want to see if exposure to movie violence makes viewers more aggressive. You might take a group of adolescents and show them a series of movies that contain a great deal of violent imagery. You would then measure their subsequent aggression. This group would constitute the treatment group. For the control group, you might take a second group of adolescents, show them movies that contain no aggressive imagery, and then measure their subsequent aggression. By comparing the amount of aggression displayed by members of the treatment and control groups, you would be able to determine whether exposure to violent imagery produces aggression in viewers. And this is just what a group of researchers in Belgium found: Running an experiment of this very sort, psychologist Jacques-Philippe Leyens and colleagues (Leyens et al., 1975) found that the level of aggression rose significantly for the adolescents who had seen the movies containing violence.

WATCH THIS VIDEO ON MYPSYCHLAB THE BASICS: SCIENTIFIC RESEARCH METHODS



The central feature of this experiment—and all experiments—is the comparison of the consequences of different treatments. The use of both treatment and control groups allows researchers to rule out the possibility that something other than the experimental manipulation produced the results found in the experiment. For instance, if a control group was not used, experimenters could not be certain that some other factor, such as the time of day the movies were shown, the need to sit still during the movie, or even the mere passage of time, produced the changes that were observed. By using a control group, then, experimenters can draw accurate conclusions about causes and effects.

independent variable
the variable that researchers manipulate in an experiment

dependent variable
the variable that researchers measure in an experiment and expect to change as a result of the experimental manipulation

INDEPENDENT AND DEPENDENT VARIABLES. The **independent variable** is the variable that researchers manipulate in the experiment (in our example, it is the type of movie participants saw—violent or nonviolent). In contrast, the **dependent variable** is the variable that researchers measure in an experiment and expect to change as a result of the experimental manipulation. In our example, the degree of aggressive behavior shown by the participants after viewing violent or nonviolent films is the dependent variable. (One way to remember the difference: A hypothesis predicts how a dependent variable *depends* on the manipulation of the independent variable.) In an experiment studying the effects of taking a drug, for instance, manipulating whether participants receive or don't receive a drug is the independent variable. Measurement of the effectiveness of the drug or no-drug treatment is the dependent variable. Every experiment has an independent and dependent variable.

Experimenters need to make sure their studies are not influenced by factors other than those they are manipulating. For this reason, they take great care to make sure that the participants in both the treatment and control groups are not aware of the purpose of the experiment (which could affect their responses or behavior) and that the experimenters do not have any influence over who is chosen for the control and treatment groups. The procedure that is used is known as random assignment. In *random assignment*, participants are assigned to different experimental groups or "conditions" on the basis of chance and chance alone. By using this technique, the laws of statistics ensure that personal characteristics that might affect the outcome of the experiment are divided proportionally among the participants in the different groups, making groups equivalent. Equivalent groups achieved by random assignment allow an experimenter to draw conclusions with confidence.

Figure 1-4 illustrates the Belgian experiment on adolescents exposed to films containing violent or nonviolent imagery and its effects on subsequent aggressive behavior. As you can see, it contains each of the elements of an experiment:

- An independent variable (the assignment to a film condition)
- A dependent variable (measurement of the adolescents' aggressive behavior)
- Random assignment to condition (viewing a film with aggressive imagery versus a film with nonaggressive imagery)
- A hypothesis that predicts the effect the independent variable will have on the dependent variable (that viewing a film with aggressive imagery will produce subsequent aggression)

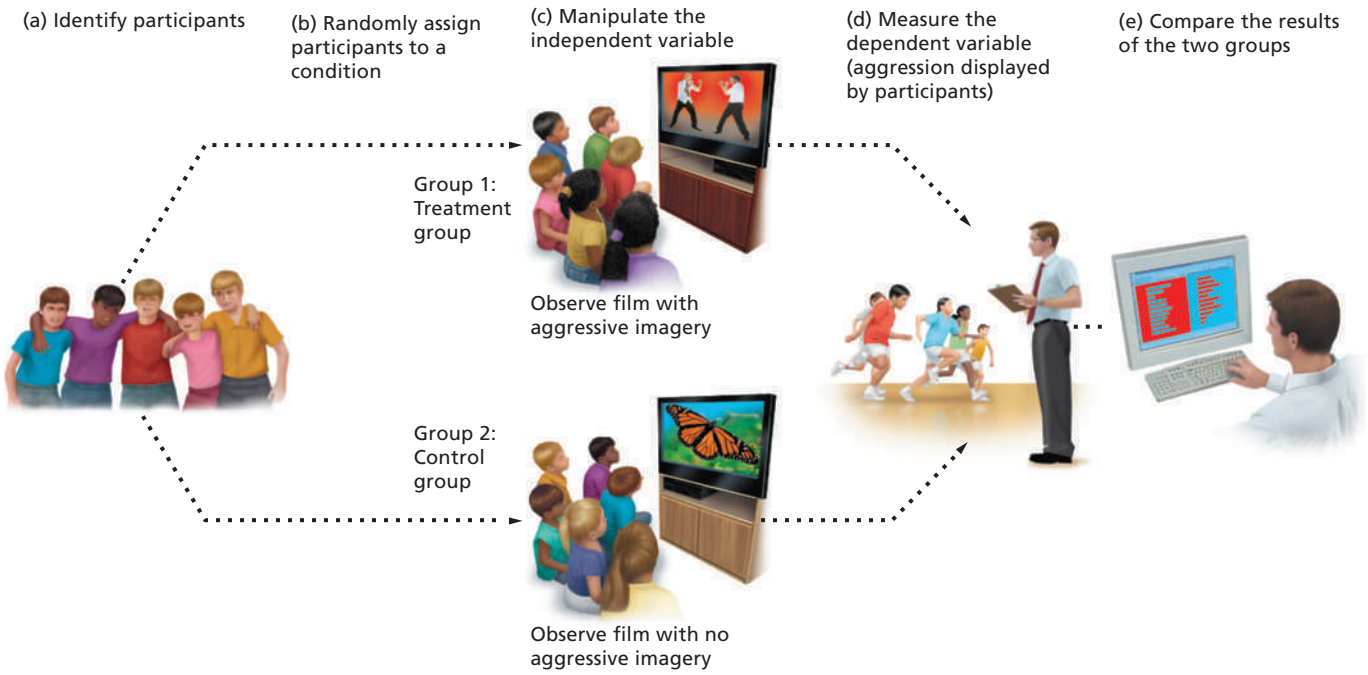


Figure 1-4 Elements of an Experiment

In this experiment, researchers randomly assigned a group of adolescents to one of two conditions: viewing a film that contained violent imagery or viewing a film that lacked violent imagery (manipulation of the independent variable). Participants were observed later to determine how much aggression they showed (the dependent variable). Analysis of the findings showed that adolescents exposed to aggressive imagery showed more aggression later. (Based on an experiment by Leyens et al., 1975.)

Given the advantage of experimental research—that it provides a means of determining causality—why aren't experiments always used? The answer is that there are some situations that a researcher, no matter how ingenious, simply cannot control. And there are some situations in which control would be unethical, even if it were possible. For instance, no researcher would be able to assign different groups of infants to parents of high and low socioeconomic status in order to learn the effects of such status on subsequent development. Similarly, we cannot control what a group of children watch on television throughout their childhood years in order to learn if childhood exposure to televised aggression leads to aggressive behavior later in life. Consequently, in situations in which experiments are logistically or ethically impossible, developmentalists employ correlational research.

Furthermore, it's also important to keep in mind that a single experiment is insufficient to answer a research question definitively. Before complete confidence can be placed in a conclusion, research must be *replicated*, or repeated, sometimes using other procedures and techniques with other participants. Sometimes developmentalists use a procedure called *meta-analysis*, which permits combining the results of many studies into one overall conclusion (Peterson & Brown, 2005).

CHOOSING A RESEARCH SETTING. Deciding *where* to conduct a study may be as important as determining *what* to do. In the Belgian experiment on the influence of exposure to media aggression, the researchers used a real-world setting—a group home for boys who had been convicted of juvenile delinquency. They chose this **sample**, the group of participants selected for the experiment, because it was useful to have adolescents whose normal level of aggression was relatively high and because they could incorporate showing the films into the everyday life of the home with minimal disruption.

sample
the group of participants chosen for the experiment

Using a real-world setting like the one in the aggression experiment is the hallmark of a field study. A **field study** is a research investigation carried out in a naturally occurring setting. Field studies may be carried out in preschool classrooms, at community playgrounds, on school buses, or on street corners. Field studies capture behavior in real-life settings, and research participants may behave more naturally than they would if they were brought into a laboratory.

field study
a research investigation carried out in a naturally occurring setting

Field studies may be used in both correlational studies and experiments. Field studies typically employ naturalistic observation, the technique we discussed earlier in which researchers observe some naturally occurring behavior without intervening or making changes in the situation. For instance, a researcher might examine behavior in a child-care center, view the groupings of adolescents in high school corridors, or observe elderly adults in a senior center.

However, it is often difficult to run an experiment in real-world settings, where it is hard to exert control over the situation and environment. Consequently, field studies are more typical of correlational designs than experimental designs, and most developmental research experiments are conducted in laboratory settings. A **laboratory study** is a research investigation conducted in a controlled setting explicitly designed to hold events constant. The laboratory may be a room or building designed for research, as in a university's psychology department. Their ability to control the settings in laboratory studies enables researchers to learn more clearly how their treatments affect participants.

laboratory study
a research investigation conducted in a controlled setting explicitly designed to hold events constant

Theoretical and Applied Research: Complementary Approaches

LO 1.16 Distinguish between theoretical research and applied research.

Developmental researchers typically focus on one of two approaches to research, carrying out either theoretical research or applied research. **Theoretical research** is designed specifically to test some developmental explanation and expand scientific knowledge, whereas **applied research** is meant to provide practical solutions to immediate problems. For instance, if we were interested in the processes of cognitive change during childhood,

theoretical research
research designed specifically to test some developmental explanation and expand scientific knowledge

applied research
research meant to provide practical solutions to immediate problems

we might carry out a study of how many digits children of various ages can remember after one exposure to multidigit numbers—a theoretical approach. Alternatively, we might focus on how children learn by examining ways in which elementary school instructors can teach children to remember information more easily. Such a study would represent applied research, because the findings are applied to a particular setting and problem.

There is not always a clear-cut distinction between theoretical and applied research. For instance, is a study that examines the effects of ear infections in infancy on later hearing loss theoretical or applied research? Because such a study may help illuminate the basic processes involved in hearing, it can be considered theoretical. But to the extent that the study helps us to understand how to prevent hearing loss in children and how various medicines may ease the consequences of the infection, it may be considered applied research (Lerner, Fisher, & Weinberg, 2000).

In short, even applied research can help advance our theoretical understanding of a particular topical area, and theoretical research can provide concrete solutions to a range of practical problems. In fact, as we discuss in the *From Research to Practice* box, research of both a theoretical and an applied nature has played a significant role in shaping and resolving a variety of public policy questions.

From Research to Practice

Using Developmental Research to Improve Public Policy

Does the Head Start preschool program actually work?

Does restricting teens' access to the Internet protect them from online harassment?

How are soldiers and their families affected when they return from war?

What are some effective ways to bolster schoolgirls' confidence in their math and science aptitude?

Are children better off with a mother and a father than they are with two mothers or two fathers?

Should children with developmental disabilities be schooled in regular classrooms, or are they better off in special classrooms with other children who are similarly disabled?

Each of these questions represents a national policy issue that can be answered only by considering the results of relevant research studies. By conducting controlled studies, developmental researchers have made a number of important contributions affecting education, family life, and health on a national scale. Consider, for instance, the variety of ways that public policy issues have been informed by various types of research findings (Maton et al., 2004; Mervis, 2004; Aber et al., 2007):

- *Research findings can provide policymakers a means of determining what questions to ask in the first place.* For example, the winding down of the wars in Iraq and Afghanistan has prompted questions about the impact on returning U.S. service members, with research showing that war has a lasting impact not only on them but also on their partners, children, and other family members whose needs should be considered in any interventions supporting the health and adjustment of veterans. Research has also disconfirmed the widespread belief that childhood vaccinations are linked to autism, contributing invaluable evidence to the controversy over the risks and benefits of mandatory child immunization (Price et al., 2010; Lester, Paley, Saltzman, & Klosinski, 2013).
- *Research findings and the testimony of researchers are often part of the process by which laws are drafted.* A good deal of legislation has been passed based on findings from developmental researchers. For example, research revealed that children with developmental disabilities benefit from exposure to children without special needs, ultimately leading to passage of national legislation mandating that children with disabilities be placed in regular school classes as often as possible. Research showing that children raised by same-sex couples fare just as well as children raised by a mother and father has undermined an often-used but baseless argument that same-sex marriage is harmful to children (Gartrell & Bos, 2010).
- *Policymakers and other professionals use research findings to determine how best to implement programs.* Research has shaped programs designed to reduce the incidence of unsafe sex among teenagers, to increase the level of prenatal care for pregnant mothers, to encourage and support women in the pursuit of math and science studies, and to promote flu shots for older adults. The common thread among such programs is that many of the details of the programs are built on basic research findings.
- *Research techniques are used to evaluate the effectiveness of existing programs and policies.* Once a public policy has been implemented, it is necessary to determine whether it

has been effective and successful in accomplishing its goals. To do this, researchers employ formal evaluation techniques, developed from basic research procedures. For instance, careful studies of DARE, a popular program meant to reduce children's use of drugs, began to find that it was ineffective. Using the research findings of developmentalists, DARE instigated new techniques, and preliminary findings suggest that the revised program is more effective. Other research on intervention strategies to prevent online harassment of adolescents shows that monitoring teens' Internet access is actually many times more effective than attempting to restrict it (University of Akron, 2006; Khurana, Bleakley, Jordan, & Romer, 2014).

By building on research findings, developmentalists have worked hand-in-hand with policymakers, and research has a substantial impact on public policies that can benefit us all.

Shared Writing Prompt

Despite the existence of research data that might inform policy about development, politicians rarely discuss such data in their speeches. Why do you think that is the case?

Measuring Developmental Change

LO 1.17 Compare longitudinal research, cross-sectional research, and sequential research.

How people grow and change through their life spans is central to the work of all developmental researchers. Consequently, one of the thorniest research issues they face concerns the measurement of change and differences over age and time. To solve this problem, researchers have developed three major research strategies: longitudinal research, cross-sectional research, and sequential research.

LONGITUDINAL STUDIES: MEASURING INDIVIDUAL CHANGE. If you were interested in learning how a child's moral development changes between the ages of three and five, the most direct approach would be to take a group of three-year-olds and follow them until they were five, testing them periodically.

Such a strategy illustrates longitudinal research. In **longitudinal research**, the behavior of one or more study participants is measured as they age. Longitudinal research measures change over time. By following many individuals over time, researchers can understand the general course of change across some period of life.

longitudinal research
research in which the behavior of one or more participants in a study is measured as they age

The granddaddy of longitudinal studies, which has become a classic, is a study of gifted children begun by Lewis Terman about 80 years ago. In the study—which has yet to be concluded—a group of 1,500 children with high IQs were tested about every five years. Now in their 80s, the participants—who call themselves "Termites"—have provided information on everything from intellectual accomplishment to personality and longevity (Feldhusen, 2003; McCullough, Tsang, & Brion, 2003; Subotnik, 2006).

Longitudinal research has also provided great insight into language development. For instance, by tracing how children's vocabularies increase on a day-by-day basis, researchers have been able to understand the processes that underlie the human ability to become competent in using language (Gershkoff-Stowe & Hahn, 2007; Oliver & Plomin, 2007; Childers, 2009; Fagan, 2009).

Assessing Longitudinal Studies. Longitudinal studies can provide a wealth of information about change over time. However, they have several drawbacks. For one thing, they require a tremendous investment of time, because researchers must wait for participants to age. Furthermore, participants often drop out over the course of the research, move away, or become ill or even die as the research proceeds.

Finally, participants who are observed or tested repeatedly may become "test-wise" and perform better each time they are assessed as they become more familiar with the procedure. Even if the observations of participants in a study are not terribly intrusive (such as simply recording, over a lengthy period of time, increases in vocabulary among infants and preschoolers), experimental participants may be affected by the repeated presence of an experimenter or observer.

Cross-sectional research allows researchers to compare representatives of different age groups at the same time.

Consequently, despite the benefits of longitudinal research, particularly its ability to look at change within individuals, developmental researchers often turn to other methods in conducting research. The alternative they choose most often is the cross-sectional study.

CROSS-SECTIONAL STUDIES. Suppose again that you want to consider how children's moral development, their sense of right and wrong, changes from ages three to five. Instead of using a longitudinal approach and following the same children over several years, we might conduct the study by simultaneously looking at three groups of children: three-year-olds, four-year-olds, and five-year-olds, perhaps presenting each group with the same problem, and then seeing how they respond to it and explain their choices.

cross-sectional research
research in which people of different ages are compared at the same point in time

Such an approach typifies cross-sectional research. In **cross-sectional research**, people of different ages are compared at the same point in time. Cross-sectional studies provide information about differences in development between different age groups.

Assessing Cross-Sectional Studies. Cross-sectional research is considerably more economical in terms of time than longitudinal research: Participants are tested at just one point in time. For instance, Terman's study conceivably might have been completed 75 years ago if Terman had simply looked at a group of gifted fifteen-year-olds, twenty-year-olds, twenty-five-year-olds, and so forth, all the way through a group of eighty-year-olds. Because the participants would not be periodically tested, there would be no chance that they would become test-wise, and problems of participant attrition would not occur. Why, then, would anyone choose to use a procedure other than cross-sectional research?

The answer is that cross-sectional research brings its own set of difficulties. Recall that every person belongs to a particular *cohort*, the group of people born at around the same time in the same place. If we find that people of different ages vary along some dimension, it may be due to differences in cohort membership, not age per se.

Consider a concrete example: If we find in a correlational study that people who are 25 years old perform better on a test of intelligence than those who are 75 years old, there are several explanations. Although the finding may be due to decreased intelligence in older people, it may also be attributable to cohort differences. The group of seventy-five-year-olds may have had less formal education than the twenty-five-year-olds because members of the older cohort were less likely to finish high school and attend college than members of the younger one. Or perhaps the older group performed less well because as infants they received less adequate nutrition than members of the younger group. In short, we cannot fully rule out the possibility that the differences we find between people of different age groups in cross-sectional studies are due to cohort differences.

Cross-sectional studies also may suffer from *selective dropout*, in which participants in some age groups are more likely to quit participating in a study than others. For example, suppose a study of cognitive development in preschoolers includes a lengthy assessment of cognitive abilities. It is possible that young preschoolers would find the task more difficult and demanding than older preschoolers. As a result, the younger children would be more likely to discontinue participation in the study than the older preschoolers. If the least competent young preschoolers are the ones who

sequential studies
research in which researchers examine a number of different age groups over several points in time

drop out, then the remaining sample of participants in the study will consist of the more competent young preschoolers—together with a broader and more representative sample of older preschoolers. The results of such a study would be questionable (Miller, 1998).

Finally, cross-sectional studies have an additional, and more basic, disadvantage: They are unable to inform us about changes in individuals or groups. If longitudinal studies are like videos taken of a person at various ages, cross-sectional studies are like snapshots of entirely different groups. Although we can establish differences related to age, we cannot fully determine whether such differences are related to change over time.

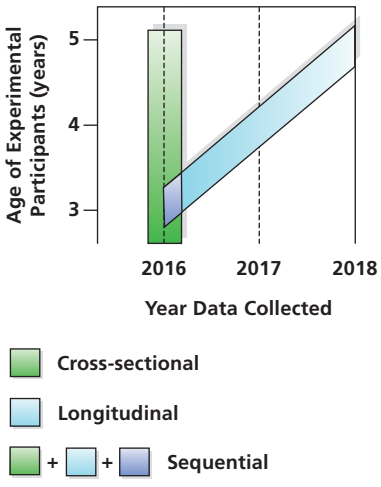
SEQUENTIAL STUDIES. Because both longitudinal and cross-sectional studies have drawbacks, researchers have turned to some compromise techniques. Among the most frequently employed are sequential studies, which are essentially a combination of longitudinal and cross-sectional studies.

In **sequential studies**, researchers examine a number of different age groups at several points in time. For instance, an investigator interested in children's moral behavior might begin a sequential study by examining the behavior of three groups of children who are three years old, four years old, or five years old at the time the study begins. (This is no different from the way a cross-sectional study would be done.)

However, the study wouldn't stop there but would continue for the next several years. During this period, each of the research participants would be tested annually. Thus, the three-year-olds would be tested at ages three, four, and five; the four-year-olds at ages four, five, and six; and the five-year-olds at ages five, six, and seven. Such an approach combines the advantages of longitudinal and cross-sectional research, and it permits developmental researchers to tease out the consequences of age *change* versus age *difference*. The major research techniques for studying development are summarized in Figure 1-5.

Figure 1-5 Research Techniques for Studying Development

In a *cross-sectional study*, three-, four-, and five-year-olds are compared at a similar point in time (in the year 2016). In *longitudinal research*, a set of participants who are three years old in 2016 are studied when they are four years old (in 2017) and when they are five years old (in 2018). Finally, a *sequential study* combines cross-sectional and longitudinal techniques; here, a group of three-year-olds would be compared initially in 2016 with four- and five-year-olds but would also be studied one and two years later, when they themselves were four and five years old. Although the graph does not illustrate this, researchers carrying out this sequential study might also choose to retest the children who were four and five in 2016 for the next two years. What advantages do the three kinds of studies offer?



Ethics and Research

LO 1.18 Describe some ethical issues that affect psychological research.

In the "study" conducted by Egyptian King Psamtik, two children were removed from their mothers and held in isolation in an effort to learn about the roots of language. If you found yourself thinking this was extraordinarily cruel, you are in good company. Clearly, such an experiment raises blatant ethical concerns, and nothing like it would ever be done today.

In order to help researchers avoid ethical problems, the major organizations of developmentalists, including the Society for Research in Child Development and the American Psychological Association, have developed comprehensive ethical guidelines for researchers. Among the basic principles that must be followed are those involving freedom from harm, informed consent, the use of deception, and maintenance of participants' privacy (American Psychological Association, 2002; Toporek, Kwan, & Williams, 2012; Joireman & Van Lange, 2015):

- ***Researchers must protect participants from physical and psychological harm.*** Their welfare, interests, and rights come before those of researchers. In research, participants' rights always come first (Sieber, 2000; Fisher, 2004).
- ***Researchers must obtain informed consent from participants before their involvement in a study.*** If they are over the age of seven, participants must voluntarily agree to be in a study. For those under 18, their parents or guardians must also provide consent.

  The requirement for informed consent raises some difficult issues. Suppose, for instance, researchers want to study the psychological effects of abortion on adolescents. Although they may be able to obtain the consent of an

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adolescent who has had an abortion, the researchers may need to get her parents' permission as well because she is a minor. But if the adolescent hasn't told her parents about the abortion, the mere request for permission from the parents would violate her privacy—leading to a breach of ethics.

From the perspective of *a health-care provider*

Do you think there are some special circumstances involving adolescents, who are not legally adults, that would justify allowing them to participate in a study without obtaining their parents' permission? What might such circumstances involve?

- ***The use of deception in research must be justified and cause no harm.*** Although deception to disguise the true purpose of an experiment is permissible, any experiment that uses deception must undergo careful scrutiny by an independent panel before it is conducted. Suppose, for example, we want to know the reaction of participants to success and failure. It is ethical to tell participants that they will be playing a game when the true purpose is actually to observe how they respond to doing well or poorly on the task. However, such a procedure is ethical only if it causes no harm to participants, has been approved by a review panel, and ultimately includes a full debriefing, or explanation, for participants when the study is over (Underwood, 2005).
- ***Participants' privacy must be maintained.*** If participants are videotaped during the course of a study, for example, they must give their permission for the videotapes to be viewed. Furthermore, access to the tapes must be carefully restricted.

Are You an Informed Consumer of Development?

Thinking Critically About "Expert" Advice

If you immediately comfort crying babies, you'll spoil them.

If you let babies cry without comforting them, they'll be untrusting and clingy as adults.

Spanking is one of the best ways to discipline your child.

Never hit your child.

If a marriage is unhappy, children are better off if their parents divorce than if they stay together.

No matter how difficult a marriage is, parents should avoid divorce for the sake of their children.

There is no lack of advice on the best way to raise a child or, more generally, to lead one's life. From best-sellers such as *Chicken Soup for the Soul: On Being a Parent* to magazine and newspaper columns that provide advice on every imaginable topic, each of us is exposed to tremendous amounts of information.

Yet not all advice is equally valid. The mere fact that something is in print or on television or the Internet does not make it legitimate or accurate. Fortunately, some guidelines can help distinguish when recommendations and suggestions are reasonable and when they are not:

- **Consider the source of the advice.** Information from established, respected organizations such as the American Medical Association, the American Psychological Association, and the American Academy of Pediatrics is likely to be the result of years of study, and its accuracy is probably high. If you don't know the organization, investigate further to find out more about its goals and philosophy.
- **Evaluate the credentials of the person providing advice.** Information coming from established, acknowledged researchers and experts in a field is likely to be more accurate than that coming from a person whose credentials are obscure. Consider where the author is employed and whether he or she has a particular political or personal agenda.
- **Understand the difference between anecdotal evidence and scientific evidence.** Anecdotal evidence is based on one or two instances of a phenomenon, haphazardly discovered or encountered; scientific evidence is based on careful, systematic procedures. If an aunt tells you that all her children slept through the night by two months of age and therefore so can your child, that is quite different from reading a report that 75 percent of children sleep through the night by nine months. Of course, even with such a report, it would be a good idea to find out how large the study was or how this number was arrived at.

- **If advice is based on research findings, there should be a clear, transparent description of the studies on which the conclusion is based.** Who were the participants in the study? What were the methods used? What do the results show? Think critically about the way in which the findings were obtained before accepting them.
- **Do not overlook the cultural context of the information.** Although an assertion may be valid in some contexts, it may not be true in all situations. For example, it is typically assumed that providing infants the freedom to move about and exercise their limbs facilitates their muscular development and mobility. Yet in some cultures, infants spend most of their time closely bound to their mothers—with no apparent long-term damage (Tronick, 1995).
- **Don't assume that because many people believe something, it is necessarily true.** Scientific evaluation has often proved that some of the most basic presumptions about the effectiveness of various techniques are invalid.

In short, the key to evaluating information relating to human development is to maintain a healthy dose of skepticism. No source of information is invariably, unfailingly accurate. By keeping a critical eye on the statements you encounter, you'll be in a better position to determine the very real contributions made by developmentalists to understanding how humans develop over the course of their life spans.

Module 1.3 Review

- Theories in development are systematically derived explanations of facts or phenomena. Theories suggest hypotheses, which are predictions that can be tested.
- Correlational research seeks to identify whether an association or relationship between two factors exists. Experimental research is designed to discover *causal* relationships between various factors.
- Naturalistic observation, case studies, and survey research are types of correlational studies. Some developmental researchers also make use of psychophysiological methods.
- Experimental research seeks to discover cause-and-effect relationships by the use of a treatment group and a control group. By manipulating the independent variable and observing changes in the dependent variable, researchers find evidence of causal links between variables. Research studies may be conducted in field settings, where participants are subject to natural conditions, or in laboratories, where conditions can be controlled.
- Theoretical research is designed specifically to test some developmental explanation and expand scientific knowledge, whereas applied research is meant to provide practical solutions to immediate problems.
- Researchers measure age-related change through longitudinal studies, cross-sectional studies, and sequential studies.
- Developmental researchers must follow ethical standards for conducting research. Ethical guidelines for researchers cover freedom from harm, informed consent, the use of deception, and preservation of participant privacy.

Journal Writing Prompt

Applying Lifespan Development: Formulate a theory about one aspect of human development and a hypothesis that relates to it.

Epilogue

As we've seen, the scope of lifespan development is broad, touching on a wide range of topics that address how people grow and change through the course of life. We've also found that there are a variety of techniques by which developmentalists seek to answer questions of interest.

Before proceeding to the next chapter, take a few minutes to reconsider the prologue of this chapter—about Louise Brown, the first child to be born through *in vitro* fertilization. Based on what you now know about lifespan development, answer the following questions:

1. What are some of the potential benefits, and the costs, of the type of conception—*in vitro*—that was carried out for Louise's parents?
2. What are some questions that developmentalists might ask about the possible effects being conceived via *in vitro* fertilization had on Louise's physical, cognitive, and personality and social development?
3. Louise reported feeling lonely and isolated as a child. Why do you think this occurred, and what effects might it have on her as an adult?
4. Louise's own son was conceived in the traditional manner. How do you think his development will differ from that of his mother, and why?

Looking Back

LO 1.1 Define the field of lifespan development and describe what it encompasses.

Lifespan development is a scientific approach to questions about growth, change, and stability in the physical, cognitive, social, and personality characteristics at all ages from conception to death.

LO 1.2 Describe the areas that lifespan development specialists cover.

Some developmentalists focus on physical development, examining the ways in which the body's makeup helps determine behavior. Other developmental specialists examine cognitive development, seeking to understand how growth and change in intellectual capabilities influence a person's behavior. Still other developmental specialists focus on personality and social development. In addition to choosing to specialize in a particular topical area, developmentalists also typically look at a particular age range.

LO 1.3 Describe some of the basic influences on human development.

Each individual is subject to normative history-graded influences, normative age-graded influences, normative sociocultural-graded influences, and non-normative life events. Culture—both broad and narrow—is an important issue in lifespan development. Many aspects of development are influenced not only by broad cultural differences but also by ethnic, racial, and socioeconomic differences within a particular culture.

LO 1.4 Summarize four key issues in the field of lifespan development.

Four key issues in lifespan development are (1) whether developmental change is continuous or discontinuous; (2) whether development is largely governed by critical periods during which certain influences or experiences must occur for development to be normal; (3) whether to focus on certain particularly important periods in human development or on the entire life span; and (4) the nature–nurture controversy, which focuses on the relative importance of genetic versus environmental influences.

LO 1.5 Describe how the psychodynamic perspective explains lifespan development.

The psychodynamic perspective is exemplified by the psychoanalytic theory of Freud and the psychosocial theory of Erikson. Freud focused attention on the unconscious and on stages through which children must pass successfully to avoid harmful fixations. Erikson identified eight distinct stages of development, each characterized by a conflict, or crisis, to work out.

LO 1.6 Describe how the behavioral perspective explains lifespan development.

The behavioral perspective typically concerns stimulus–response learning, exemplified by classical conditioning, the operant conditioning of Skinner, and Bandura's social-cognitive learning theory.

LO 1.7 Describe how the cognitive perspective explains lifespan development.

Within the cognitive perspective, the most notable theorist is Piaget, who identified developmental stages through which all children are assumed to pass. Each stage involves qualitative differences in thinking. In contrast, information processing approaches attribute cognitive growth to quantitative changes in mental processes and capacities, and cognitive neuroscience approaches focus on biological brain processes.

LO 1.8 Describe how the humanistic perspective explains lifespan development.

The humanistic perspective contends that people have a natural capacity to make decisions about their lives and control their behavior. The humanistic perspective emphasizes free will and the natural desire of humans to reach their full potential.

LO 1.9 Describe how the contextual perspective explains lifespan development.

The contextual perspective considers the relationship between individuals and their physical, cognitive, personality, and social worlds. The bioecological approach stresses the interrelatedness of developmental areas and the importance of broad cultural factors in human development. Vygotsky's sociocultural theory emphasizes the central influence on cognitive development exerted by social interactions between members of a culture.

LO 1.10 Describe how the evolutionary perspective explains lifespan development.

The evolutionary perspective attributes behavior to genetic inheritance from our ancestors, contending that genes determine not only traits such as skin and eye color, but certain personality traits and social behaviors as well.

LO 1.11 Discuss the value of applying multiple perspectives to lifespan development.

The various theoretical perspectives provide different ways of looking at development. An eclectic approach paints a more complete picture of the ways humans change over the life span.

LO 1.12 Describe the role that theories and hypotheses play in the study of development.

Theories are broad explanations of facts or phenomena of interest, based on a systematic integration of prior findings and theories. Hypotheses are theory-based predictions that can be tested. The process of posing and answering questions systematically is called the scientific method.

LO 1.13 Describe the two major categories of lifespan development research.

Researchers test hypotheses by correlational research (to determine whether two factors are associated) and experimental research (to discover cause-and-effect relationships).

LO 1.14 Identify different types of correlational studies and their relationship to cause and effect.

Correlational studies use naturalistic observation, case studies, and survey research to investigate whether certain characteristics of interest are associated with other characteristics. Some developmental researchers also make use of psychophysiological methods. Correlational studies lead to no direct conclusions about cause and effect.

LO 1.15 Explain the main features of an experiment.

Typically, experimental research studies are conducted on participants in a treatment group who receive the experimental treatment and participants in a control group who do not. Following the treatment, differences between the two groups can help the experimenter to determine the effects of the treatment. The independent variable is the variable that researchers manipulate in the experiment, whereas the dependent variable is the variable that researchers measure in an experiment and expect to change as a result of the experimental manipulation. Experiments may be conducted in a laboratory or in a real-world setting.

LO 1.16 Distinguish between theoretical research and applied research.

Theoretical research is designed specifically to test some developmental explanation and expand scientific knowledge, while applied research is meant to provide practical solutions to immediate problems.

LO 1.17 Compare longitudinal research, cross-sectional research, and sequential research.

To measure change across human ages, researchers use longitudinal studies of the same participants over time, cross-sectional studies of different-age participants conducted at one time, and sequential studies of different-age participants at several points in time.

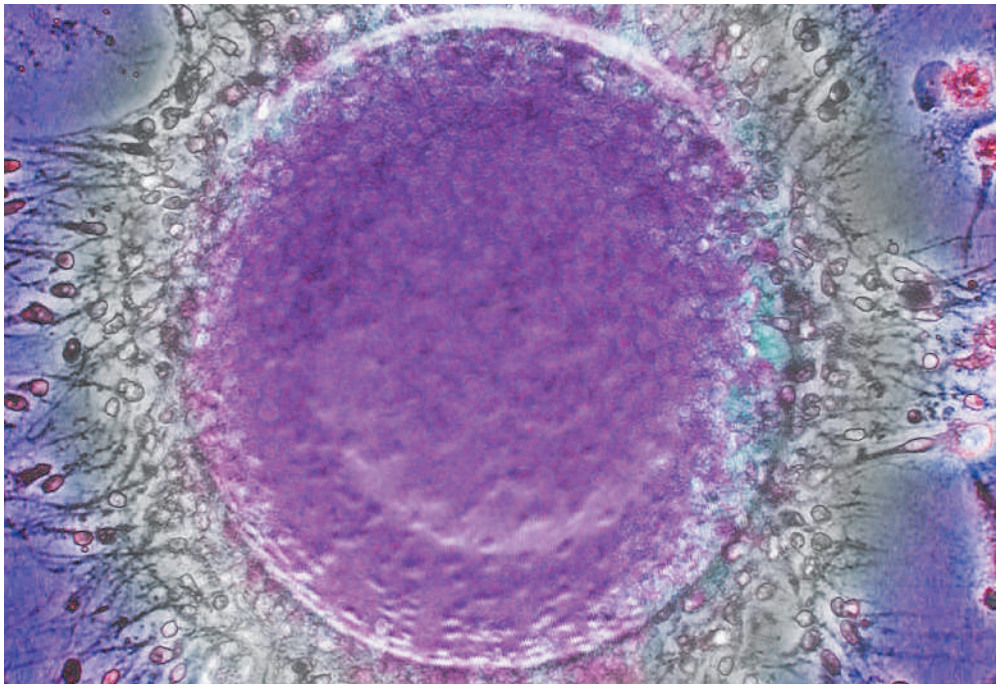
LO 1.18 Describe some ethical issues that affect psychological research.

Ethical issues that affect psychological research include the protection of participants from harm, informed consent of participants, limits on the use of deception, and the maintenance of privacy.

Key Terms and Concepts

Chapter 2

The Start of Life: Prenatal Development



Learning Objectives

LO 2.1 Describe how genes and chromosomes provide our basic genetic endowment.

LO 2.2 Compare monozygotic twins with dizygotic twins.

LO 2.3 Describe how the sex of a child is determined.

LO 2.4 Explain the mechanisms by which genes transmit information.

LO 2.5 Describe the field of behavioral genetics.

LO 2.6 Describe the major inherited disorders.

LO 2.7 Describe the role of genetic counselors and differentiate between different forms of prenatal testing.

LO 2.8 Explain how the environment and genetics work together to determine human characteristics.

LO 2.9 Summarize how researchers study the interaction of genetic and environmental factors in development.

LO 2.10 Explain how genetics and the environment jointly influence physical traits, intelligence, and personality.

LO 2.11 Explain the role genetics and the environment play in the development of psychological disorders.

LO 2.12 Describe ways in which genes influence the environment.

LO 2.13 Explain the process of fertilization.

LO 2.14 Summarize the three stages of prenatal development.

LO 2.15 Describe some of the physical and ethical challenges that relate to pregnancy.

LO 2.16 Describe the threats to the fetal environment and what can be done about them.

Chapter Overview

Prologue: Going with the Odds

When a prenatal ultrasound at 20 weeks revealed that Tim and Laura Chen's unborn son had a severe form of spina bifida, their first question was: *Can this be fixed?* Laura's doctor outlined their choices. They could wait to enclose the spinal cord until after the baby's birth, but this might endanger the spine and brain, which can be damaged in late pregnancy. And their child could still experience paralysis, cognitive impairments, and bladder and bowel issues. On the other hand, surgery could be performed before birth. Doctors would tip Laura's uterus outside her body, make an incision, and sew up the hole exposing the spinal cord. There would be a greater risk of preterm labor, but a better chance of minimizing lifelong damage. The Chens chose fetal surgery. Three years later, their son has minor bladder issues, but he walks independently and his preschool cognitive assessment placed him in the 85th percentile. "We're so lucky to be living in a time when such surgery is possible," Laura says. ■

Looking Ahead

The Chens' story illustrates the powerful benefits—and the often difficult decisions—that advances in our understanding of the prenatal period and our ability to detect physical problems prenatally have brought us. In this chapter, we'll examine what developmental researchers and other scientists have learned about ways that heredity and the environment work in tandem to create and shape human beings, and how that knowledge is being used to improve people's lives. We begin with the basics of heredity, the genetic transmission of characteristics from biological parents to their children, by examining how we receive our genetic endowment. We'll consider an area of study, behavioral genetics, that specializes in the consequences of heredity on behavior. We'll also discuss what happens when genetic factors cause development to go off track, and how such problems are dealt with through genetic counseling and, in some cases, manipulation of a child's genes.

Prenatal tests have become increasingly sophisticated.

But genes are only one part of the story of prenatal development. We'll also consider the ways in which a child's genetic heritage interacts with the environment in which he or she grows up—how one's family, socioeconomic status, and life events can affect a variety of characteristics, including physical traits, intelligence, and even personality.

Finally, we'll focus on the very first stage of development, tracing prenatal growth and change. We'll review some of the alternatives available to couples who find it difficult to conceive. We'll also talk about the stages of the prenatal period and how the prenatal environment offers both threats to—and the promise of—future growth.

Earliest Development

We humans begin the course of our lives simply. Like individuals from tens of thousands of other species, we start as a single cell, a tiny speck probably weighing no more than a 20-millionth of an ounce. But, as we'll see in this section, from this humble beginning, in a matter of just several months if all goes well, a living, breathing individual infant is born.

zygote
the new cell formed by the process of fertilization.

genes
the basic units of genetic information.

DNA (deoxyribonucleic acid) molecules
the substance that genes are composed of that determines the nature of every cell in the body and how it will function.

chromosomes
rod-shaped portions of DNA that are organized in 23 pairs.

Genes and Chromosomes: The Code of Life

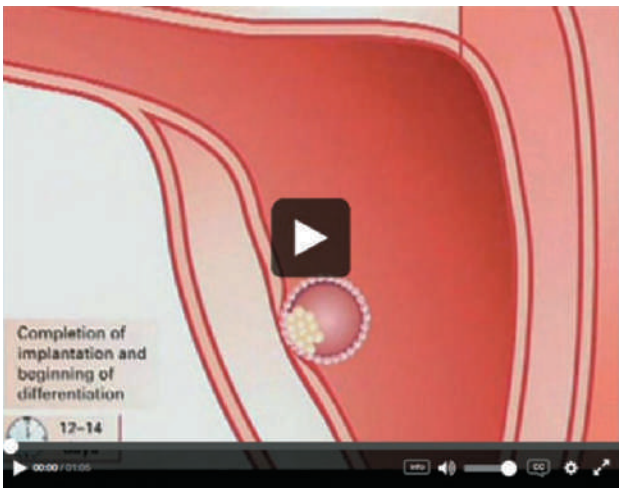
LO 2.1 Describe how genes and chromosomes provide our basic genetic endowment.

The single cell we described above is created when a male reproductive cell, a *sperm*, pushes through the membrane of the *ovum*, the female reproductive cell. These *gametes*, as the male and female reproductive cells also are known, each contain huge amounts of genetic information. About an hour or so after the sperm enters the ovum, the two gametes suddenly fuse, becoming one cell, a **zygote**. The resulting combination of their genetic instructions—over 2 billion chemically coded messages—is sufficient to begin creating a whole person. The blueprints for creating a person are stored and communicated in our **genes**, the basic units of genetic information. The roughly 25,000 human genes are the biological equivalent of "software" that programs the future development of all parts of the body's "hardware."

All genes are composed of specific sequences of **DNA (deoxyribonucleic acid) molecules**. The genes are arranged in specific locations and in a specific order along 46 **chromosomes**, rod-shaped portions of DNA that are organized in 23 pairs. Only sex cells—the ova and the sperm—contain half this number, so that a child's mother and father each provide one of the two chromosomes in each of the 23 pairs. The 46 chromosomes (in 23 pairs) in the new zygote contain the genetic blueprint that will guide cell activity for the rest of the individual's life (Pennisi, 2000; International Human Genome Sequencing Consortium, 2001; see Figure 2-1). Through a process called *mitosis*, which accounts for the replication of most types of cells, nearly all the cells of the body will contain the same 46 chromosomes as the zygote.

Specific genes in precise locations on the chain of chromosomes determine the nature and function of every cell in the body. For instance, genes determine which cells will ultimately become

WATCH THIS VIDEO ON MYPSYCHLAB
PERIOD OF THE ZYGOTE



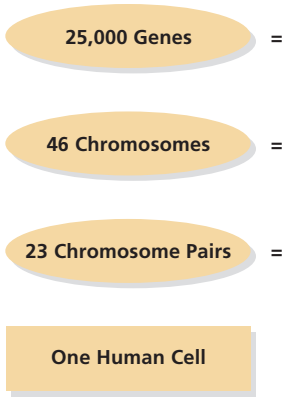
part of the heart and which will become part of the muscles of the leg. Genes also establish how different parts of the body will function—how rapidly the heart will beat, for example, or how much strength a muscle will have.

If each parent provides just 23 chromosomes, where does the potential for the vast diversity of human beings come from? The answer resides primarily in the nature of the processes that underlie the cell division of the gametes. When gametes—the sex cells, sperm and ova—are formed in the adult human body in a process called *meiosis*, each gamete receives one of the two chromosomes that make up each of the 23 pairs. Because for each of the 23 pairs it is largely a matter of chance which member of the pair is contributed, there are 2^{23}, or some 8 million, different combinations possible. Furthermore, other processes, such as random transformations of particular genes, add to the variability of the genetic brew. The ultimate outcome: tens of *trillions* of possible genetic combinations.

With so many possible genetic mixtures provided by heredity, there is no likelihood that someday you'll bump into a genetic duplicate of yourself—with one exception: an identical twin.

Figure 2-1 The Contents of a Single Human Cell

At the moment of conception, humans receive about 25,000 genes, contained on 46 chromosomes in 23 pairs.



Multiple Births: Two—or More—for the Genetic Price of One

LO 2.2 **Compare monozygotic twins with dizygotic twins.**

Although it doesn't seem surprising when dogs and cats give birth to several offspring at one time, in humans, multiple births are cause for comment. They should be: less than 3 percent of all pregnancies produce twins, and the odds are even slimmer for three or more children.

Why do multiple births occur? Some occur when a cluster of cells in the ovum split off within the first 2 weeks after fertilization. The result is two genetically identical zygotes, which, because they come from the same original zygote, are called monozygotic. **Monozygotic twins** are twins who are genetically identical. Any differences in their future development can be attributed only to environmental factors, since genetically they are exactly the same.

There is a second, and actually more common, mechanism that produces multiple births. In these cases, two separate ova are fertilized by two separate sperm at roughly the same time. Twins produced in this fashion are known as **dizygotic twins**. Because they are the result of two separate ovum–sperm combinations, they are no more genetically similar than two siblings born at different times.

Of course, not all multiple births produce only two babies. Triplets, quadruplets, and even more births are produced by either (or both) of the mechanisms that yield twins. Thus, triplets may be some combination of monozygotic, dizygotic, or trizygotic.

Although the chances of having a multiple birth are typically slim, the odds rise considerably when couples use fertility drugs to improve the probability they will conceive a child. For Caucasian couples in the United States, for example, 1 in 10 couples using fertility drugs have dizygotic twins, compared to an overall figure of 1 in 86. Older women, too, are more likely to have multiple births, and multiple births are also more common in some families than in others. The increased use of fertility drugs and rising average age of mothers giving birth has meant that multiple births have increased in the last three decades (see Figure 2-2; Martin et al., 2005).

There are also racial, ethnic, and national differences in the rate of multiple births, probably due to inherited differences in the likelihood that more than one ovum will be released at a time. One out of 70 African American couples have dizygotic births, compared with 1 out of 86 for white American couples (Vaughan, McKay, & Behrman, 1979; Wood, 1997).

At the moment of conception, humans receive 23 pairs of chromosomes, half from the mother and half from the father. These chromosomes contain thousands of genes.

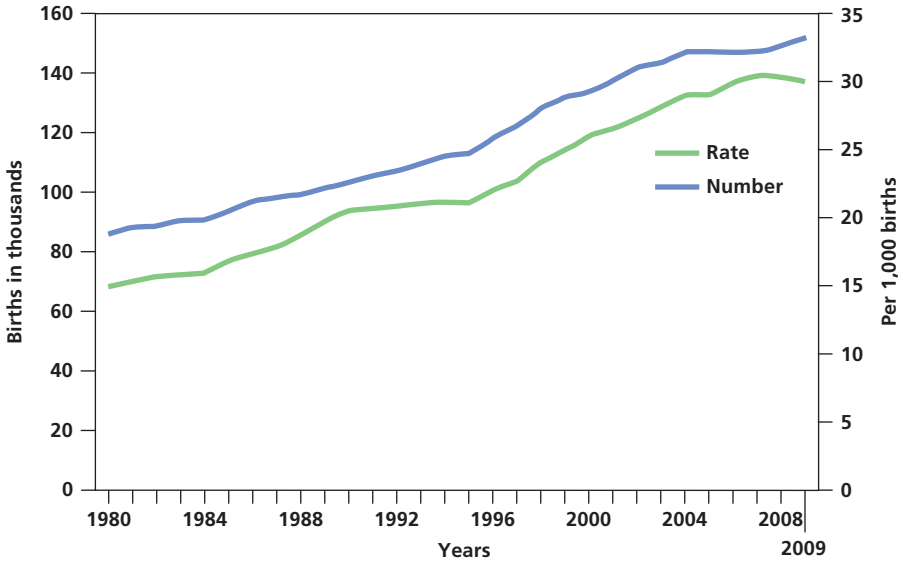
monozygotic twins
twins who are genetically identical.

dizygotic twins
twins who are produced when two separate ova are fertilized by two separate sperm at roughly the same time.

Figure 2-2 Rising Multiples

The number and rate of twin births has risen considerably over the past three decades.

(Source: CDC/NCHS, National Vital Statistics System, 2012.)



Mothers carrying multiple children run a higher-than-average risk of premature delivery and birth complications. Consequently, these mothers must be particularly concerned about their prenatal care.

Boy or Girl? Establishing the Sex of the Child

LO 2.3 **Describe how the sex of a child is determined.**

Recall that there are 23 matched pairs of chromosomes. In 22 of these pairs, each chromosome is similar to the other member of its pair. The one exception is the twenty-third pair, which is the one that determines the sex of the child. In females, the twenty-third pair consists of two matching, relatively large, X-shaped chromosomes, appropriately identified as XX. In males, however, the members of the pair are dissimilar. One consists of an X-shaped chromosome, but the other is a shorter, smaller, Y-shaped chromosome. This pair is identified as XY.

As we discussed earlier, each gamete carries one chromosome from each of the parent's 23 pairs of chromosomes. Since a female's twenty-third pair of chromosomes are both Xs, an ovum will always carry an X chromosome, no matter which chromosome of the twenty-third pair it gets. A male's twenty-third pair is XY, so each sperm could carry either an X or a Y chromosome.

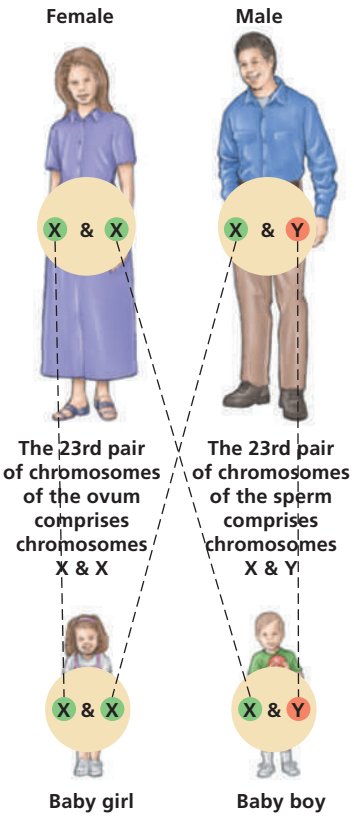
If the sperm contributes an X chromosome when it meets an ovum (which, remember, will always contribute an X chromosome), the child will have an XX pairing on the twenty-third chromosome—and will be a female. If the sperm contributes a Y chromosome, the result will be an XY pairing—a male (see Figure 2-3).

It is clear from this process that the father's sperm determines the sex of the child. This fact is leading to the development of techniques that will allow parents to increase the chances of specifying the sex of their child. In one new technique, lasers measure the DNA in sperm. By discarding sperm that harbor the unwanted sex chromosome, the chances of having a child of the desired sex increase dramatically (Hayden, 1998; Belkin, 1999; Van Balen, 2005).

Of course, procedures for choosing a child's sex raise ethical and practical issues. For example, in cultures that value one sex over the other, might there be a kind of sex discrimination prior to birth? Furthermore, a shortage of children of the less preferred

Figure 2-3 Determining Sex

When an ovum and sperm meet at the moment of fertilization, the ovum is certain to provide an X chromosome, while the sperm will provide either an X or a Y chromosome. If the sperm contributes its X chromosome, the child will have an XX pairing on the twenty-third chromosome and will be a girl. If the sperm contributes a Y chromosome, the result will be an XY pairing—a boy. Does this mean that girls are more likely to be conceived than boys?



sex might ultimately emerge. Many questions remain, then, before sex selection becomes routine (Sharma, 2008; Bhagat, Ananya, & Sharma, 2012).

The Basics of Genetics: The Mixing and Matching of Traits

LO 2.4 Explain the mechanisms by which genes transmit information.

What determined the color of your hair? Why are you tall or short? What made you susceptible to hay fever? And why do you have so many freckles? To answer these questions, we need to consider the basic mechanisms involved in the way that the genes we inherit from our parents transmit information.

We can start by examining the discoveries of an Austrian monk, Gregor Mendel, in the mid-1800s. In a series of simple yet convincing experiments, Mendel cross-pollinated pea plants that always produced yellow seeds with pea plants that always produced green seeds. The result was not, as one might guess, a plant with a combination of yellow and green seeds. Instead, all of the resulting plants had yellow seeds. At first it appeared that the green-seeded plants had had no influence.

However, Mendel's additional research proved this was not true. He bred together plants from the new, yellow-seeded generation that had resulted from his original cross-breeding of the green-seeded and yellow-seeded plants. The consistent result was a ratio of three-fourths yellow seeds to one-fourth green seeds. Why did this 2-to-1 ratio of yellow to green seeds appear so consistently? It was Mendel's genius to provide an answer. Based on his experiments with pea plants, he argued that when two competing traits, such as a green or yellow coloring of seeds, were both present, only one could be expressed. The one that was expressed was called a **dominant trait**. Meanwhile, the other trait remained present in the organism, although it was not expressed (displayed). This was called a **recessive trait**. In the case of Mendel's original pea plants, the offspring plants received genetic information from both the green-seeded and yellow-seeded parents. However, the yellow trait was dominant, and consequently the recessive green trait did not assert itself.

dominant trait
the one trait that is expressed when two competing traits are present.

recessive trait
a trait within an organism that is present, but is not expressed.

Keep in mind, however, that genetic material relating to both parent plants is present in the offspring, even though it cannot be seen. The genetic information is known as the organism's genotype. A **genotype** is the underlying combination of genetic material present (but outwardly invisible) in an organism. In contrast, a **phenotype** is the observable trait, the trait that is actually seen.

genotype
the underlying combination of genetic material present (but not outwardly visible) in an organism.

phenotype
an observable trait; the trait that is actually seen.

Although the offspring of the yellow-seeded and green-seeded pea plants all have yellow seeds (i.e., they have a yellow-seeded phenotype), the genotype consists of genetic information relating to both parents.

And what is the nature of the information in the genotype? To answer that question, let's turn from peas to people. In fact, the principles are the same not just for plants and humans but for the majority of species.

Recall that parents transmit genetic information to their offspring via the chromosomes they contribute through the gamete they provide during fertilization. Some of the genes form pairs called *alleles*, genes governing traits that may take alternate forms, such as hair or eye color. For example, brown eye color is a dominant trait (B); blue eyes are recessive (b). A child's allele may contain similar or dissimilar genes from each parent. If, on the one hand, the child receives similar genes, he or she is said to be **homozygous** for the trait. On the other hand, if the child receives different forms of the gene from its parents, he or she is said to be **heterozygous**. In the case of heterozygous alleles (Bb), the dominant characteristic, brown eyes, is expressed. However, if the child happens to receive a recessive allele from each of its parents, and therefore lacks a dominant characteristic (bb), it will display the recessive characteristic, such as blue eyes.

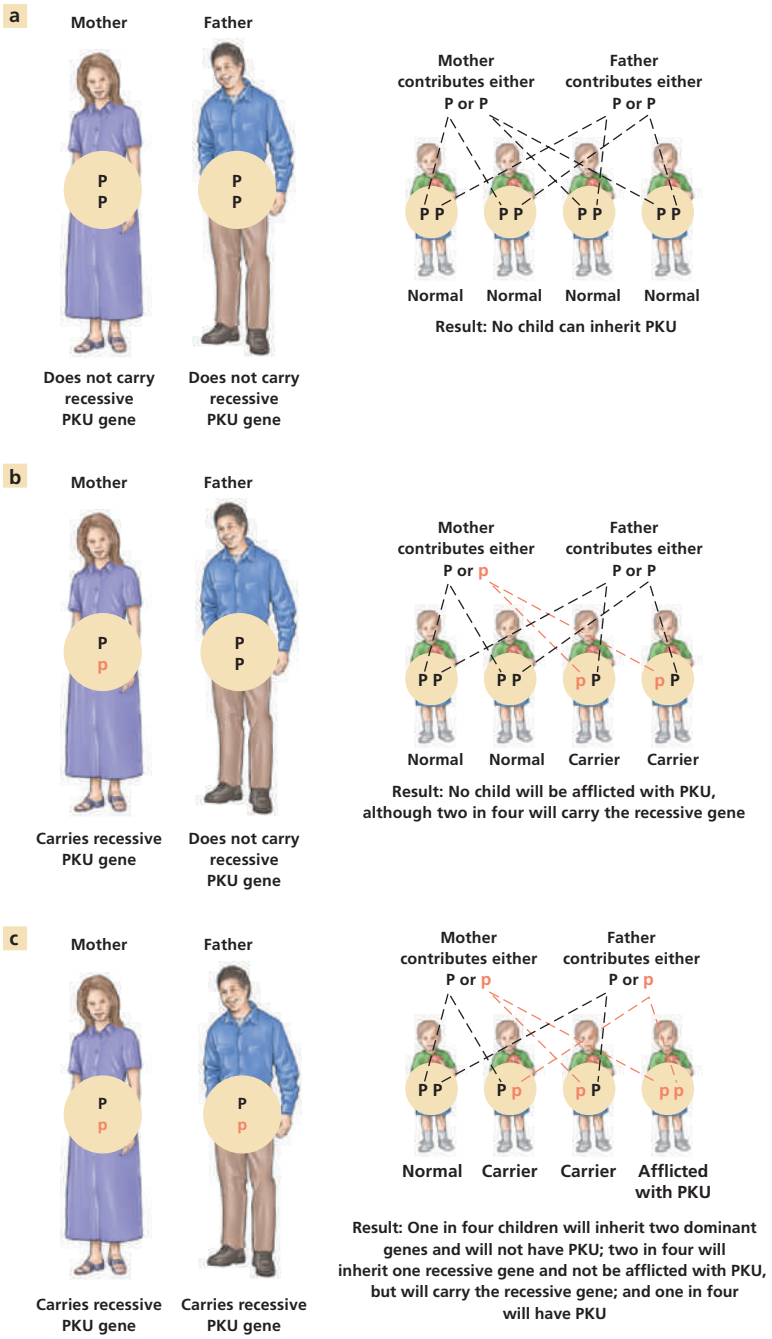
homozygous
inheriting from parents similar genes for a given trait.

heterozygous
inheriting from parents different forms of a gene for a given trait.

EXAMPLE OF TRANSMISSION OF GENETIC INFORMATION. We can see this process at work in humans by considering the transmission of *phenylketonuria (PKU)*,

Figure 2-4 PKU Probabilities

PKU, a disease that causes brain damage and mental retardation, is produced by a single pair of genes inherited from one's mother and father. (a) If neither parent carries a gene for the disease, a child cannot develop PKU. (b) Even if one parent carries the recessive gene, but the other doesn't, the child cannot inherit the disease. (c) However, if both parents carry the recessive gene, there is a one in four chance that the child will have PKU.



an inherited disorder in which a child is unable to make use of phenylalanine, an essential amino acid present in proteins found in milk and other foods. If left untreated, PKU allows phenylalanine to build up to toxic levels, causing brain damage and mental retardation (Moyle et al., 2007; Widaman, 2009; Deon et al., 2015).

PKU is produced by a single allele, or pair of genes. As shown in Figure 2-4, we can label each gene of the pair with a *P* if it carries a dominant gene, which causes the normal production of phenylalanine, or a *p* if it carries the recessive gene that produces PKU. In cases in which neither parent is a PKU carrier, both the mother's and the father's pairs of genes are the dominant form, symbolized as *PP* (Figure 2-4a). Consequently, no matter which member of the pair is contributed by the mother and father, the resulting pair of genes in the child will be *PP*, and the child will not have PKU.

Consider, however, what happens if one of the parents has a recessive *p* gene. In this case, which we can symbolize as *Pp*, the parent will not have PKU, since the normal *P* gene is dominant. But the recessive gene can be passed down to the child (Figure 2-4b). This is not so bad: if the child has only one recessive gene, it will not suffer from PKU. But what if both parents carry a recessive *p* gene (Figure 2-4c)? In this case, although neither parent has the disorder, it is possible for the child to receive a recessive gene from both parents. The child's genotype for PKU then will be *pp*, and he or she will have the disorder.

Remember, though, that even children whose parents both have the recessive gene for PKU have only a 25 percent chance of inheriting the disorder. Due to the laws of probability, 25 percent of children with *Pp* parents will receive the dominant gene from each parent (these children's genotype would be *PP*) and 50 percent will receive the dominant gene from one parent and the recessive gene from the other (their genotypes would be either *Pp* or *pP*). Only the unlucky 25 percent who receive the recessive gene from each parent and end up with the genotype *pp* will suffer from PKU.

POLYGENIC TRAITS. The transmission of PKU is a good way of illustrating the basic principles of how genetic information passes from parent to child, although the case of PKU is simpler than most cases of genetic transmission. Relatively few traits are governed by a single pair of genes. Instead, most traits are the result of polygenic inheritance. In **polygenic inheritance**, a combination of multiple gene pairs is responsible for the production of a particular trait.

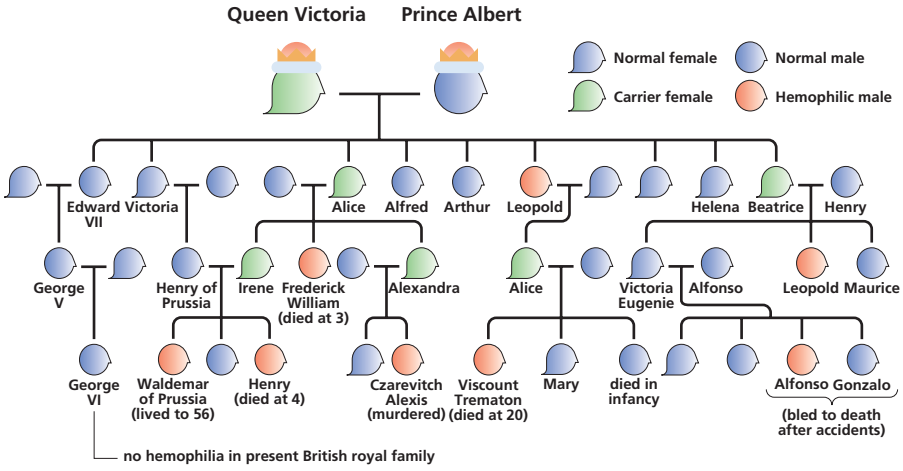
polygenic inheritance
inheritance in which a combination of multiple gene pairs is responsible for the production of a particular trait.

Furthermore, some genes come in several alternate forms, and still others act to modify the way that particular genetic traits (produced by other alleles) are displayed. Genes also vary in terms of their *reaction range*, the potential degree of variability in the actual

Figure 2-5 Inheriting Hemophilia

Hemophilia, a blood-clotting disorder, has been an inherited problem throughout the royal families of Europe, as illustrated by the descendants of Queen Victoria of Britain.

(Source: Kimball, John W., Biology, 5th Ed., © 1983. Reprinted and Electronically reproduced by permission of Pearson Education, Inc., Upper Saddle River, New Jersey.)



expression of a trait due to environmental conditions. And some traits, such as blood type, are produced by genes in which neither member of a pair of genes can be classified as purely dominant or recessive. Instead, the trait is expressed in terms of a combination of the two genes—such as type AB blood.

A number of recessive genes, called **X-linked genes**, are located only on the X chromosome. Recall that in females, the twenty-third pair of chromosomes is an XX pair, while in males it is an XY pair. One result is that males have a higher risk for a variety of X-linked disorders, since males lack a second X chromosome that can counteract the genetic information that produces the disorder. For example, males are significantly more apt to have red–green color blindness, a disorder produced by a set of genes on the X chromosome.

X-linked genes
genes that are considered recessive and located only on the X chromosome.

Similarly, *hemophilia*, a blood disorder, is produced by X-linked genes. Hemophilia has been a recurrent problem in the royal families of Europe, as illustrated in Figure 2-5, which shows the inheritance of hemophilia in the descendants of Queen Victoria of Great Britain.

The Human Genome and Behavioral Genetics: Cracking the Genetic Code

LO 2.5 Describe the field of behavioral genetics.

Mendel's achievements in recognizing the basics of genetic transmission of traits were trailblazing. However, they mark only the beginning of our understanding of how those particular characteristics are passed on from one generation to the next.

The most recent milestone in understanding genetics was reached in early 2001, when molecular geneticists succeeded in mapping the specific sequence of genes on each chromosome. This accomplishment stands as one of the most important moments in the history of genetics, and, for that matter, all of biology (International Human Genome Sequencing Consortium, 2001).

Already, the mapping of the gene sequence has provided important advances in our understanding of genetics. For instance, the number of human genes, long thought to be 100,000, has been revised downward to 25,000—not many more than for organisms

Table 2-1 Current Understanding of the Genetic Basis of Selected Behavioral Disorders and Traits

Behavioral Trait	Current Beliefs about Genetic Basis
Huntington's disease	Huntington gene localized to the terminal portion of the short arm of chromosome 4.
Obsessive-Compulsive Disorder (OCD)	Several potentially relevant genes have been identified but additional research is needed to verify.
Fragile X mental retardation	Two genes identified.
Early onset (familial) Alzheimer's disease	Three distinct genes identified. Most cases caused by single-gene mutation on chromosomes 21, 14, and 1.
Attention deficit hyperactivity disorder (ADHD)	Evidence in some studies has linked ADHD with dopamine-receptor D4 and D5 genes, but the complexity of the disease makes it difficult to identify a specific gene.
Alcoholism	Research suggests that genes affecting the activity of the neurotransmitters serotonin and GABA likely are involved in risk for alcoholism.
Schizophrenia spectrum disorder	There is no agreement, but links to chromosomes 1, 5, 6, 10, 13, 15, and 22 have been reported.

(**Source:** Based on McGuffin, Riley, & Plomin, 2001).

that are far less complex than the human (see Figure 2-6). Furthermore, scientists have discovered that all humans share 99.9 percent of the gene sequence. What this means is that we humans are far more similar to one another than we are different. It also indicates that many of the differences that seemingly separate people—such as race—are, literally, only skin-deep. The mapping of the human genome will also help identify particular disorders to which a given individual is susceptible (Levenson, 2012; Goldman & Domschke, 2014).

The mapping of the human gene sequence is supporting the field of behavioral genetics. As the name implies, **behavioral genetics** studies the effects of heredity on behavior and psychological characteristics. Rather than simply examining stable, unchanging characteristics such as hair or eye color, behavioral genetics takes a broader approach, considering how our personality and behavioral habits are affected by genetic factors (Eley, Lichtenstein, & Moffitt, 2003; Li, 2003; Judge, Ilies, & Zhang, 2012).

behavioral genetics
the study of the effects of heredity on behavior and psychological characteristics.

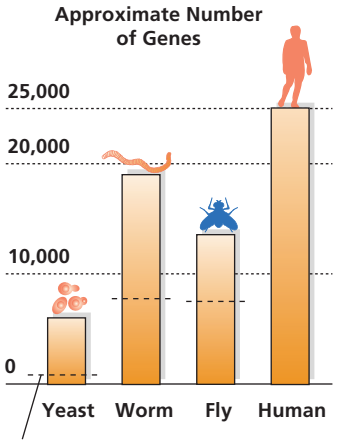
Personality traits such as shyness or sociability, moodiness, and assertiveness are among the areas being studied. Other behavior geneticists study psychological disorders, such as major depressive disorder, attention-deficit/hyperactivity disorder, and schizophrenia spectrum disorder, looking for possible genetic links (DeYoung, Quilty, & Peterson, 2007; Haeffel et al., 2008; Wang et al., 2012; see Table 2-1).

Behavioral genetics holds substantial promise. For one thing, researchers working within the field have gained a better understanding of the specifics of the genetic code that underlies human behavior and development.

Even more important, researchers are seeking to identify how genetic defects may be remedied (Peltonen & McKusick, 2001; Bleidorn, Kandler, & Caspi, 2014). To understand how a remedial possibility might come about, we need to consider the ways in which genetic factors, which normally cause development to proceed so smoothly, may falter.

Figure 2-6 Uniquely Human?
Humans have about 25,000 genes, making them not much more genetically complex than some primitive species.

(**Source:** Celera Genomics: International Human Genome Sequencing Consortium, 2001.)



Estimated percentage of each creature's genes with human counterparts.

Inherited and Genetic Disorders: When Development Deviates from the Norm

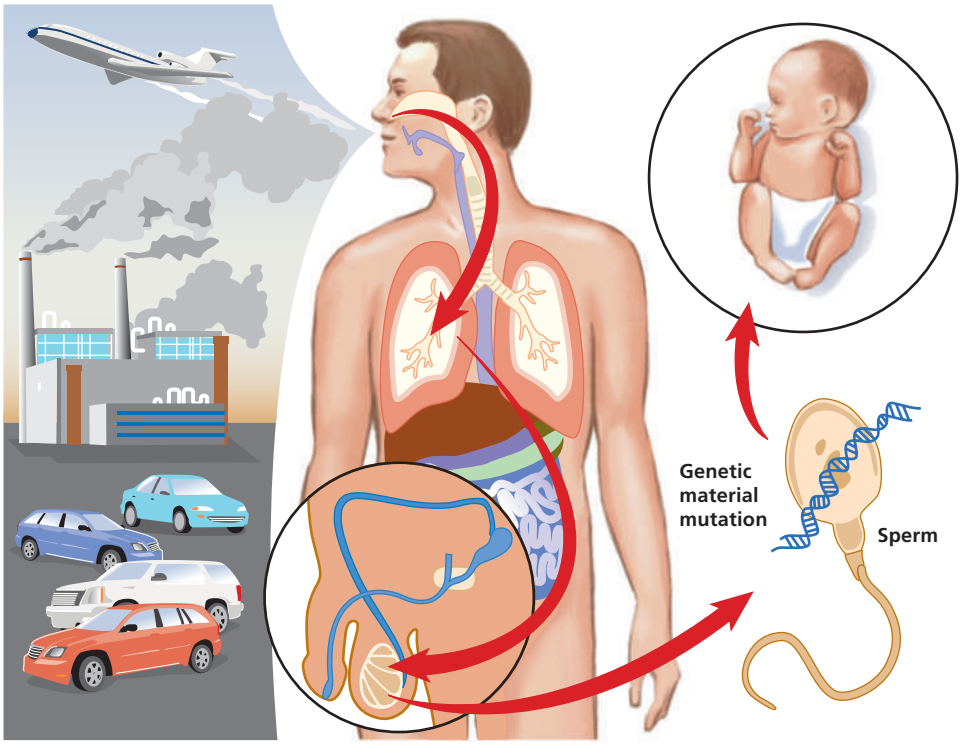
LO 2.6 Describe the major inherited disorders.

PKU is just one of several disorders that may be inherited. Like a bomb that is harmless until its fuse is lit, a recessive gene responsible for a disorder may be passed on unknowingly from one generation to the next, revealing itself only when, by chance, it is paired with another recessive gene. It is only when two recessive genes come together like a match and a fuse that the gene will express itself and a child will inherit the genetic disorder.

Figure 2-7 Inhaled Air and Genetic Mutations

Inhalation of unhealthy, polluted air may lead to mutations in genetic material in sperm. These mutations may be passed on, damaging the fetus and affecting future generations.

(Source: Based on Samet, DeMarini, & Malling, 2004, p. 971.)



But there is another way that genes are a source of concern: in some cases, genes become physically damaged. For instance, genes may break down due to wear and tear or chance events occurring during the cell division processes of meiosis and mitosis. Sometimes genes, for no known reason, spontaneously change their form, a process called *spontaneous mutation*.

Alternatively, certain environmental factors, such as exposure to X-rays or even highly polluted air, may produce a malformation of genetic material (see Figure 2-7). When such damaged genes are passed on to a child, the results can be disastrous in terms of future physical and cognitive development (Samet, DeMarini, & Malling, 2004; Tucker-Drob, & Briley, 2014).

In addition to PKU, which occurs once in 10,000 to 20,000 births, other inherited and genetic disorders include:

- **Down syndrome.** As noted earlier, most people have 46 chromosomes, arranged in 23 pairs. One exception is individuals with **Down syndrome**, a disorder produced by the presence of an extra chromosome on the twenty-first pair. Once referred to as mongolism, Down syndrome is the most frequent cause of mental retardation. It occurs in about 1 out of 700 births, although the risk is much greater in mothers who are unusually young or old (Sherman et al., 2007; Davis, 2008; Channell et al., 2014).
- **Fragile X syndrome.** **Fragile X syndrome** occurs when a particular gene is injured on the X chromosome. The result is mild to moderate mental retardation (Cornish, Turk, & Hagerman, 2008; Hocking, Kogan, & Cornish, 2012).
- **Sickle-cell anemia.** Around one-tenth of people of African descent carry genes that produce sickle-cell anemia, and 1 in 400 actually has the disease. **Sickle-cell anemia** is a blood disorder that gets its name from the shape of the red blood cells in those who have it. Symptoms include poor appetite, stunted growth, a swollen stomach,

Down syndrome
a disorder produced by the presence of an extra chromosome on the twenty-first pair; once referred to as mongolism.

fragile X syndrome
a disorder produced by injury to a gene on the X chromosome, producing mild to moderate mental retardation.

sickle-cell anemia
a blood disorder that gets its name from the shape of the red blood cells in those who have it.

Sickle-cell anemia, named for the presence of misshapen red blood cells, is carried in the genes of 1 in 10 African Americans.

Tay-Sachs disease
a disorder that produces blindness and muscle degeneration prior to death; there is no treatment.

Klinefelter's syndrome
a disorder resulting from the presence of an extra X chromosome that produces underdeveloped genitals, extreme height, and enlarged breasts.

and yellowish eyes. People afflicted with the most severe form of the disease rarely live beyond childhood. However, for those with less severe cases, medical advances have produced significant increases in life expectancy.

- **Tay-Sachs disease.** Occurring mainly in Jews of Eastern European ancestry and in French-Canadians, **Tay-Sachs disease** usually causes death before its victims reach school age. There is no treatment for the disorder, which produces blindness and muscle degeneration prior to death.
- **Klinefelter's syndrome.** One male out of every 500 is born with **Klinefelter's syndrome**, the presence of an extra X chromosome. The resulting XXY complement produces underdeveloped genitals, extreme height, and enlarged breasts. Klinefelter's syndrome is one of a number of genetic abnormalities that result from receiving the improper number of sex chromosomes. For instance, there are disorders produced by an extra Y chromosome (XYY), a missing second chromosome (X0, called *Turner syndrome*), and three X chromosomes (XXX). Such disorders are typically characterized by problems relating to sexual characteristics and by intellectual deficits (Murphy & Mazzocco, 2008; Murphy, 2009; Hong et al., 2014).

It is important to keep in mind that the mere fact that a disorder has genetic roots does not mean that environmental factors do not also play a role (Moldin & Gottesman, 1997). Consider, for instance, sickle-cell anemia, which primarily afflicts people of African descent. Because the disease can be fatal in childhood, we'd expect that those who suffer from it would be unlikely to live long enough to pass it on. This does seem to be true, at least in the United States: compared with parts of West Africa, the incidence in the United States is much lower.

But why shouldn't the incidence of sickle-cell anemia also be gradually reduced for people in West Africa? This question proved puzzling for many years, until scientists determined that carrying the sickle-cell gene raises immunity to malaria, which is a common disease in West Africa. This heightened immunity meant that people with the sickle-cell gene had a genetic advantage (in terms of resistance to malaria) that offset, to some degree, the disadvantage of being a carrier of the sickle-cell gene.

The lesson of sickle-cell anemia is that genetic factors are intertwined with environmental considerations and can't be looked at in isolation. Furthermore, we need to remember that although we've been focusing on inherited factors that can go awry, in the vast majority of cases the genetic mechanisms with which we are endowed work quite well. Overall, 95 percent of children born in the United States are healthy and normal. For the some 250,000 who are born each year with some sort of physical or mental disorder, appropriate intervention often can help treat and, in some cases, cure the problem.

Moreover, due to advances in behavioral genetics, genetic difficulties increasingly can be forecast, anticipated, and planned for before a child's birth, enabling parents to take steps before the child is born to reduce the severity of certain genetic conditions. In fact, as scientists' knowledge regarding the specific location of particular genes expands, predictions of what the genetic future may hold are becoming increasingly exact, as we discuss next.

Genetic Counseling: Predicting the Future from the Genes of the Present

LO 2.7 **Describe the role of genetic counselors and differentiate between different forms of prenatal testing.**

genetic counseling
the discipline that focuses on helping people deal with issues relating to inherited disorders.

If you knew that your mother and grandmother had died of Huntington's disease—a devastating, always fatal inherited disorder marked by tremors and intellectual deterioration—to whom could you turn to learn your own chances of coming down with the disease? The best person to turn to would be a member of a field that, just a few decades ago, was nonexistent: genetic counseling. **Genetic counseling** focuses on helping people deal with issues relating to inherited disorders.

Genetic counselors use a variety of data in their work. For instance, couples contemplating having a child may seek to determine the risks involved in a future pregnancy. In such a case, a counselor will take a thorough family history, seeking any familial incidence of birth defects that might indicate a pattern of recessive or X-linked genes. In addition, the counselor will take into account factors such as the age of the mother and father and any previous abnormalities in other children they may have already had (Resta et al., 2006; Lyon, 2012; O'Doherty, 2014).

Typically, genetic counselors suggest a thorough physical examination. Such an exam may identify physical abnormalities that potential parents may have and not be aware of. In addition, samples of blood, skin, and urine may be used to isolate and examine specific chromosomes. Possible genetic defects, such as the presence of an extra sex chromosome, can be identified by assembling a *karyotype*, a chart containing enlarged photos of each of the chromosomes.

WATCH THIS VIDEO ON MYPSYCHLAB GENETIC COUNSELING

PRENATAL TESTING. A variety of techniques can be used to assess the health of an unborn child if a woman is already pregnant (see Table 2-2 for a list of currently available tests). The earliest test is a *first-trimester screen*, which combines a blood test and ultrasound sonography in the eleventh to thirteenth week of pregnancy and can identify chromosomal abnormalities and other disorders, such as heart problems. In **ultrasound sonography**, high-frequency sound waves bombard the mother's womb. These waves produce a rather indistinct, but useful, image of the unborn baby, whose size and shape can then be assessed. Repeated use of ultrasound sonography can reveal developmental patterns. Although the accuracy of blood tests and ultrasound in identifying abnormalities is not high early in pregnancy, it becomes more accurate later on.

ultrasound sonography
a process in which high-frequency sound waves scan the mother's womb to produce an image of the unborn baby, whose size and shape can then be assessed.

chorionic villus sampling (CVS)
a test used to find genetic defects that involves taking samples of hair-like material that surrounds the embryo.

A more invasive test, **chorionic villus sampling (CVS)**, can be employed in the tenth to thirteenth week of the first trimester if blood tests and ultrasound have identified a potential problem or if there is a family history of inherited disorders. CVS involves inserting a thin needle into the fetus and taking small samples of hair-like material that surrounds the embryo. The test can be done between the eighth and eleventh week of pregnancy. However, it produces a risk of miscarriage of 1 in 100 to 1 in 200. Because of the risk, its use is relatively infrequent.

Table 2-2 Fetal Development Monitoring Techniques

Technique	Description
Amniocentesis	Done between the fifteenth and twentieth week of pregnancy, this procedure examines a sample of the amniotic fluid, which contains fetal cells. Recommended if either parent carries Tay-Sachs, spina bifida, sickle-cell, Down syndrome, muscular dystrophy, or Rh disease.
Chorionic villus sampling (CVS)	Done at 8 to 11 weeks, either transabdominally or transcervically, depending on where the placenta is located. Involves inserting a needle (abdominally) or a catheter (cervically) into the substance of the placenta but staying outside the amniotic sac and removing 10 to 15 milligrams of tissue. This tissue is manually cleaned of maternal uterine tissue and then grown in culture, and a karyotype is made, as with amniocentesis.
Embryoscopy	Examines the embryo or fetus during the first 12 weeks of pregnancy by means of a fiber-optic endoscope inserted through the cervix. Can be performed as early as week 5. Access to the fetal circulation may be obtained through the instrument, and direct visualization of the embryo permits the diagnosis of malformations.
Fetal blood sampling (FBS)	Performed after 18 weeks of pregnancy by collecting a small amount of blood from the umbilical cord for testing. Used to detect Down syndrome and most other chromosome abnormalities in the fetuses of couples who are at increased risk of having an affected child. Many other diseases can be diagnosed using this technique.
Sonoembryology	Used to detect abnormalities in the first trimester of pregnancy. Involves high-frequency transvaginal probes and digital image processing. In combination with ultrasound, it can detect more than 80 percent of all malformations during the second trimester.
Sonogram	Uses ultrasound to produce a visual image of the uterus, fetus, and placenta.
Ultrasound sonography	Uses very high frequency sound waves to detect structural abnormalities or multiple pregnancies, measure fetal growth, judge gestational age, and evaluate uterine abnormalities. Also used as an adjunct to other procedures, such as amniocentesis.

In amniocentesis, a sample of fetal cells is withdrawn from the amniotic sac and used to identify a number of genetic defects.

amniocentesis
the process of identifying genetic defects by examining a small sample of fetal cells drawn by a needle inserted into the amniotic fluid surrounding the unborn fetus.

In **amniocentesis**, a small sample of fetal cells is drawn by a tiny needle inserted into the amniotic fluid surrounding the unborn fetus. Carried out 15 to 20 weeks into the pregnancy, amniocentesis allows analysis of the fetal cells that can identify a variety of genetic defects with nearly 100 percent accuracy. In addition, the sex of the child can be determined. Although there is always a danger to the fetus in an invasive procedure such as amniocentesis, it is generally safe, with the risk of miscarriage 1 in 200 to 1 in 400.

After the various tests are complete and all possible information is available, the couple will meet with the genetic counselor again. Typically, counselors avoid giving specific recommendations. Instead, they lay out the facts and present various options, ranging from doing nothing to taking more drastic steps, such as terminating the pregnancy through abortion. Ultimately, it is the parents who must decide what course of action to follow.

SCREENING FOR FUTURE PROBLEMS. The newest role of genetic counselors involves testing people to identify whether they themselves, rather than their children, are susceptible to future disorders because of genetic abnormalities. For instance, Huntington's disease typically does not appear until people reach their 40s. However, genetic testing can identify much earlier whether a person carries the flawed gene that produces Huntington's disease. Presumably, people's knowledge that they carry the gene can help them prepare themselves for the future (Cina & Fellmann, 2006; Tibben, 2007; Sánchez-Castañeda et al., 2015).

From the perspective of *a health-care provider*

What are some ethical and philosophical questions that surround the issue of genetic counseling? Might it sometimes be unwise to know ahead of time about possible genetically linked disorders that might afflict your child or yourself?

In addition to Huntington's disease, more than a thousand disorders can be predicted on the basis of genetic testing (see Table 2-3). Although such testing may bring welcome relief from) future worries—if the results are negative—positive results may produce just the opposite effect. In fact, genetic testing raises difficult practical and ethical questions (Human Genome Project, 2006; Twomey, 2006; Wilfond & Ross, 2009; Klitzman, 2012).

Suppose, for instance, a woman who thought she was susceptible to Huntington's disease was tested in her 20s and found that she did not carry the defective gene. Obviously, she would experience tremendous relief. But suppose she found that she did carry the flawed gene and was therefore going to get the disease. In this case, she might well experience depression or anger. In fact, some studies show that 10 percent of people who find they have the flawed gene that leads to Huntington's disease never recover fully on an emotional level (Hamilton, 1998; Myers, 2004; Wahlin, 2007).

Genetic testing clearly is a complicated issue. It rarely provides a simple yes or no answer as to whether an individual will be susceptible to a disorder. Instead, typically it presents a range of probabilities. In some cases, the likelihood of actually becoming ill depends on the type of environmental stressors to which a person is exposed. Personal differences also affect a given person's susceptibility to a disorder (Bonke et al., 2005; Lucassen, 2012; Crozier & Robertson, 2015). (Also see the *From Research to Practice* box.)

As our understanding of genetics continues to grow, researchers and medical practitioners have moved beyond testing and counseling to actively working to change flawed genes. The possibilities for genetic intervention and manipulation increasingly border on what once was science fiction—as we consider next.

ARE "DESIGNER BABIES" IN OUR FUTURE?

Adam Nash was born to save his older sister Molly's life—literally. Molly was suffering from a rare disorder called Fanconi anemia, which meant that her bone marrow was failing to produce blood cells. This disease can have devastating effects on young children, includ-

Table 2-3 Some Currently Available DNA-Based Genetic Tests

Disease	Description
Alzheimer's disease	Late-onset variety of senile dementia
Amyotrophic lateral sclerosis (Lou Gehrig's disease)	Progressive motor function loss leading to paralysis and death
Breast and ovarian cancer (inherited)	Early-onset tumors of breasts and ovaries
Charcot–Marie–Tooth	Loss of feeling in ends of limbs
Cystic fibrosis	Thick mucus accumulations in lungs and chronic infections in lungs and pancreas
Duchenne muscular dystrophy (Becker muscular dystrophy)	Severe to mild muscle wasting, deterioration, weakness
Dystonia	Muscle rigidity, repetitive twisting movements
Fragile X syndrome	Mental retardation
Hemophilia A and B	Bleeding disorders
Hereditary nonpolyposis colon cancer[a]	Early-onset tumors of colon and sometimes other organs
Huntington's disease	Progressive neurological degeneration, usually beginning in midlife
Myotonic dystrophy	Progressive muscle weakness
Neurofibromatosis, type 1	Multiple benign nervous system tumors that can be disfiguring; cancers
Phenylketonuria	Progressive mental retardation due to missing enzyme; correctable by diet
Sickle-cell disease	Blood cell disorder, chronic pain and infections
Spinal muscular atrophy	Severe, usually lethal progressive muscle-wasting disorder in children
Tay-Sachs disease	Seizures, paralysis, fatal neurological disease of early childhood

[a]These are susceptibility tests that provide only an estimated risk for developing the disorder.
(**Source:** Human Genome Project, 2010, http://www.ornl.gov/sci/techresources/Human_Genome/medicine/genetest.shtml.)

ing birth defects and certain cancers. Many don't survive to adulthood. Molly's best hope for overcoming this disease was to grow healthy bone marrow by receiving a transplant of immature blood cells from the placenta of a newborn sibling. But not just any sibling would do—it had to be one with compatible cells that would not be rejected by Molly's immune system. So Molly's parents turned to a new and risky technique that had the potential to save Molly by using cells from her unborn brother.

Molly's parents were the first to use a genetic screening technique called *preimplantation genetic diagnosis* (*PGD*) to ensure that their next child would be free of Fanconi anemia. With PGD, a newly fertilized embryo can be screened for a variety of genetic diseases before it is implanted in the mother's uterus to develop. Doctors fertilized several of Molly's mother's eggs with her husband's sperm in a test tube. They then examined the embryos to ensure that they would only implant the embryo that PGD revealed to be both genetically healthy and a match for Molly. When Adam was born nine months later, Molly got a new lease on life, too: the transplant was a success, and Molly was cured of her disease.

Molly's parents and their doctors also opened a controversial new chapter in genetic engineering involving the use of advances in reproductive medicine that give parents a degree of prenatal control over the traits of their children. Another procedure that makes this level of genetic control possible is *germ line therapy*, in which cells are taken from an embryo and then replaced after the defective genes they contain have been repaired.

While PGD and germ line therapy have important uses in the prevention and treatment of serious genetic disorders, concerns have been raised over whether such scientific advances can lead to the development of "designer babies"—infants that have been genetically manipulated to have traits their parents wish for. The question is whether these procedures can and should be used not only to correct undesirable genetic defects, but also to breed infants for specific purposes or to "improve" future generations on a genetic level.

From Research to Practice

Prenatal Screenings Are Not Diagnoses

When Stacie Chapman's obstetrician recommended a routine genetic screening for her unborn child, she really didn't give it much thought. She was nearly three months into her pregnancy, and she knew that her age put her at greater risk of having a child with a genetic abnormality. Testing made sense, and didn't seem to have any downside.

But when the results came back positive for Edwards syndrome, a very serious and usually fatal genetic disorder caused by an extra 18th chromosome, Stacie was beside herself. She and her husband immediately decided to terminate the pregnancy rather than bring to term an infant who would almost certainly have only a few painful days to live (Daley, 2014).

However, what the Chapmans didn't understand was that the genetic screening, based on a simple blood test, could not definitively diagnose this condition in their unborn child. It was not meant to do that. Their confusion was understandable, given that their obstetrician explained that the test had a 99 percent detection rate. But this degree of accuracy referred only to its ability to detect the potential for a problem if one was in fact there; left unclear was that the test also often detected potential problems that turned out not to be there. In fact, for older pregnant women, screenings for Edwards syndrome return a false positive about 36 percent of the time (and they're even worse for younger women, returning a false positive about 60 percent of the time). More invasive procedures are required to actually diagnose the prenatal condition (Lau et al., 2012; Allison, 2013; Daley, 2014).

These unregulated screenings, which were originally intended for use with high-risk patients, are increasingly being marketed to all pregnant women. Many believe that not enough is being done to ensure that women (and their doctors) understand what a positive result truly signifies and the probability that it is false. Industry research shows that some women are terminating their pregnancies based solely on a positive screening result without confirmation—and at least some of those cases turn out to have been healthy fetuses.

No one questions that prenatal screening for genetic abnormalities is beneficial, but it's clear that physicians and patients must understand how to interpret the results and should consult with a genetic specialist before making any important decisions based on a test result (Weaver, 2013; Guggenmos, 2015).

Shared Writing Prompt

What would you tell a friend who just received a positive test result for the genetic disorder of Tay-Sachs?

The ethical concerns are numerous: is it right to tailor babies to serve a specific purpose, however noble? Does this kind of genetic control pose any dangers to the human gene pool? Would unfair advantages be conferred on the offspring of those who are wealthy or privileged enough to have access to these procedures (Sheldon & Wilkinson, 2004; Landau, 2008; Drmanac, 2012)?

Designer babies aren't with us yet; scientists do not yet understand enough about the human genome to identify the genes that control most traits, much less to make genetic modifications to control how those traits will be expressed. Still, as Adam Nash's case reveals, we are inching closer to a day when it is possible for parents to decide what genes their children will and will not have.

Module 2.1 Review

- In humans, the male sex cell (the sperm) and the female sex cell (the ovum) provide the developing baby with 23 chromosomes each.
- Monozygotic twins are twins who are genetically identical. Dizygotic twins are two separate ova that are fertilized by two separate sperm at roughly the same time.
- When an ovum and sperm meet at the moment of fertilization, the ovum provides an X chromosome, while the sperm provides either an X or a Y chromosome. If the sperm contributes its X chromosome, the child will have an XX pairing and will be a girl. If the sperm contributes a Y chromosome, the result will be an XY pairing—a boy.
- A genotype is the underlying combination of genetic material present in an organism, but invisible; a phenotype is the visible trait, the expression of the genotype.
- The field of behavioral genetics, a combination of psychology and genetics, studies the effects of genetics on behavior and psychological characteristics.
- Several inherited and genetic disorders are due to damaged or mutated genes.
- Genetic counselors use a variety of data and techniques to advise future parents of possible genetic risks to their unborn children. A variety of techniques can be used to assess the health of an unborn child if a woman is already pregnant, including ultrasound, CVS, and amniocentesis.

Journal Writing Prompt

Applying Lifespan Development: How can the field of behavioral genetics help researchers understand the differences between people's personalities?

The Interaction of Heredity and Environment

Like many other parents, Jared's mother, Leesha, and his father, Jamal, tried to figure out which one of them their new baby resembled the most. He seemed to have Leesha's big, wide eyes and Jamal's generous smile. As he grew, Jared grew to resemble his mother and father even more. His hair grew in with a hairline just like Leesha's, and his teeth, when they came, made his smile resemble Jamal's even more. He also seemed to act like his parents. For example, he was a charming little baby, always ready to smile at people who visited the house—just like his friendly, jovial dad. He seemed to sleep like his mom, which was lucky since Jamal was an extremely light sleeper who could do with as little as four hours a night, while Leesha liked a regular seven or eight hours.

Were Jared's ready smile and regular sleeping habits something he just luckily inherited from his parents? Or did Jamal and Leesha provide a happy and stable home that encouraged these welcome traits? What causes our behavior? Nature or nurture? Is behavior produced by inherited, genetic influences, or is it triggered by factors in the environment?

The simple answer is: there is no simple answer.

The Role of the Environment in Determining the Expression of Genes: From Genotypes to Phenotypes

LO 2.8 Explain how the environment and genetics work together to determine human characteristics.

As developmental research accumulates, it is becoming increasingly clear that to view behavior as due to *either* genetic *or* environmental factors is inappropriate. A given behavior is not caused just by genetic factors, nor is it caused solely by environmental forces. Instead,as we first discussed in Chapter 1, the behavior is the product of some combination of the two.

temperament
patterns of arousal and emotionality that represent consistent and enduring characteristics in an individual.

For instance, consider **temperament**, patterns of arousal and emotionality that represent consistent and enduring characteristics in an individual. Suppose we found—as increasing evidence suggests is the case—that a small percentage of children are born with temperaments that produce an unusual degree of physiological reactivity. Having a tendency to shrink from anything unusual, such infants react to novel stimuli with a rapid increase in heartbeat and unusual excitability of the limbic system of the brain. Such heightened reactivity to stimuli at the start of life, which seems to be linked to inherited factors, is also likely to cause children, by the time they are four or five, to be considered shy by their parents and teachers. But not always: some of them behave indistinguishably from their peers at the same age (Kagan & Snidman, 1991; McCrae et al., 2000).

What makes the difference? The answer seems to be the environment in which the children are raised. Children whose parents encourage them to be outgoing by arranging new opportunities for them may overcome their shyness. In contrast, children raised in a stressful environment marked by marital discord or a prolonged illness may be more likely to retain their shyness later in life (Kagan, Arcus, & Snidman, 1993; Propper & Moore, 2006; Bridgett et al., 2009; Casalin et al., 2012). Jared, described earlier, may have been born with an easy temperament, which was easily reinforced by his caring parents.

multifactorial transmission
the determination of traits by a combination of both genetic and environmental factors in which a genotype provides a range within which a phenotype may be expressed.

INTERACTION OF FACTORS. Such findings illustrate that many traits reflect **multifactorial transmission**, meaning that they are determined by a combination of both genetic and environmental factors. In multifactorial transmission, a genotype provides a particular range within which a phenotype may achieve expression. For instance,

people with a genotype that permits them to gain weight easily may never be slim, no matter how much they diet. They may be *relatively* slim, given their genetic heritage, but they may never be able to get beyond a certain degree of thinness (Faith, Johnson, & Allison, 1997). In many cases, then, it is the environment that determines the way in which a particular genotype will be expressed as a phenotype (Plomin, 1994; Wachs, 1992, 1993, 1996).

On the other hand, certain genotypes are relatively unaffected by environmental factors. In such cases, development follows a preordained pattern, relatively independent of the specific environment in which a person is raised. For instance, research on pregnant women who were severely malnourished during famines caused by World War II found that their children were, on average, unaffected physically or intellectually as adults (Stein et al., 1975). Similarly, no matter how much health food people eat, they are not going to grow beyond certain genetically imposed limitations in height. Little Jared's hairline was probably affected very little by any actions on the part of his parents.

Ultimately, of course, it is the unique interaction of inherited and environmental factors that determines people's patterns of development.

The more appropriate question, then, is *how much* of the behavior is caused by genetic factors, and *how much* by environmental factors? (See, for example, the range of possibilities for the determinants of intelligence, illustrated in Figure 2-8.) At one extreme is the idea that opportunities in the environment are solely responsible for intelligence; on the other, that intelligence is purely genetic—you either have it or you don't. The usefulness of such extremes seems to be that they point us toward the middle ground—that intelligence is the result of some combination of natural mental ability and environmental opportunity.

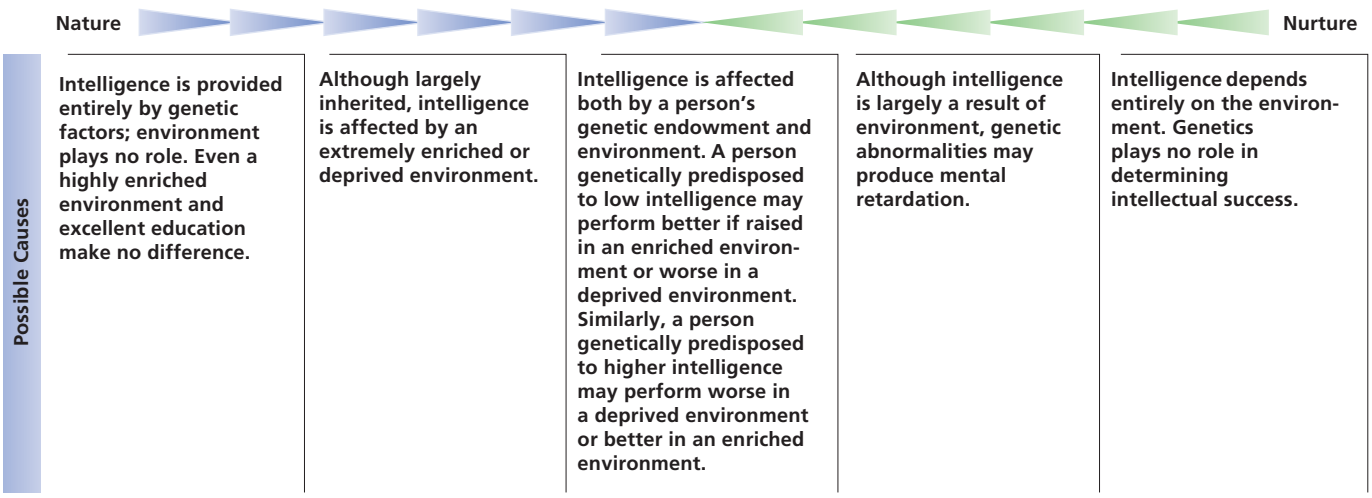
Studying Development: How Much Is Nature? How Much Is Nurture?

LO 2.9 Summarize how researchers study the interaction of genetic and environmental factors in development.

Developmental researchers use several strategies to try to resolve the question of the degree to which traits, characteristics, and behavior are produced by genetic or environmental factors. Their studies involve both nonhuman species and humans.

Figure 2-8 Possible Sources of Intelligence

Intelligence may be explained by a range of differing possible sources, spanning the nature–nurture continuum. Which of these explanations do you find most convincing, given the evidence discussed in the chapter?



NONHUMAN ANIMAL STUDIES: CONTROLLING BOTH GENETICS AND ENVIRONMENT. It is relatively simple to develop breeds of animals that are genetically similar to one another in terms of specific traits. The people who raise Butterball turkeys for Thanksgiving do it all the time, producing turkeys that grow especially rapidly so that they can be brought to market inexpensively. Likewise, strains of laboratory animals can be bred to share similar genetic backgrounds.

By observing animals with similar genetic backgrounds in different environments, scientists can determine, with reasonable precision, the effects of specific kinds of environmental stimulation. For example, animals can be raised in unusually stimulating environments, with lots of items to climb over or through, or they can be raised in relatively barren environments, to determine the results of living in such different settings. Conversely, researchers can examine groups of animals that have been bred to have significantly *different* genetic backgrounds on particular traits. Then, by exposing such animals to identical environments, they can determine the role of genetic background.

WATCH THIS VIDEO ON MYPSYCHLAB
THE BASICS: GENETIC MECHANISMS AND BEHAVIORAL GENETICS

Of course, the drawback to using nonhumans as research subjects is that we can't be sure how well the findings we obtain can be generalized to people. Still, animal research offers substantial opportunities.

CONTRASTING RELATEDNESS AND BEHAVIOR: ADOPTION, TWIN, AND FAMILY STUDIES. Obviously, researchers can't control either the genetic backgrounds or the environments of humans in the way they can with nonhumans. However, nature conveniently has provided the potential to carry out various kinds of "natural experiments"—in the form of twins.

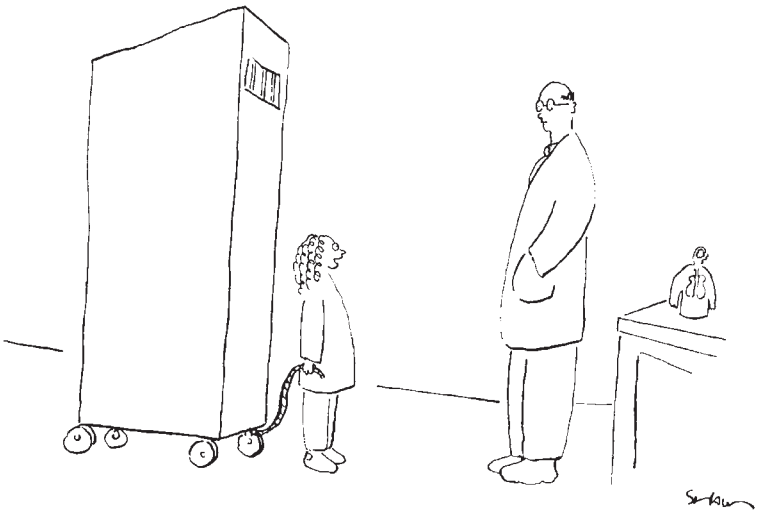
Recall that identical, monozygotic twins are also identical genetically. Because their inherited backgrounds are precisely the same, any variations in their behavior must be due entirely to environmental factors.

It would be rather simple for researchers to make use of identical twins to draw unequivocal conclusions about the roles of nature and nurture. For instance, by separating identical twins at birth and placing them in totally different environments, researchers could assess the impact of environment unambiguously. Of course, ethical considerations make this impossible. What researchers can—and do—study, however, are cases in which identical twins have been put up for adoption at birth and are raised in substantially different environments. Such instances allow us to draw fairly confident conclusions about the relative contributions of genetics and environment (Richardson & Norgate, 2007; Agrawal & Lynskey, 2008; Nikolas, Klump, & Burt, 2012).

The data from such studies of identical twins raised in different environments are not always without bias. Adoption agencies typically take the characteristics (and wishes) of birth mothers into account when they place babies in adoptive homes. For instance, children tend to be placed with families of the same race and religion. Consequently, even when monozygotic twins are placed in different adoptive homes, there are often similarities between the two home environments. As a result, researchers cannot always be certain that differences in behavior are due to differences in the environment.

Studies of nonidentical dizygotic twins also present opportunities to learn about the relative contributions of nature and nurture. Recall that dizygotic twins are genetically no more similar than siblings in a family born at different times. By comparing behavior within pairs of dizygotic twins with that of pairs of monozygotic twins (who are genetically identical), researchers can determine whether monozygotic twins are more similar in a particular trait, on average, than dizygotic twins. If so, they can assume that genetics plays an important role in determining the expression of that trait.

Still another approach is to study people who are totally unrelated to one another and who therefore have dissimilar genetic backgrounds, but who share an



"The title of my science project is 'My Little Brother: Nature or Nurture.'"

environmental background. For instance, a family that adopts, at the same time, two very young unrelated children probably will provide them with quite similar environments throughout their childhood. In this case, similarities in the children's characteristics and behavior can be attributed with some confidence to environmental influences (Segal, 2000).

Finally, developmental researchers have examined groups of people in light of their degree of genetic similarity. For instance, if we find a high association on a particular trait between biological parents and their children, but a weaker association between adoptive parents and their children, we have evidence for the importance of genetics in determining the expression of that trait. On the other hand, if there is a stronger association on a trait between adoptive parents and their children than between biological parents and their children, we have evidence for the importance of the environment in determining that trait. If a particular trait tends to occur at similar levels among genetically similar individuals but occurs at different levels among genetically more distant individuals, signs point to the fact that genetics plays an important role in the development of that trait.

Developmental researchers have used all these approaches, and more, to study the relative impact of genetic and environmental factors. What have they found?

Before turning to specific findings, here's the general conclusion resulting from decades of research. Virtually all traits, characteristics, and behaviors are the joint result of the combination and interaction of nature and nurture. Genetic and environmental factors work in tandem, each affecting and being affected by the other, creating the unique individual that each of us is and will become (Robinson, 2004; Waterland & Jirtle, 2004).

Genetics and the Environment: Working Together

LO 2.10 Explain how genetics and the environment jointly influence physical traits, intelligence, and personality.

Let's look at ways in which genetics and the environment influence our physical traits, intelligence, and personality.

PHYSICAL TRAITS: FAMILY RESEMBLANCES. When patients entered the examining room of Dr. Cyril Marcus, they didn't realize that sometimes they were actually being treated by his identical twin brother, Dr. Stewart Marcus. So similar in appearance and manner were the twins that even longtime patients were fooled by this admittedly unethical behavior, which occurred in a bizarre case made famous in the film *Dead Ringers*.

Monozygotic twins are merely the most extreme example of the fact that the more genetically similar two people are, the more likely they are to share physical characteristics. Tall parents tend to have tall children, and short ones tend to have short children. Obesity, which is defined as being more than 20 percent above the average weight for a given height, also has a strong genetic component. For example, in one study, pairs of identical twins were put on diets that contained an extra 1,000 calories a day—and ordered not to exercise. Over a three-month period, the twins gained almost identical amounts of weight. Moreover, different pairs of twins varied substantially in how much weight

they gained, with some pairs gaining almost three times as much weight as other pairs (Bouchard et al., 1990).

Other, less obvious physical characteristics also show strong genetic influences. For instance, blood pressure, respiration rates, and even the age at which life ends are more similar in closely related individuals than in those who are less genetically alike (Price & Gottesman, 1991; Melzer, Hurst, & Frayling, 2007).

INTELLIGENCE: MORE RESEARCH, MORE CONTROVERSY. No other issue involving the relative influence of heredity and environment has generated more research than the topic of intelligence. Why? The main reason is that intelligence, generally measured in terms of an IQ score, is a central human characteristic that differentiates humans from other species. In addition, intelligence is strongly related to success in scholastic endeavors and, somewhat less strongly, to other types of achievement.

Genetics plays a significant role in intelligence. In studies of both overall or general intelligence and of specific subcomponents of intelligence (such as spatial skills, verbal skills, and memory), as can be seen in Figure 2-9, the closer the genetic link between two individuals, the greater the correspondence of their overall IQ scores.

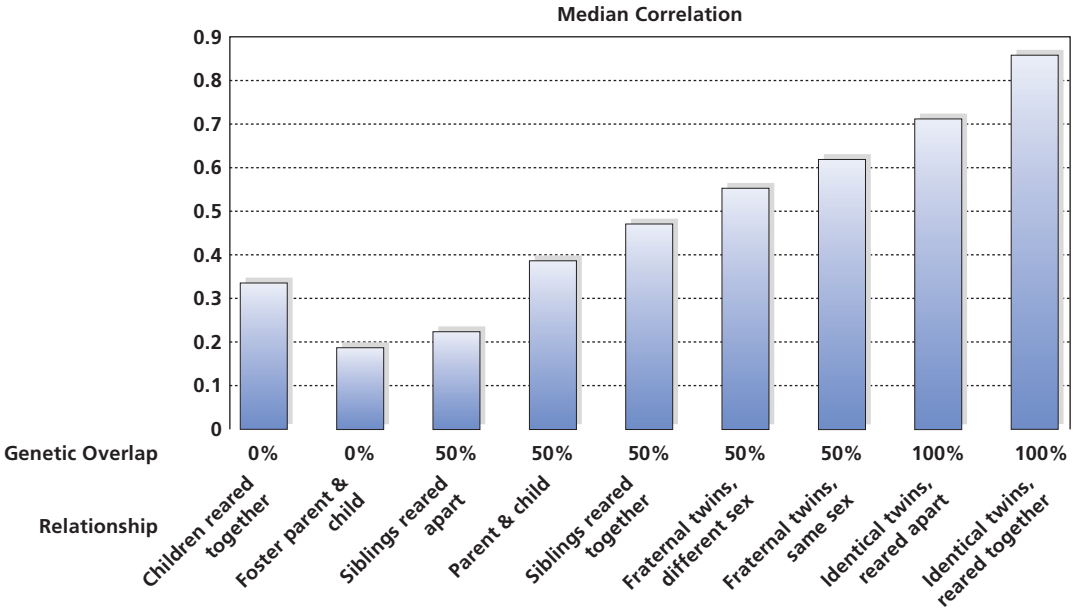
Not only is genetics an important influence on intelligence, but the impact increases with age. For instance, as fraternal (i.e., dizygotic) twins move from infancy to adolescence, their IQ scores become less similar. In contrast, the IQ scores of identical (monozygotic) twins become increasingly similar over the course of time. These opposite patterns suggest the intensifying influence of inherited factors with increasing age (Brody, 1993; McGue et al., 1993; Silventoinen et al., 2012).

Although it is clear that heredity plays an important role in intelligence, investigators are much more divided on the question of the degree to which it is inherited. Perhaps the most extreme view is held by psychologist Arthur Jensen (2003), who argued that as much as 80 percent of intelligence is a result of heredity. Others have suggested more modest figures, ranging from 50 to 70 percent. It is critical to keep in mind that such figures are averages across large groups of people, and any particular individual degree of inheritance cannot be predicted from these averages (e.g., Herrnstein & Murray, 1994; Brouwer et al., 2014).

Figure 2-9 Genetics and IQ

The closer the genetic link between two individuals, the greater the correspondence between their IQ scores. Why do you think there is a sex difference in the fraternal twins' figures? Might there be other sex differences in other sets of twins or siblings, not shown on this chart?

(Source: Based on Bouchard & McGue, 1981.)



It is important to keep in mind that although heredity clearly plays an important role in intelligence, environmental factors such as exposure to books, good educational experiences, and intelligent peers are profoundly influential. Even those like Jensen who make the most extreme estimates of the role of genetics still allow for environmental factors to play a significant role. In terms of public policy, environmental influences are the focus of efforts geared toward maximizing people's intellectual success. As developmental psychologist Sandra Scarr suggests, we should be asking what can be done to maximize the intellectual development of each individual (Scarr & Carter-Saltzman, 1982; Storfer, 1990; Bouchard, 1997).

From *an educator's* perspective

Some people have used the proven genetic basis of intelligence to argue against strenuous educational efforts on behalf of individuals with below-average IQs. Does this viewpoint make sense based on what you have learned about heredity and environment? Why or why not?

GENETIC AND ENVIRONMENTAL INFLUENCES ON PERSONALITY: BORN TO BE OUTGOING? Do we inherit our personality? At least in part. There's increasing research evidence suggesting that some of our most basic personality traits have genetic roots. For example, two of the key "Big Five" personality traits, neuroticism and extroversion, have been linked to genetic factors. *Neuroticism*, as used by personality researchers, is the degree of emotional stability an individual characteristically displays. *Extroversion* is the degree to which a person seeks to be with others, to behave in an outgoing manner, and generally to be sociable. For instance, Jared, the baby described earlier in this chapter, may have inherited a tendency to be outgoing from his extroverted father, Jamal (Benjamin, Ebstein, & Belmaker, 2002; Zuckerman, 2003; Horwitz, Luong, & Charles, 2008).

How do we know which personality traits reflect genetics? Some evidence comes from direct examination of genes themselves. For instance, a specific gene is very influential in determining risk-taking behavior. This novelty-seeking gene affects the production of the brain chemical dopamine, making some people more prone than others to seek out novel situations and to take risks (Serretti et al., 2007; Ray et al., 2009; Veselka et al., 2012).

Other evidence for the role of genetics in determining personality traits comes from studies of twins. For instance, in one major study, researchers looked at the personality traits of hundreds of pairs of twins. Because a good number of the twins were genetically identical but had been raised apart, it was possible to determine with some confidence the influence of genetic factors (Tellegen et al., 1988). The researchers found that certain traits reflected the contribution of genetics considerably more than others. As you can see in Figure 2-10, social potency (the tendency to be a masterful, forceful leader who enjoys being the center of attention) and traditionalism (strict endorsement of rules and authority) are strongly associated with genetic factors (Harris, Vernon, & Jang, 2007; South et al., 2015).

Although genetic factors clearly play a significant role in the development of intelligence, the level of environmental enrichment is also crucial.

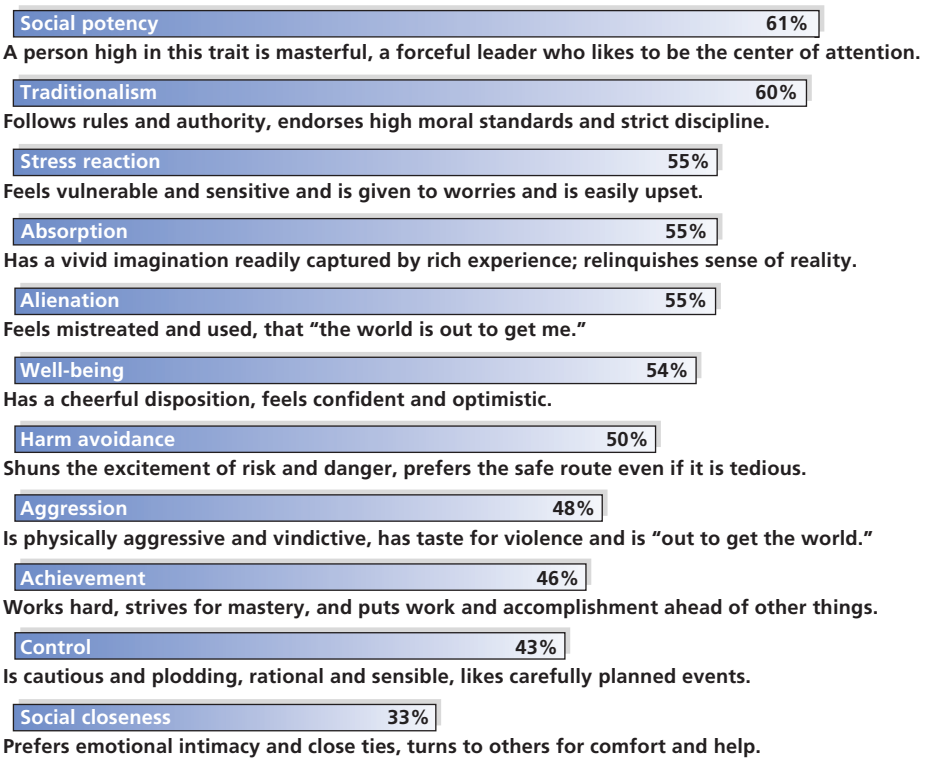
Even less basic personality traits are linked to genetics. For example, political attitudes, religious interests and values, and even attitudes toward human sexuality have genetic components (Bouchard, 2004; Koenig et al., 2005; Bradshaw & Ellison, 2008; Kandler, Bleidorn, & Riemann, 2012).

Clearly, genetic factors play a role in determining personality. At the same time, the environment in which a child is raised also affects personality development. For example, some

Figure 2-10 Inheriting Traits

These traits are among the personality factors that are related most closely to genetic factors. The higher the percentage, the greater the degree to which the trait reflects the influence of heredity. Do these figures mean that "leaders are born, not made"? Why or why not?

(Source: Adapted from Tellegen et al., 1988.)



parents encourage high activity levels, seeing activity as a manifestation of independence and intelligence. Other parents may encourage lower levels of activity in their children, feeling that more passive children will get along better in society. These parental attitudes are in part culturally determined; parents in the United States may encourage higher activity levels, while parents in Asian cultures may encourage greater passivity. In both cases, children's personalities will be shaped in part by their parents' attitudes (Cauce, 2008).

Because both genetic and environmental factors have consequences for a child's personality, personality development is a perfect example of a central fact of child development: nature and nurture are closely intertwined. Furthermore, the way in which nature and nurture interact can be reflected not just in the behavior of individuals, but in the very foundations of a culture, as we see next.

Psychological Disorders: The Role of Genetics and Environment

LO 2.11 Explain the role genetics and the environment play in the development of psychological disorders.

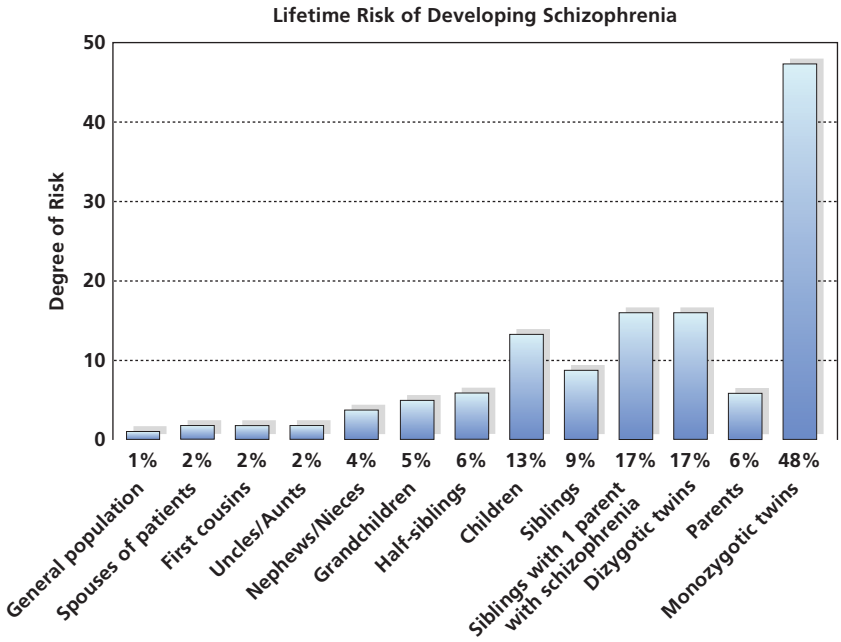
> *When Elani Dimitrios turned 13, her cat, Mefisto, began to give her orders. At first the orders were harmless: "Wear two different socks to school" or "Eat out of a bowl on the floor." Her parents dismissed these events as signs of a vivid imagination, but when Elani approached her little brother with a hammer, her mother intervened forcibly. Elani later recalled, "I heard the order very clearly: Kill him, kill him. It was as if I was possessed."*

In a sense, she *was* possessed: possessed with *schizophrenia spectrum disorder*, one of the most severe types of psychological disorders (typically referred to more simply as *schizophrenia*). Normal and happy through childhood, Elani increasingly lost her hold on reality as she entered adolescence. For the next two decades, she would be in and out of

Figure 2-11 The Genetics of Schizophrenia

The psychological disorder of schizophrenia has clear genetic components. The closer the genetic links between someone with schizophrenia and another family member, the more likely it is that the other person will also develop schizophrenia.

(Source: Based on Gottesman, 1991.)



institutions, struggling to ward off the ravages of the disorder.

What was the cause of Elani's mental disorder? Increasing evidence suggests that schizophrenia is brought about by genetic factors. The disorder runs in families, with some families showing an unusually high incidence. Moreover, the closer the genetic links between someone with schizophrenia and another family member, the more likely it is that the other person will also develop schizophrenia. For instance, a monozygotic twin has close to a 50 percent risk of developing schizophrenia when the other twin develops the disorder (see Figure 2-11). On the other hand, a niece or nephew of a person with schizophrenia has less than a 5 percent chance of developing the disorder (Hanson & Gottesman, 2005; Mitchell, K. J.; Porteous, 2011; van Haren et al., 2012).

These data also illustrate that genetics alone does not influence the development of the disorder. If genetics were the sole cause, the risk for an identical twin would be 100 percent. Consequently, other factors account for the disorder, ranging from structural abnormalities in the brain to a biochemical imbalance (e.g., Lyons, Bar, & Kremen, 2002; Hietala, Cannon, & van Erp, 2003; Howes & Kapur, 2009; Wada et al., 2012).

It also seems that even if individuals harbor a genetic predisposition toward schizophrenia, they are not destined to develop the disorder. Instead, they may inherit an unusual sensitivity to stress in the environment. If stress is low, schizophrenia will not occur. But if stress is sufficiently strong, it will lead to schizophrenia. At the same time, for someone with a strong genetic predisposition toward the disorder, even relatively weak environmental stressors may lead to schizophrenia (Norman & Malla, 2001; Mittal, Ellman, & Cannon, 2008; Walder et al., 2014).

Several other psychological disorders have been shown to be related, at least in part, to genetic factors. For instance, major depressive disorders, alcoholism, autism spectrum disorder, and attention-deficit/hyperactivity disorder have significant inherited components (Dick, Rose, & Kaprio, 2006; Monastra, 2008; Burbach & van der Zwaag, 2009).

The example of schizophrenia spectrum disorder and other genetically related psychological disorders also illustrates a fundamental principle regarding the relationship between heredity and environment, a principle that underlies much of our previous discussion. Specifically, the role of genetics is often to produce a tendency toward a future course of development. When and whether a certain behavioral characteristic will actually be displayed depends on the nature of the environment. Thus, although a predisposition for schizophrenia may be present at birth, typically people do not show the disorder until adolescence—if at all.

Similarly, certain other kinds of traits are more likely to be displayed as the influence of parents and other socializing factors declines. For example, adopted children may, early in their lives, display traits that are relatively similar to their adoptive parents' traits, given the overwhelming influence of the environment on young children. As they get older and their parents' day-to-day influence declines, genetically influenced traits may begin to manifest themselves as unseen genetic factors begin to play a greater role (Caspi & Moffitt, 1993; Arsenault et al., 2003; Poulton & Caspi, 2005).

Developmental Diversity and Your Life

Cultural Differences in Physical Arousal: Might a Culture's Philosophical Outlook Be Determined by Genetics?

The Buddhist philosophy, an inherent part of many Asian cultures, emphasizes harmony and peacefulness. In contrast, some traditional Western philosophies, such as those of Martin Luther and John Calvin, accentuate the importance of controlling the anxiety, fear, and guilt that they assume to be basic parts of the human condition.

Could such philosophical approaches reflect, in part, genetic factors? That is the controversial suggestion made by developmental psychologist Jerome Kagan and his colleagues. They speculate that the underlying temperament of a given society, determined genetically, may predispose people in that society toward a particular philosophy (Kagan, Arcus, & Snidman, 1993; Kagan, 2003).

Kagan bases his admittedly speculative suggestion on well-confirmed findings that show clear differences in temperament between Caucasian and Asian children. For instance, one study that compared four-month-old infants in China, Ireland, and the United States found several relevant differences. In comparison to the Caucasian American babies and the Irish babies, the Chinese babies had significantly lower motor activity, irritability, and vocalization (see Table 2-4).

Kagan suggests that the Chinese, who enter the world temperamentally calmer, may find Buddhist philosophical notions of serenity more in tune with their natural inclinations. In contrast, Westerners, who are emotionally more volatile and tense, and who report higher levels of guilt, are more likely to be attracted to philosophies that articulate the necessity of controlling the unpleasant feelings that they are more apt to encounter in their everyday experience (Kagan et al., 1994; Kagan, 2003).

It is important to note that this does not mean that one philosophical approach is necessarily better or worse than the other. Nor does it mean that either of the temperaments from which the philosophies are thought to spring is superior or inferior to the other. Similarly, we must remember that any single individual within a culture can be more or less temperamentally volatile and that the range of temperaments found even within a particular culture is vast. Finally, as noted in our initial discussion of temperament, environmental conditions can have a significant effect on the portion of a person's temperament that is not genetically determined. But what Kagan and his colleagues' speculation does attempt to address is the back-and-forth-interchange between culture and temperament. As religion may help mold temperament, so may temperament make certain religious ideals more attractive.

The notion that the very basis of culture—its philosophical traditions—may be affected by genetic factors is intriguing. More research is necessary to determine just how the unique interaction of heredity and environment within a given culture may produce a framework for viewing and understanding the world.

The Buddhist philosophy emphasizes harmony and peacefulness. Could this decidedly non-Western philosophy be caused, in part, by genetics?

Table 2-4 Mean Behavioral Scores for Caucasian American, Irish, and Chinese 4-Month-Old Infants

Behavior	American	Irish	Chinese
Motor activity	48.6	36.7	11.2
Crying (in seconds)	7.0	2.9	1.1
Fretting (% trials)	10.0	6.0	1.9
Vocalizing (% trials)	31.4	31.1	8.1
Smiling (% trials)	4.1	2.6	3.6

(**Source:** Kagan, Arcus, & Snidman, 1993.)

Can Genes Influence the Environment?

LO 2.12 Describe ways in which genes influence the environment.

According to developmental psychologist Sandra Scarr (1993, 1998), the genetic endowment provided to children by their parents not only determines their genetic characteristics but also actively influences their environment. Scarr suggests three ways a child's genetic predisposition might influence his or her environment.

Children tend to actively focus on those aspects of their environment that are most connected with their genetically determined abilities. For example, an active, more aggressive child will gravitate toward sports, while a more reserved child will be more engaged by academics or solitary pursuits such as computer games or drawing. Children also pay less attention to those aspects of the environment that are less compatible with their genetic endowment. For instance, two girls may be reading the same school bulletin board. One may notice the sign advertising tryouts for Little League baseball, while her less coordinated but more musically endowed friend might be more apt to spot the notice recruiting students for an after-school chorus. In each case, the child is attending to those aspects of the environment in which her genetically determined abilities can flourish.

In some cases, the gene–environment influence is more passive and less direct. For example, a particularly sports-oriented parent, who has genes that promote good physical coordination, may provide many opportunities for a child to play sports.

Finally, the genetically driven temperament of a child may *evoke* certain environmental influences. For instance, an infant's demanding behavior may cause parents to be more attentive to the infant's needs than they would be if the infant were less demanding. Or, for instance, a child who is genetically inclined to be well coordinated may play ball with anything in the house so often that her parents notice. They may then decide that she should have some sports equipment.

In sum, determining whether behavior is primarily attributable to nature or nurture is a bit like shooting at a moving target. Not only are behaviors and traits a joint outcome of genetic and environmental factors, but the relative influence of genes and environment for specific characteristics shifts over the course of people's lives. Although the pool of genes we inherit at birth sets the stage for our future development, the constantly shifting scenery and the other characters in our lives determine just how our development eventually plays out. The environment both influences our experiences and is molded by the choices we are temperamentally inclined to make.

Module 2.2 Review

- Human characteristics and behavior often reflect multifactorial transmission, meaning that they are a joint outcome of genetic and environmental factors.
- Developmental researchers use a number of strategies to examine the extent to which traits and behavior are due to genetic factors or environmental factors. Strategies include animal studies and research on twins, adopted siblings, and families.
- Genetic influences have been identified in physical characteristics, intelligence, and personality traits and behaviors. Environmental factors, such as family dispositions and habits, also play a role in such traits as intelligence and personality.
- Schizophrenia spectrum disorder has strong genetic roots. Other disorders, including major depressive disorder, alcoholism, autism spectrum disorder, and attention-deficit/hyperactivity disorder, have genetic components as well, but environmental influences also contribute.
- Children may influence their environment through genetic traits that cause them to construct—or influence their parents to construct—an environment that matches their inherited dispositions and preferences.

Journal Writing Prompt

Applying Lifespan Development: Do you share any personality traits with one of your parents? Do think that being raised in a different environment (such as moving to a different region within your country or moving to a different country) would have affected this?

Prenatal Growth and Change

Robert accompanied Lisa to her first appointment with the midwife. The midwife checked the results of tests done to confirm the couple's own positive home pregnancy test. "Yep, you're going to have a baby," she confirmed, speaking to Lisa. "You'll need to set up monthly visits for the next six months, then more frequently as your due date approaches. You can get this prescription for prenatal vitamins filled at any pharmacy, and here are some guidelines about diet and exercise. You don't smoke, do you? That's good." Then she turned to Robert. "How about you? Do you smoke?" After giving lots of instructions and advice, she left the couple feeling slightly dazed but ready to do whatever they could to have a healthy baby.

From the moment of conception, development proceeds relentlessly. As we've seen, many aspects are guided by the complex set of genetic guidelines inherited from the parents. Of course, prenatal growth, like all development, is also influenced from the start by environmental factors (Leavitt & Goldson, 1996). As we'll see, both parents, like Lisa and Robert, can take part in providing a good prenatal environment.

Fertilization: The Moment of Conception

LO 2.13 Explain the process of fertilization.

When most of us think about the facts of life, we tend to focus on the events that cause a male's sperm cells to begin their journey toward a female's ovum. Yet the act of sex that brings about the potential for conception is both the consequence and the start of a long string of events that precede and follow **fertilization**, or conception: the joining of sperm and ovum to create the single-celled zygote from which life begins.

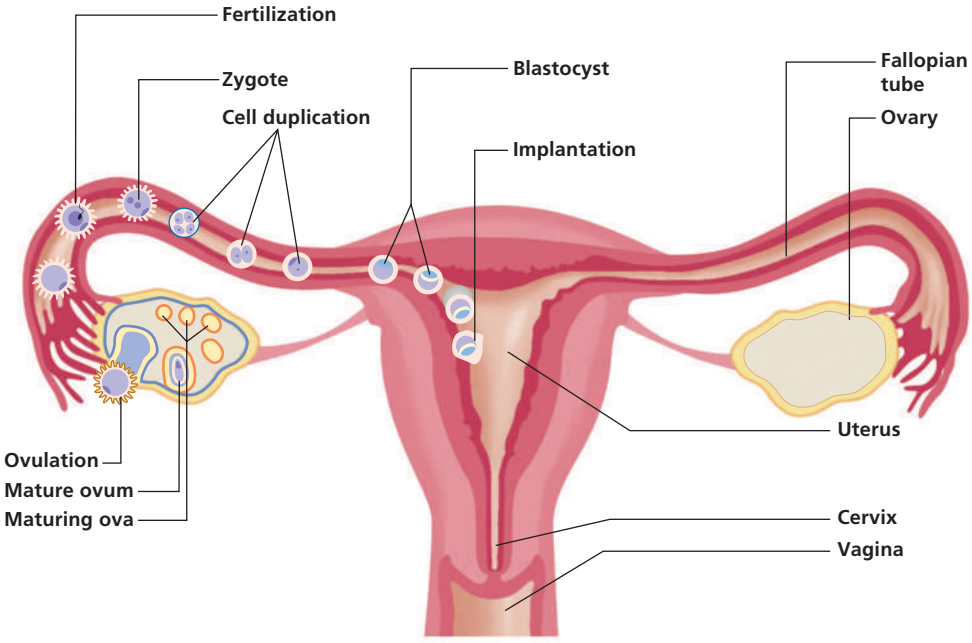
fertilization
the process by which a sperm and an ovum—the male and female gametes, respectively—join to form a single new cell.

Both the male's sperm and the female's ovum come with a history of their own. Females are born with around 400,000 ova located in the two ovaries (see Figure 2-12 for the basic anatomy of the female reproductive organs). However, the ova do not mature until the female reaches puberty. From that point until she reaches menopause, the female

Figure 2-12 Anatomy of the Female Reproductive Organs

The basic anatomy of the female reproductive organs is illustrated in this cutaway view.

(Source: Based on Moore & Persaud, 2003.)



will ovulate about every 28 days. During ovulation, an egg is released from one of the ovaries and pushed by minute hair cells through the fallopian tube toward the uterus. If the ovum meets a sperm in the fallopian tube, fertilization takes place (Aitken, 1995).

Sperm, which look a little like microscopic tadpoles, have a shorter life span. They are created by the testicles at a rapid rate: an adult male typically produces several hundred million sperm a day. Consequently, the sperm ejaculated during sexual intercourse are of considerably more recent origin than the ovum to which they are heading.

When sperm enter the vagina, they begin a winding journey that takes them through the cervix, the opening into the uterus, and into the fallopian tube, where fertilization may take place. However, only a tiny fraction of the 300 million cells that are typically ejaculated during sexual intercourse ultimately survive the arduous journey. That's usually okay, though: it takes only one sperm to fertilize an ovum, and each sperm and ovum contains all the genetic data necessary to produce a new human.

The Stages of the Prenatal Period: The Onset of Development

LO 2.14 Summarize the three stages of prenatal development.

The prenatal period consists of three stages: the germinal, embryonic, and fetal stages. They are summarized in Table 2-5.

germinal stage
the first—and shortest—stage of the prenatal period, which takes place during the first two weeks following conception.

THE GERMINAL STAGE: FERTILIZATION TO 2 WEEKS. In the **germinal stage**, the first—and shortest—stage of the prenatal period, the zygote begins to divide and grow in complexity during the first two weeks following conception. During the germinal stage, the fertilized egg (now called a *blastocyst*) travels toward the *uterus*, where it becomes implanted in the uterus's wall, which is rich in nutrients. The germinal stage is characterized by methodical cell division, which gets off to a quick start: three days after fertilization, the organism consists of some 32 cells, and by the next day the number doubles. Within a week, it is made up of 100 to 150 cells, and the number rises with increasing rapidity.

placenta
a conduit between the mother and fetus, providing nourishment and oxygen via the umbilical cord.

In addition to increasing in number, the cells of the organism become increasingly specialized. For instance, some cells form a protective layer around the mass of cells, while others begin to establish the rudiments of a placenta and umbilical cord. When fully developed, the **placenta** serves as a conduit between the mother and fetus, providing nourishment and oxygen via the *umbilical cord*, which also removes waste materials from the developing child. The placenta also plays a role in fetal brain development (Kalb, 2012).

embryonic stage
the period from two to eight weeks following fertilization during which significant growth occurs in the major organs and body systems.

THE EMBRYONIC STAGE: 2 WEEKS TO 8 WEEKS. By the end of the germinal period—just two weeks after conception—the organism is firmly secured to the wall of the mother's uterus. At this point, the child is called an *embryo*. The **embryonic stage** is the period from two to eight weeks following fertilization. One of the highlights of this stage is the development of the major organs and basic anatomy.

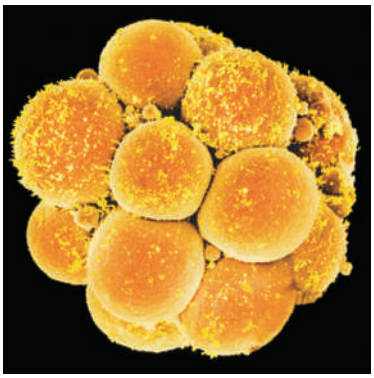
Table 2-5 Stages of the Prenatal Period

Germinal Fertilization to 2 Weeks	Embryonic 2 Weeks to 8 Weeks	Fetal 8 Weeks to Birth
The germinal stage is the first and shortest, characterized by methodical cell division and the attachment of the organism to the wall of the uterus. Three days after fertilization, the zygote consists of 32 cells, a number that doubles by the next day. Within a week, the zygote multiplies to 100 to 150 cells. The cells become specialized, with some forming a protective layer around the zygote.	The zygote is now designated an embryo. The embryo develops three layers, which ultimately form a different set of structures as development proceeds. The layers are as follows: Ectoderm: skin, hair teeth, sense organs, brain, spinal cord Endoderm: digestive system, liver, pancreas, respiratory system Mesoderm: muscles, bones, blood, circulatory system At 8 weeks, the embryo is 1 inch long.	The fetal stage formally starts when the differentiation of the major organs has occurred. Now called a fetus, the individual grows rapidly as length increases 20 times. At 4 months, the fetus weighs an average of 4 ounces; at 7 months, 3 pounds; and at the time of birth, the average child weighs just over 7 pounds.

At the beginning of the embryonic stage, the developing child has three distinct layers, each of which will ultimately form a different set of structures as development proceeds. The outer layer of the embryo, the *ectoderm*, will form skin, hair, teeth, sense organs, and the brain and spinal cord. The *endoderm*, the inner layer, produces the digestive system, liver, pancreas, and respiratory system. Sandwiched between the ectoderm and endoderm is the *mesoderm*, from which the muscles, bones, blood, and circulatory system are forged. Every part of the body is formed from these three layers.

If you were looking at an embryo at the end of the embryonic stage, you might be hard-pressed to identify it as human. Only an inch long, an 8-week-old embryo has what appear to be gills and a tail-like structure. On the other hand, a closer look reveals several familiar features. Rudimentary eyes, nose, lips, and even teeth can be recognized, and the embryo has stubby bulges that will form arms and legs.

The head and brain undergo rapid growth during the embryonic period. The head begins to represent a significant proportion of the embryo's size, encompassing about 50 percent of its total length. The growth of nerve cells, called *neurons*, is astonishing: as many as 100,000 neurons are produced every minute during the second month of life! The nervous system begins to function around the fifth week, and weak brain waves begin to be produced as the nervous system starts to function (Lauter, 1998; Nelson & Bosquet, 2000).



The germinal stage of the prenatal period gets off to a fast start. Here, the embryo has divided into 16 cells soon after fertilization.

THE FETAL STAGE: 8 WEEKS TO BIRTH. It is not until the final period of prenatal development, the fetal stage, that the developing child becomes easily recognizable. The **fetal stage** starts at about eight weeks after conception and continues until birth. The fetal stage formally starts when the differentiation of the major organs has occurred.

fetal stage

the stage that begins at about eight weeks after conception, and continues until birth.

Now called a **fetus**, the developing child undergoes astoundingly rapid change during the fetal stage. For instance, it increases in length some 20 times, and its proportions change dramatically. At two months, around half the fetus is what will ultimately be its head; by five months, the head accounts for just over a quarter of its total size (see Figure 2-13). The fetus also substantially increases in weight. At four months, the fetus weighs an average of about four ounces; at seven months, it weighs about three pounds; and at the time of birth the average child weighs just over seven pounds.

fetus

a developing child, from eight weeks after conception until birth.

At the same time, the developing child is rapidly becoming more complex. Organs become more differentiated and start to work. By three months, for example, the fetus swallows and urinates. In addition, the interconnections between the different parts of the body become more complex and integrated. Arms develop hands; hands develop fingers; fingers develop nails.

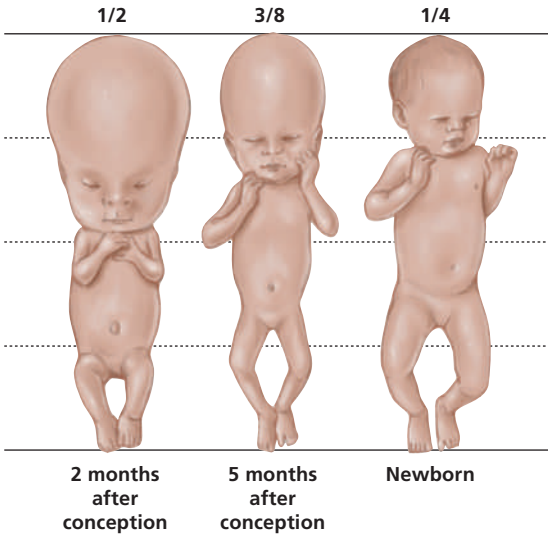
As this is happening, the fetus makes itself known to the outside world. In the earliest stages of pregnancy, mothers may be unaware that they are, in fact, pregnant. As the fetus becomes increasingly active, however, most mothers certainly take notice. By four months, a mother can feel the movement of her child, and several months later others can feel the baby's kicks through the mother's skin. In addition to the kicks that alert its mother to its presence, the fetus can turn, do somersaults, cry, hiccup, clench its fist, open and close its eyes, and suck its thumb.

The brain becomes increasingly sophisticated during the fetal stage. The two symmetrical left and right halves of the brain, known as *hemispheres*, grow rapidly, and the interconnections between neurons become more complex. The neurons become coated with an insulating material called *myelin* that helps speed the transmission of messages from the brain to the rest of the body.

By the end of the fetal period, brain waves are produced that indicate the fetus passes through different stages of sleep and wakefulness. The fetus is also able to hear (and feel the vibrations of) sounds to which it is exposed. For instance, researchers Anthony DeCasper and Melanie Spence (1986) asked a group of pregnant mothers to read aloud the

Figure 2-13 Body Proportions

During the fetal stage, the proportions of the body change dramatically. At two months, the head represents about half the fetus, but by the time of birth, it is one-quarter of its total size.



(a) 

(b) 

(c) 

(a) The fetal stage begins at eight weeks following conception. (b) This fetus, shown at around five months after conception, looks distinctly human. (c) As with adults, there are broad differences in the nature of fetuses. Some are very active while others are more reserved, characteristics that they can carry over after birth.

Dr. Seuss story *The Cat in the Hat* two times a day during the later months of pregnancy. Three days after the babies were born, they appeared to recognize the story they had heard, responding more to it than to another story that had a different rhythm.

In weeks 8 to 24 following conception, hormones are released that lead to the increasing differentiation of male and female fetuses. For example, high levels of androgen are produced in males that affect the size of brain cells and the growth of neural connections, which, some scientists speculate, ultimately may lead to differences in male and female brain structure and even later variations in gender-related behavior (Reiner & Gearhart, 2004; Knickmeyer & Baron-Cohen, 2006; Burton et al., 2009; Jordan-Young, 2012).

Just as no two adults are alike, no two fetuses are the same. Although development during the prenatal period follows the broad patterns outlined here, there are significant differences in the specific nature of individual fetuses' behavior. Some fetuses are exceedingly active, while others are more sedentary. (The more active fetuses will probably be more active after birth.) Some have relatively quick heart rates, while others' heart rates are slower, with the typical range varying between 120 and 160 beats per minute (DiPietro et al., 2002; Niederhofer, 2004; Tongsong et al., 2005).

Such differences in fetal behavior are due in part to genetic characteristics inherited at the moment of fertilization. Other kinds of differences, though, are brought about by the nature of the environment in which the child spends its first nine months of life. As we will see, there are numerous ways in which the prenatal environment of infants affects their development—in good ways and bad.

Pregnancy Problems

LO 2.15 Describe some of the physical and ethical challenges that relate to pregnancy.

For some couples, conception presents a major challenge. Let's consider some of the challenges—both physical and ethical—that relate to pregnancy.

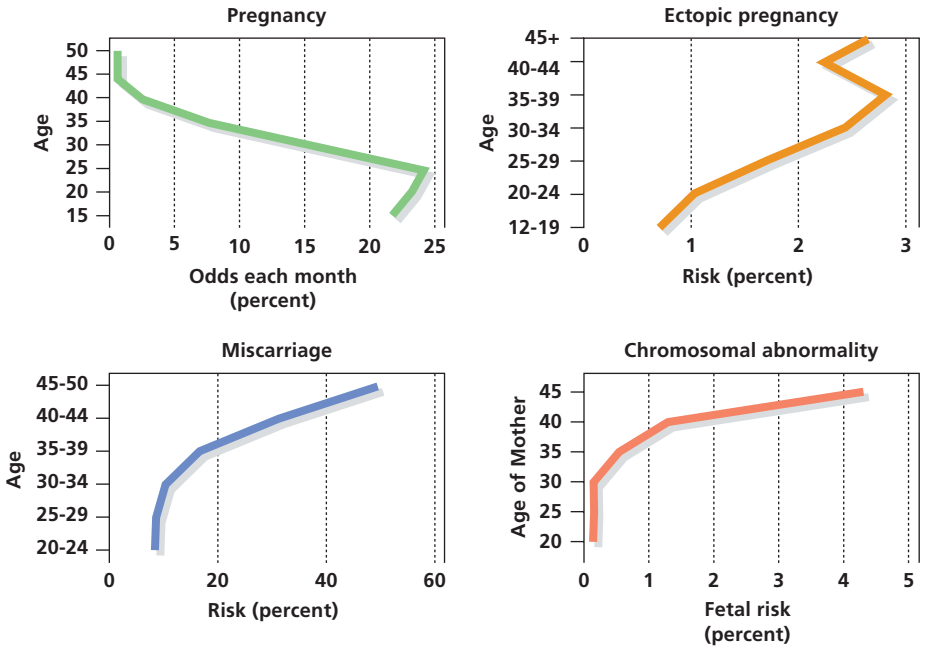
infertility
the inability to conceive after 12 to 18 months of trying to become pregnant.

INFERTILITY. Some 15 percent of couples suffer from **infertility**, the inability to conceive after 12 to 18 months of trying to become pregnant. Infertility is negatively correlated with age. The older the parents, the more likely infertility will occur (see Figure 2-14).

Figure 2-14 Older Women and Risks of Pregnancy

Not only does the rate of infertility increase as women get older, but the risk of chromosomal abnormality increases as well.

(Source: Reproductive Medicine Associates of New Jersey, 2002.)



In men, infertility is typically a result of producing too few sperm. Use of illicit drugs or cigarettes and previous bouts of sexually transmitted diseases also increase infertility. For women, the most common cause of infertility is failure to release an egg through ovulation. This may occur because of a hormone imbalance, a damaged fallopian tube or uterus, stress, or abuse of alcohol or drugs (Lewis, Legato, & Fisch, 2006; Kelly-Weeder & Cox, 2007; Wilkes et al., 2009).

Several treatments for infertility exist. Some difficulties can be corrected through the use of drugs or surgery. Another option may be **artificial insemination**, a procedure in which a man's sperm is placed directly into a woman's vagina by a physician. In some situations, the woman's husband provides the sperm, while in others it is an anonymous donor from a sperm bank.

artificial insemination
a process of fertilization in which a man's sperm is placed directly into a woman's vagina by a physician.

In other cases, fertilization takes place outside of the mother's body. **In vitro fertilization (IVF)** is a procedure in which a woman's ova are removed from her ovaries, and a man's sperm are used to fertilize the ova in a laboratory. The fertilized egg is then implanted in a woman's uterus. Similarly, *gamete intrafallopian transfer* (*GIFT*) and *zygote intrafallopian transfer* (*ZIFT*) are procedures in which an egg and sperm or fertilized egg are implanted in a woman's fallopian tubes. In IVF, GIFT, and ZIFT, implantation is done either in the woman who provided the donor eggs or, in rarer instances, in a *surrogate mother*, a woman who agrees to carry the child to term. Surrogate mothers may also be used in cases in which the mother is unable to conceive; the surrogate mother is artificially inseminated by the biological father, and she agrees to give up rights to the infant (Frazier et al., 2004; Kolata, 2004; Hertz & Nelson, 2015).

in vitro fertilization (IVF)
a procedure in which a woman's ova are removed from her ovaries and a man's sperm are used to fertilize the ova in a laboratory.

In vitro fertilization is increasingly successful, with pregnancy rates as high as 48 percent for women under 35 (but with lower rates for older women). (Actual live birth rates are lower, since not all pregnancies ultimately result in birth.) It is also becoming more commonplace, with the procedure being used and publicized by women such as actresses Mariah Carey and Nicole Kidman. Worldwide, more than 3 million babies have been created through in vitro fertilization (SART, 2012).

Furthermore, reproductive technologies are increasingly sophisticated, permitting parents to choose the sex of their baby. One technique is to separate sperm carrying the X and Y chromosomes and later implant the desired type into a woman's uterus. In another technique, eggs are removed from a woman and fertilized with sperm using in vitro fertilization. Three days after fertilization, the embryos are tested to determine their sex. If they are the desired gender, they are then implanted into the mother (Duenwald, 2003, 2004; Kalb, 2004).

ETHICAL ISSUES. The use of surrogate mothers, in vitro fertilization, and sex selection techniques presents a web of ethical and legal issues, as well as many emotional concerns. In some cases, surrogate mothers have refused to give up the child after its birth, whereas in others the surrogate mother has sought to have a role in the child's life. In such cases, the rights of the mother, the father, the surrogate mother, and ultimately the baby are in conflict.

Even more troubling are concerns raised by sex selection techniques. Is it ethical to terminate the life of an embryo based on its sex? Do cultural pressures that may favor boys over girls make it permissible to seek medical intervention to produce male offspring? And—even more disturbing—if it is permissible to intervene in the reproductive process to obtain a favored sex, what about other characteristics determined by genetics that it may be possible in the future to preselect for? For instance, assuming the technology advances, would it be ethical to select for a favored eye or hair color, a certain level of intelligence, or a particular kind of personality? That's not feasible now, but it is not outside the realm of possibility in the future (Bonnicksen, 2007; Mameli, 2007; Roberts, 2007).

For the moment, many of these ethical issues remain unresolved. But we can answer one question: how do children conceived using emerging reproductive technologies such as in vitro fertilization fare?

Research shows that they do quite well. In fact, some studies find that the quality of family life for those who have used such techniques may be superior to that in families with naturally conceived children. Furthermore, the later psychological adjustment of children conceived using in vitro fertilization and artificial insemination is no different from that of children conceived using natural techniques (DiPietro, Costigan, & Gurewitsch, 2005; Hjelmstedt, Widström, & Collins, 2006; Siegel, Dittrich, & Vollmann, 2008).

On the other hand, the increasing use of IVF techniques by older individuals (who might be quite elderly when their children reach adolescence) may change these positive findings. Because widespread use of IVF is only recent, we just don't know yet what will happen with aging parents (Colpin & Soenen, 2004).

MISCARRIAGE AND ABORTION. A *miscarriage*—known as a spontaneous abortion—occurs when pregnancy ends before the developing child is able to survive outside the mother's womb. The embryo detaches from the wall of the uterus and is expelled.

Some 15 percent to 20 percent of all pregnancies end in miscarriage, usually in the first several months of pregnancy. (The term *stillbirth* is used to describe the death of a developing child 20 weeks or more after conception.) Many miscarriages occur so early that the mother is not even aware she was pregnant and may not even know she has suffered a miscarriage. However, as women are able to learn they are pregnant earlier than ever before due to the advent of home pregnancy tests, the number of women who know they have suffered a miscarriage has increased.

Typically, miscarriages are attributable to some sort of genetic abnormality. In addition, hormonal problems, infections, or maternal health problems can lead to miscarriage. Whatever the cause, women who suffer miscarriage frequently experience anxiety, depression, and grief. Even after subsequently having a healthy child, women who have had a miscarriage in the past still have a higher risk for depression and may have difficulty caring for their healthy child (Leis-Newman, 2012; Murphy, Lipp, & Powles, 2012).

Each year, over 40 million pregnancies worldwide end in *abortion*, in which a mother voluntarily chooses to terminate pregnancy. Involving a complex set of physical, psychological, legal, and ethical issues, abortion is a difficult choice for every woman. A task force of the American Psychological Association (APA), which looked at the aftereffects of abortion, found that following an abortion most women experienced a combination of relief over terminating an unwanted pregnancy as well as regret and guilt. In most cases, for adult women with an unplanned pregnancy who had an elective, first-semester abortion, the risk of mental health problems was not higher than for women who actually deliver that pregnancy (APA Reproductive Choice Working Group, 2000; Sedgh et al., 2012). On the other hand, other research finds that abortion may be associated with an increased risk of future psychological problems. Clearly, there are significant individual differences in how women respond to the experience of abortion, and in all cases, abortion is a complicated and difficult decision (Fergusson, Horwood, & Ridder, 2006; Cockrill & Gould, 2012; van Ditzhuijzen et al., 2013).

The Prenatal Environment: Threats to Development

LO 2.16 Describe the threats to the fetal environment and what can be done about them.

According to the Siriono people of South America, if a pregnant woman eats the meat of certain kinds of animals, she runs the risk of having a child who may act and look like those animals. According to opinions offered on daytime talk shows, a pregnant mother should avoid getting angry in order to spare her child from entering the world with anger (Cole, 1992).

Such views are largely the stuff of folklore, although there is some evidence that a mother's anxiety during pregnancy may affect the sleeping patterns of the fetus prior to birth. There are certain aspects of a mother's and father's behavior, both before and after conception, that can produce lifelong consequences for the child. Some consequences show up immediately, but half the possible problems aren't apparent before birth. Other problems, more insidious, may not appear until years after birth (Couzin, 2002; Tiesler & Heinrich, 2014).

Some of the most profound consequences are brought about by teratogenic agents. A **teratogen** is an environmental agent such as a drug, chemical, virus, or other factor that produces a birth defect. Although it is the job of the placenta to keep teratogens from reaching the fetus, the placenta is not entirely successful at this, and probably every fetus is exposed to some teratogens.

teratogen
an environmental agent that produces a birth defect.

The timing and quantity of exposure to a teratogen are crucial. At some phases of prenatal development, a certain teratogen may have only a minimal impact. At other periods, however, the same teratogen may have profound consequences. Generally, teratogens have their largest effects during periods of especially rapid prenatal development. Sensitivity to specific teratogens is also related to racial and cultural background. For example, Native American fetuses are more susceptible to the effects of alcohol than those of European American descent (Kinney et al., 2003; Winger & Woods, 2004; Rentner, Dixon, & Lengel, 2012).

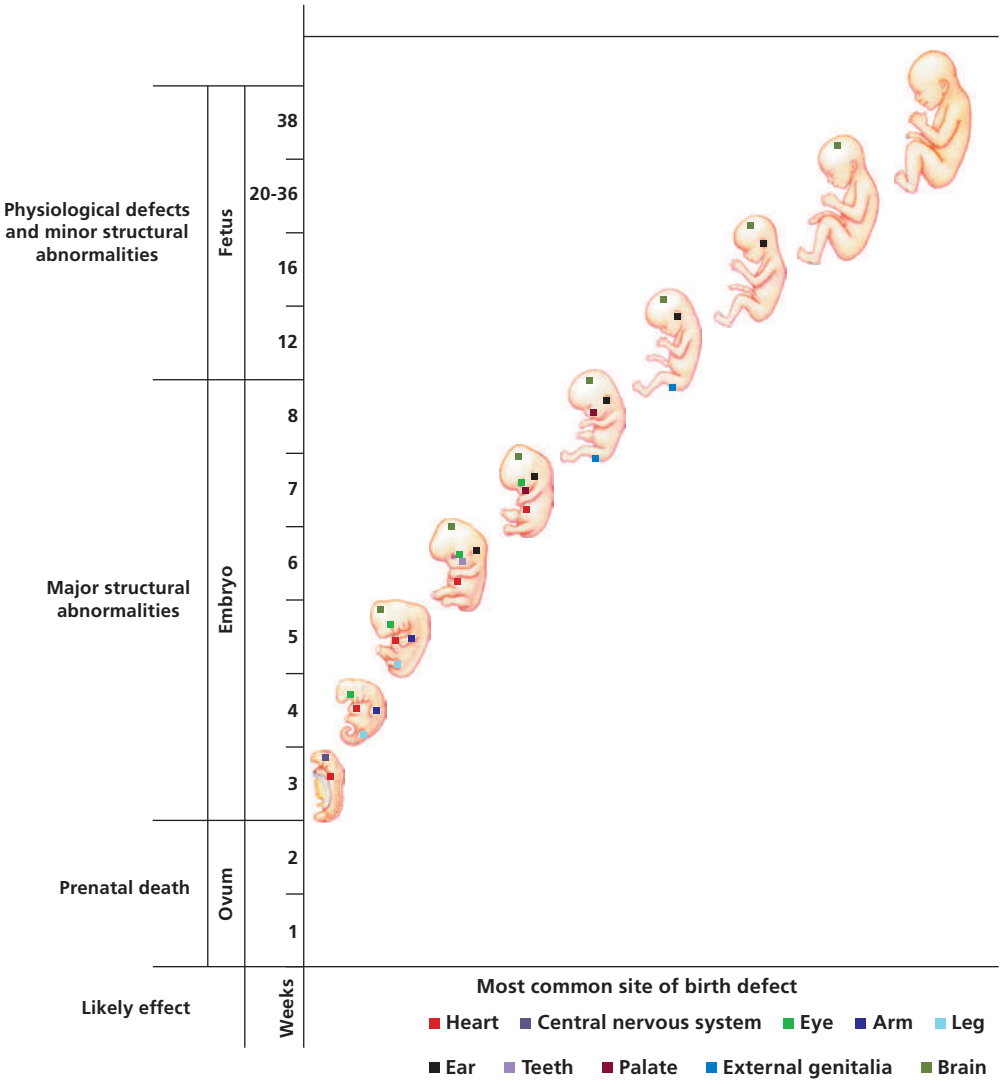
Furthermore, different organ systems are vulnerable to teratogens at different times during development. For example, the brain is most susceptible 15 to 25 days after conception, while the heart is most vulnerable 20 to 40 days following conception (see Figure 2-15; Bookstein et al., 1996; Pajkrt et al., 2004).

When considering the findings relating to specific teratogens, as we'll do next, we need to keep in mind the broader social and cultural context in which teratogen exposure occurs. For example, living in poverty increases the chances of exposure to teratogens. Mothers who are poor may not be able to afford adequate diets, and they may not be able to afford adequate medical care, making them more susceptible to illnesses that can damage a developing fetus. They are also more likely to be exposed to pollution. Consequently, it is important to consider the social factors that permit exposure to teratogens.

Figure 2-15 Teratogen Sensitivity

Depending on their state of development, some parts of the body vary in their sensitivity to teratogens.

(Source: Moore, 1974.)



MOTHER'S DIET. Most of our knowledge of the environmental factors that affect the developing fetus comes from study of the mother. For instance, as the midwife pointed out in the example of Lisa and Robert, a mother's diet clearly plays an important role in bolstering the development of the fetus. A mother who eats a varied diet high in nutrients is apt to have fewer complications during pregnancy, an easier labor, and a generally healthier baby than a mother whose diet is restricted in nutrients (Guerrini, Thomson, & Gurling, 2007; Marques, 2014).

With 800 million hungry people in the world, the problem of diet is of immense global concern. Even worse, the number of people vulnerable to hunger is close to one *billion*. Clearly, restrictions in diet that bring about hunger on such a massive scale affect millions of children born to women living in those conditions (United Nations, 2015).

Fortunately, there are ways to counteract the types of maternal malnourishment that affect prenatal development. Dietary supplements given to mothers can reverse some of the problems produced by a poor diet. Furthermore, research shows that babies who were malnourished as fetuses, but who are subsequently raised in enriched environments, can overcome some of the effects of their early malnourishment. However, the reality is that

few of the world's children whose mothers were malnourished *before* their birth are apt to find themselves in enriched environments after birth (Kramer, 2003; Olness, 2003).

MOTHER'S AGE. More women are giving birth later in life than was true just two or three decades ago. The cause for this change is largely due to transformations in society, as more women choose to continue their education with advanced degrees and to start careers prior to giving birth to their first child (Gibbs, 2002; Wildberger, 2003; Bornstein et al., 2006).

Consequently, the number of women who give birth in their 30s and 40s has grown considerably since the 1970s. However, this delay in childbirth has potential consequences for both mothers' and children's health. Women who give birth when over the age of 30 are at greater risk for a variety of pregnancy and birth complications than younger ones. For instance, they are more apt to give birth prematurely, and their children are more likely to have low birthweights. This occurs in part because of a decline in the condition of a woman's eggs. For example, by the time they are 42 years old, 90 percent of a woman's eggs are no longer normal (Cnattingius, Berendes, & Forman, 1993; Gibbs, 2002).

Older mothers are also considerably more likely to give birth to children with Down syndrome, a form of mental retardation. About one out of 100 babies born to mothers over 40 has Down syndrome; for mothers over 50, the incidence increases to 25 percent, or one in four (Gaulden, 1992). On the other hand, some research shows that older mothers are not automatically at risk for more pregnancy problems. For instance, one study found that when women in their 40s who had not experienced health difficulties were considered, they were no more likely to have prenatal problems than those in their 20s (Ales, Druzin, & Santini, 1990; Dildy et al., 1996).

The risks involved in pregnancy are greater not only for older mothers but for atypically young women as well. Women who become pregnant during adolescence—and such pregnancies actually encompass 20 percent of all pregnancies—are more likely to have premature deliveries. Furthermore, the mortality rate of infants born to adolescent mothers is double that for mothers in their 20s (Kirchengast & Hartmann, 2003).

MOTHER'S PRENATAL SUPPORT. Keep in mind, though, that the higher mortality rate for babies of adolescent mothers reflects more than just physiological problems related to the mothers' young age. Young mothers often face adverse social and economic factors that can affect infant health. Many teenage mothers do not have enough money or social support, a situation that prevents them from getting good prenatal care and parenting support after the baby is born. Poverty or social circumstances, such as a lack of parental involvement or supervision, may even have set the stage for the adolescent to become pregnant in the first place (Huizink, Mulder, & Buitelaar, 2004; Langille, 2007; Meade, Kershaw, & Ickovics, 2008).

MOTHER'S HEALTH. Mothers who eat the right foods, maintain an appropriate weight, and exercise appropriately maximize the chances of having a healthy baby. Furthermore, they can reduce the lifetime risk of obesity, high blood pressure, and heart disease in their children by maintaining a healthy lifestyle (Walker & Humphries, 2005, 2007).

In contrast, illness in a pregnant woman can have devastating consequences. For instance, the onset of *rubella* (German measles) in the mother prior to the eleventh week of pregnancy is likely to cause serious consequences in the baby, including blindness, deafness, heart defects, or brain damage. In later stages of a pregnancy, however, adverse consequences of rubella become increasingly less likely.

Several other diseases may affect a developing fetus, again depending on when the illness is contracted. For instance, *chicken pox* may produce birth defects, while *mumps* may increase the risk of miscarriage.

Some sexually transmitted diseases, such as *syphilis*, can be transmitted directly to the fetus, who will be born suffering from the disease. In some cases, sexually transmitted diseases such as *gonorrhea* are communicated to the child as it passes through the birth canal to be born.

AIDS (*acquired immune deficiency syndrome*) is the newest of the diseases to affect a newborn. Mothers who have the disease or who merely are carriers of the virus may pass it on to their fetuses through the blood that reaches the placenta. However, if mothers with AIDS are treated with antiviral drugs such as AZT during pregnancy, less than 5 percent of infants are born with the disease. Those infants who are born with AIDS must remain on antiviral drugs their entire lives (Nesheim et al., 2004).

MOTHER'S DRUG USE. A mother's use of many kinds of drugs—both legal and illegal—poses serious risks to the unborn child. Even over-the-counter remedies for common ailments can have surprisingly injurious consequences. For instance, aspirin taken for a headache can lead to fetal bleeding and growth impairments (Tsantefski, Humphreys, & Jackson, 2014).

Even drugs prescribed by medical professionals have sometimes had disastrous consequences. In the 1950s, many women who were told to take *thalidomide* for morning sickness during their pregnancies gave birth to children with stumps instead of arms and legs. Although the physicians who prescribed the drug did not know it, thalidomide inhibited the growth of limbs that normally would have occurred during the first three months of pregnancy.

Some drugs taken by mothers cause difficulties in their children literally decades after they were taken. As recently as the 1970s, the artificial hormone *DES* (*diethylstilbestrol*) was frequently prescribed to prevent miscarriage. Only later was it found that the daughters of mothers who took DES stood a much higher-than-normal chance of developing a rare form of vaginal or cervical cancer and had more difficulties during their pregnancies. Sons of the mothers who had taken DES had their own problems, including a higher-than-average rate of reproductive difficulties (Schecter, Finkelstein, & Koren, 2005).

Birth control or fertility pills taken by pregnant women before they are aware of their pregnancy can also cause fetal damage. Such medicines contain sex hormones that affect developing brain structures in the fetus and can cause significant damage (Miller, 1998; Brown, Hines, & Fane, 2002).

Illicit drugs may pose equally great, and sometimes even greater, risks for the environments of prenatal children. For one thing, the purity of drugs purchased illegally varies significantly, so drug users can never be quite sure what specifically they are ingesting. Furthermore, the effects of some commonly used illicit drugs can be particularly devastating (Jones, 2006; Mayes et al., 2007).

Consider, for instance, the use of *marijuana*. Certainly one of the most commonly used illegal drugs—millions of people in the United States have admitted trying it—marijuana used during pregnancy can restrict the oxygen that reaches the fetus. Its use can lead to infants who are irritable, nervous, and easily disturbed. Children exposed to marijuana prenatally show learning and memory deficits at the age of 10 (Williams & Ross, 2007; Goldschmidt et al., 2008; Willford, Richardson, & Day, 2012).

During the early 1990s, *cocaine* use by pregnant women led to an epidemic of thousands of so-called crack babies. Cocaine produces an intense restriction of the arteries leading to the fetus, causing a significant reduction in the flow of blood and oxygen, increasing the risks of fetal death and a number of birth defects and disabilities (Schuetze, Eiden, & Coles, 2007).

Children whose mothers were addicted to cocaine may themselves be born addicted to the drug and may have to suffer through the pain of withdrawal. Even if not addicted, they may be born with significant problems. They are often shorter and weigh less than average, and they may have serious respiratory problems, visible birth defects, or seizures. They behave quite differently from other infants: their reactions to stimulation are muted, but once they start to cry, it may be hard to soothe them (Singer et al., 2000; Eiden, Foote, & Schuetze, 2007; Richardson, Goldschmidt, & Willford, 2009).

It is difficult to determine the long-term effects of mothers' cocaine use in isolation, because such drug use is often accompanied by poor prenatal care and impaired nurturing following birth. In many cases, it is the poor caregiving by mothers who use cocaine

that results in children's problems, and not exposure to the drug. Treatment of children exposed to cocaine consequently requires not only that the child's mother stop using the drug but an improvement in the level of care the mother or other caregivers provide to the infant (Brown et al., 2004; Jones, H. E., 2006; Schempf, 2007).

MOTHER'S USE OF ALCOHOL AND TOBACCO. A pregnant woman who reasons that having a drink every once in a while or smoking an occasional cigarette has no appreciable effect on her unborn child is kidding herself: increasing evidence suggests that even small amounts of alcohol and nicotine can disrupt the development of the fetus.

Mothers' use of alcohol can have profound consequences for the unborn child. The children of alcoholics, who consume substantial quantities of alcohol during pregnancy, are at the greatest risk. Approximately 1 out of every 750 infants is born with **fetal alcohol spectrum disorder (FASD)**, a disorder that may include below-average intelligence and sometimes mental retardation, delayed growth, and facial deformities. FASD is now the primary preventable cause of mental retardation (Burd et al., 2003; Calhoun & Warren, 2007; Bakoyiannis et al., 2014).

fetal alcohol spectrum disorder (FASD)
a disorder caused by the pregnant mother consuming substantial quantities of alcohol during pregnancy, potentially resulting in mental retardation and delayed growth in the child.

Even mothers who use smaller amounts of alcohol during pregnancy place their children at risk. **Fetal alcohol effects (FAE)** is a condition in which children display some, although not all, of the problems of FASD due to their mother's consumption of alcohol during pregnancy (Baer, Sampson, & Barr, 2003; Molina et al., 2007).

fetal alcohol effects (FAE)
a condition in which children display some, though not all, of the problems of fetal alcohol syndrome due to the mother's consumption of alcohol during pregnancy.

Children who do not have FAE may still be affected by their mothers' use of alcohol. Studies have found that maternal consumption of an average of just two alcoholic drinks a day during pregnancy is associated with lower intelligence in their offspring at age seven. Other research concurs, suggesting that relatively small quantities of alcohol taken during pregnancy can have future adverse effects on children's behavior and psychological functioning. Furthermore, the consequences of alcohol ingestion during pregnancy are long lasting. For example, one study found that 14-year-olds' success on a test involving spatial and visual reasoning was related to their mothers' alcohol consumption during pregnancy. The more the mothers reported drinking, the less accurately their children responded (Mattson, Calarco, & Lang, 2006; Streissguth, 2007; Chiodo et al., 2012).

Because of the risks associated with alcohol, physicians today counsel pregnant women (and even those who are trying to become pregnant) to avoid drinking any alcoholic beverages. In addition, they caution against another practice proven to have an adverse effect on an unborn child—smoking.

Smoking produces several consequences, none good. For starters, smoking reduces the oxygen content and increases the carbon monoxide of the mother's blood, which quickly reduces the oxygen available to the fetus. In addition, the nicotine and other toxins in cigarettes slow the respiration rate of the fetus and speed up its heart.

The ultimate result is an increased possibility of miscarriage and a higher likelihood of death during infancy. In fact, estimates suggest that smoking by pregnant women leads to more than 100,000 miscarriages and the deaths of 5,600 babies in the United States alone each year (Haslam & Lawrence, 2004; Triche & Hossain, 2007).

Smokers are two times as likely as nonsmokers to have babies with an abnormally low birthweight, and smokers' babies are shorter, on average, than those of nonsmokers. Furthermore, women who smoke during pregnancy are 50 percent more likely to have mentally retarded children. Finally, mothers who smoke are more likely to have children who exhibit disruptive behavior during childhood (McCowan et al., 2009; Alshaarawy & Anthony, 2014).

The consequences of smoking are so profound that it may affect not only a mother's children but her grandchildren. For example,

Pregnant women who drink alcohol place their unborn children at risk.

children whose *grandmothers* smoked during pregnancy are more than twice as likely to develop childhood asthma than children of grandmothers who did not smoke (Li et al., 2005).

DO FATHERS AFFECT THE PRENATAL ENVIRONMENT? It would be easy to reason that once the father has done his part in the sequence of events leading to conception, he would have no role in the *prenatal* environment of the fetus. Developmental researchers have in the past generally shared this view, and there is relatively little research investigating fathers' influence on the prenatal environment.

It is becoming increasingly clear, however, that fathers' behavior may well influence the prenatal environment. Consequently, health practitioners are applying the research to suggest ways fathers can support healthy prenatal development (Martin et al., 2007).

For instance, fathers-to-be should avoid smoking. Secondhand smoke from a father's cigarettes may affect the mother's health, which in turn influences her unborn child. The greater the level of a father's smoking, the lower the birthweight of his children (Hyssaelae, Rautava, & Helenius, 1995; Tomblin, Hammer, & Zhang, 1998).

From a *health-care provider's* perspective

In addition to avoiding smoking, what else might fathers-to-be do to help their unborn children develop normally in the womb?

Similarly, a father's use of alcohol and illegal drugs can have significant effects on the fetus. Alcohol and drug use impairs sperm and may lead to chromosomal damage that may affect the fetus at conception. In addition, alcohol and drug use during pregnancy may also affect the prenatal environment by creating stress in the mother and generally producing an unhealthy environment. A father's exposure to environmental toxins in the workplace, such as lead or mercury, may cause the toxins to bind themselves to sperm and cause birth defects (Wakefield et al., 1998; Dare et al., 2002; Choy et al., 2002).

Finally, fathers who are physically or emotionally abusive to their pregnant wives can damage their unborn children. By increasing the level of maternal stress, or actually causing physical damage, abusive fathers increase the risk of harm to their unborn children. In fact, 4 to 8 percent of women face physical abuse during pregnancy (Gazmarian et al., 2000; Bacchus, Mezey, & Bewley, 2006; Martin et al., 2006).

Are You an Informed Consumer of Development?

Optimizing the Prenatal Environment

If you are contemplating ever having a child, you may be overwhelmed, at this point in the chapter, by the number of things that can go wrong. Don't be. Although both genetics and the environment pose their share of risks, in the vast majority of cases, pregnancy and birth proceed without mishap. Moreover, women can do several things—both before and during pregnancy—to optimize the probability that pregnancy will progress smoothly (Massaro, Rothbaum, & Aly, 2006). Among them are the following:

- **For women who are planning to become pregnant, several precautions are in order.** First, women should have nonemergency X-rays only during the first two weeks after their menstrual periods. Second, women should be vaccinated against rubella (German measles) at least three, and preferably six, months before getting pregnant. Finally, women who are planning to become pregnant should avoid the use of birth control pills at least three months before trying to conceive, because of disruptions to hormonal production caused by the pills.
- **Eat well, both before and during (and after, for that matter!) pregnancy.** Pregnant mothers are, as the old saying goes, eating for two. This means that it is more essential than ever to eat regular, well-balanced meals. In addition, physicians typically recommend taking prenatal

vitamins that include folic acids, which can decrease the likelihood of birth defects (Amitai et al., 2004).

- **Don't use alcohol and other drugs.** The evidence is clear that many drugs pass directly to the fetus and may cause birth defects. It is also clear that the more one drinks, the greater the risk to the fetus. Here is the best advice, whether you are already pregnant or planning to have a child
- **Don't use *any* drug unless directed by a physician.** If you are planning to get pregnant, encourage your partner to avoid using alcohol or other drugs too (O'Connor & Whaley, 2006).
- **Monitor caffeine intake.** Although it is still unclear whether caffeine produces birth defects, it is known that the caffeine found in coffee, tea, and chocolate can pass to the fetus, acting as a stimulant. Because of this, you probably shouldn't drink more than a few cups of coffee a day (Wisborg et al., 2003; Diego et al., 2007).
- **Whether pregnant or not, don't smoke.** This holds true for mothers, fathers, and anyone else in the vicinity of the pregnant mother, since research suggests that smoke in the fetal environment can affect birthweight.
- **Exercise regularly.** In most cases, women can continue to exercise, particularly exercise involving low-impact routines. On the other hand, extreme exercise should be avoided, especially on very hot or very cold days. "No pain, no gain" isn't applicable during pregnancy (Paisley, Joy, & Price, 2003; Schmidt et al., 2006; DiNallo, Downs, & Le Masurier, 2012).

Module 2.3 Review

- When sperm enter the vagina, they begin a journey that takes them through the cervix, the opening into the uterus, and into the fallopian tube, where fertilization may take place. Fertilization joins the sperm and ovum to start prenatal development.
- The prenatal period consists of three stages: germinal, embryonic, and fetal.
- Some couples need medical aid to help them conceive. Among the alternate routes to conception are artificial insemination and in vitro fertilization (IVF). Some women may also experience miscarriage or opt for an abortion.
- A teratogen is an environmental agent such as a drug, chemical, virus, or other factor that produces a birth defect. The diet, age, prenatal support, and illnesses of mothers can affect their babies' health and growth. Mothers' use of drugs, alcohol, tobacco, and caffeine can adversely affect the health and development of the unborn child. Fathers' and others' behaviors (e.g., smoking) can also affect the health of the unborn child.

Journal Writing Prompt

Applying Lifespan Development: Studies show that the mother's age has potential consequences for the child's health. How might genetics and environmental influences (such as the mother's prenatal support) combine to produce these results?

Epilogue

In this chapter, we have discussed the basics of heredity and genetics, including the way in which the code of life is transmitted across generations through DNA. We have also seen how genetic transmission can go wrong, and we have discussed ways in which genetic disorders can be treated—and perhaps prevented—through new interventions such as genetic counseling.

One important theme in this chapter has been the interaction between hereditary and environmental factors in determining a number of human traits. While we have encountered a number of surprising instances in which heredity plays a part—including in the development of personality traits and even personal preferences and tastes—we have also seen that heredity is virtually never the sole factor in any complex trait. Environment nearly always plays an important role.

Finally, we reviewed the main stages of prenatal growth—germinal, embryonic, and fetal—and examined threats to the prenatal environment and ways to optimize that environment for the fetus.

Before moving on, return to the prologue of this chapter and the case of the Chens' son, who was treated for spina bifida before he even was born. Answer the following questions based on your understanding of genetics and prenatal development.

1. Do you believe that the Chens made the correct decision in permitting their son to be operated on *in utero* rather than waiting until after his birth? Why?

2. Research suggests that insufficient folic acid in the mother's diet contributes to incidents of spina bifida in offspring. Do you see this as a genetic or an environmental factor? Explain your thinking.
3. What kind of evidence would suggest whether spina bifida is an X-linked recessive disorder?
4. If it had not been possible to perform fetal surgery on the Chens' son, what do you think the best course of action would have been for his parents?

Looking Back

LO 2.1 Describe how genes and chromosomes provide our basic genetic endowment.

A child receives 23 chromosomes from each parent. These 46 chromosomes provide the genetic blueprint that will guide cell activity for the rest of the individual's life.

LO 2.2 Compare monozygotic twins with dizygotic twins.

Monozygotic twins are twins who are genetically identical. Dizygotic twins are two separate ova fertilized by two separate sperm at roughly the same time.

LO 2.3 Describe how the sex of a child is determined.

When an ovum and sperm meet at the moment of fertilization, the ovum provides an X chromosome, while the sperm provides either an X or a Y chromosome. If the sperm contributes its X chromosome, the child will have an XX pairing and will be a girl. If the sperm contributes a Y chromosome, the result will be an XY pairing—a boy.

LO 2.4 Explain the mechanisms by which genes transmit information.

A genotype is the underlying combination of genetic material present in an organism, but invisible; a phenotype is the visible trait, the expression of the genotype.

LO 2.5 Describe the field of behavioral genetics and what it encompasses.

The field of behavioral genetics, a combination of psychology and genetics, studies the effects of genetics on behavior and psychological characteristics.

LO 2.6 Explain what can happen when development deviates from the norm.

Genes may become physically damaged or may spontaneously mutate. If damaged genes are passed on to the child, the result can be a genetic disorder.

LO 2.7 Describe the role of genetic counselors, and differentiate between different forms of prenatal testing.

Genetic counselors use a variety of data and techniques to advise future parents of possible genetic risks to their unborn children. A variety of techniques can be used to assess the health of an unborn child if a woman is already pregnant, including ultrasound, CVS, and amniocentesis.

LO 2.8 Explain how the environment and genetics work together to determine human characteristics.

Behavioral characteristics are often determined by a combination of genetics and environment. Genetically based traits represent a potential, called the genotype, which may be affected by the environment and is ultimately expressed in the phenotype.

LO 2.9 Summarize how researchers study the interaction of genetic and environmental factors in development.

To work out the different influences of heredity and environment, researchers use nonhuman studies and human studies, particularly of twins.

LO 2.10 Explain how genetics and the environment jointly influence physical traits, intelligence, and personality.

Virtually all human traits, characteristics, and behaviors are the result of the combination and interaction of nature and nurture. Many physical characteristics show strong genetic influences. Intelligence contains a strong genetic component but can be significantly influenced by environmental factors. Some personality traits, including neuroticism and extroversion, have been linked to genetic factors, and even attitudes, values, and interests have a genetic component. Some personal behaviors may be genetically influenced through the mediation of inherited personality traits.

LO 2.11 Explain the role genetics and the environment play in the development of psychological disorders.

Certain psychological disorders, such as schizophrenia, are largely caused by genetics. Other disorders, including alcoholism and major depressive disorder, have both genetic and environmental causes.

LO 2.12 Describe ways in which genes influence the environment.

Children may influence their environment through genetic traits that cause them to construct—or influence their

parents to construct—an environment that matches their inherited dispositions and preferences.

LO 2.13 Explain the process of fertilization.

When sperm enter the vagina, they begin a journey that takes them through the cervix, the opening into the uterus, and into the fallopian tube, where fertilization may take place. Fertilization joins the sperm and ovum to start prenatal development.

LO 2.14 Summarize the three stages of prenatal development.

The germinal stage (fertilization to two weeks) is marked by rapid cell division and specialization, and the attachment of the zygote to the wall of the uterus. During the embryonic stage (two to eight weeks), the ectoderm, the mesoderm, and the endoderm begin to grow and specialize. The fetal stage (eight weeks to birth) is characterized by a rapid increase in complexity and differentiation of the organs. The fetus becomes active, and most of its systems become operational.

LO 2.15 Describe some of the physical and ethical challenges that relate to pregnancy.

Some couples need medical aid to help them conceive. Among the alternate routes to conception are artificial insemination and in vitro fertilization (IVF). Some women may also experience miscarriage or opt for an abortion.

LO 2.16 Describe the threats to the fetal environment and what can be done about them.

A teratogen is an environmental agent such as a drug, chemical, virus, or other factor that produces a birth defect. Factors in the mother that may affect the unborn child include diet, age, illnesses, and drug, alcohol, and tobacco use. The behaviors of fathers and others in the wenvironment may also affect the health and development of the unborn child.

Key Terms and Concepts

zygote 66
genes 66
DNA (deoxyribonucleic acid molecules) 66
chromosomes 66
monozygotic twins 67
dizygotic twins 67
dominant trait 69
recessive trait 69
genotype 69
phenotype 69
homozygous 69
heterozygous 69
polygenic inheritance 70
X-linked genes 71
behavioral genetics 72
Down syndrome 73
fragile X syndrome 73
sickle-cell anemia 73
Tay-Sachs disease 74
Klinefelter's syndrome 74
genetic counseling 74
ultrasound sonography 75
chorionic villus sampling (CVS) 75
amniocentesis 76
temperament 79
multifactorial transmission 79
fertilization 89
germinal stage 90
placenta 90
embryonic stage 90
fetal stage 91
fetus 91
infertility 92
artificial insemination 93
in vitro fertilization (IVF) 93
teratogen 95
fetal alcohol spectrum disorder (FASD) 99
fetal alcohol effects (FAE) 99

Chapter 3

Birth and the Newborn Infant

Learning Objectives

LO 3.1 Describe the normal process of labor.

LO 3.2 Explain the events that occur in the first few hours of a newborn's life.

LO 3.3 Describe some of the current approaches to childbirth.

LO 3.4 Describe some of the causes of, effects of, and treatments for preterm births.

LO 3.5 Identify the risks that postmature babies face.

LO 3.6 Describe the process of cesarean delivery and the reasons for its increase in use.

LO 3.7 Describe rates of infant mortality and what factors affect these statistics.

LO 3.8 Describe the causes and effects of postpartum depression.

LO 3.9 Describe the physical capabilities of the newborn.

LO 3.10 Describe the sensory capabilities of the newborn.

LO 3.11 Describe the learning capabilities of the newborn.

LO 3.12 Describe the social competencies of newborns.

Chapter Overview

Prologue: Expecting the Unexpected

Ariana Campo was all set for the birth of her daughter. Everything on her list was ticked off. Healthy diet. Low-impact pregnancy exercises. Childbirth class.

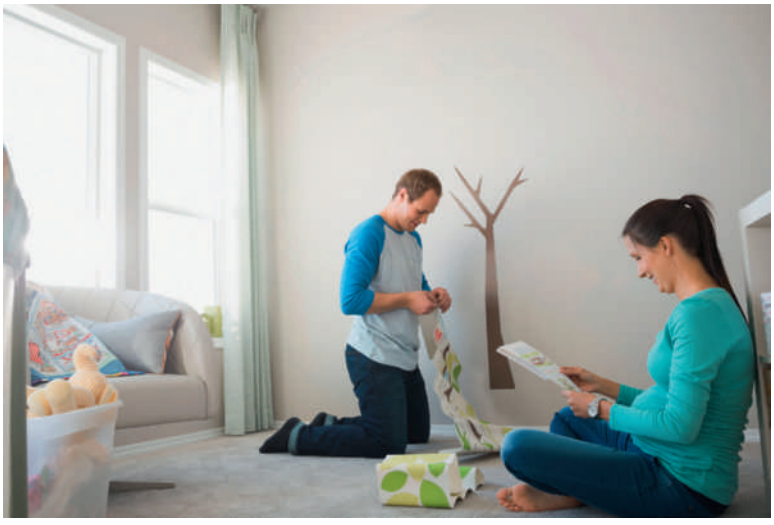
But Ariana's labor didn't go quite the way she'd planned. Her water broke before her contractions started. In fact, her contractions didn't start for another 12 hours, and they never became regular. When her cervix was dilated only 2 centimeters, she felt tremendous pressure to push. The nurse told her not to, but she didn't tell her how, and Ariana found the breathing exercises she'd practiced for months to be completely useless.

After 24 hours of labor, she was given an epidural procedure to relax her, but the drug and the exhaustion made it difficult to push effectively. When the baby's heartbeat began dropping, the doctor used forceps. Ariana's daughter was born within minutes, healthy and beautiful, but then a slight elevation in her temperature kept the baby in the neonatal unit for another week.

Today, her daughter is a lively, curious toddler. "All's well that ends well," Ariana says, "but I learned that when it comes to childbirth, maybe it's best to expect the unexpected." ■

Looking Ahead

While labor and childbirth are generally less difficult than they were for Ariana Campo, all births are tinged with a combination of excitement and some degree of anxiety. In the vast majority of cases, however, delivery goes smoothly, and it is an amazing and joyous moment when a new being enters the world. The excitement of birth is soon replaced by wonder at the extraordinary nature of newborns themselves. Babies enter the world with a surprising array of capabilities, ready from the first moments of life outside the womb to respond to the world and the people in it.



In this chapter, we'll examine the events that lead to the delivery and birth of a child and take an initial look at the newborn. We first consider labor and delivery, exploring how the process usually proceeds as well as several alternative approaches.

We next examine some of the possible complications of birth. The problems that can occur range from premature births to infant mortality. Finally, we consider the extraordinary range of capabilities of newborns. We'll look not only at their physical and perceptual abilities, but at the way they enter the world with the ability to learn and with skills that help form the foundations of their future relationships with others.

Birth

I wasn't completely naïve. I mean, I knew that it was only in movies that babies come out of the womb all pink, dry, and beautiful. But still, I was initially taken aback by my son's appearance. Because of his passage through the birth canal, his head was cone-shaped, a bit like a wet, partly deflated football. The nurse must have noticed my reaction because she hastened to assure me that all this would change in a matter of days. She then moved quickly to wipe off the whitish sticky substance all over his body, informing me as she did so that the fuzzy hair on his ears was only temporary. I leaned in and put my finger into my boy's hand. He rewarded me by closing his hand around it. I interrupted the nurse's assurances. "Don't worry," I stammered, tears suddenly filling my eyes. "He's absolutely the most beautiful thing I've ever seen."

For those of us accustomed to thinking of newborns in the images of baby food commercials, this portrait of a typical newborn may be surprising. Yet most babies come out of the womb resembling this one. Make no mistake, however: Despite their temporary blemishes, babies are a welcome sight to their parents from the moment of their birth.

The newborn's outward appearance is caused by a variety of factors in its journey from the mother's uterus, down the birth canal, and out into the world. We can trace its passage, beginning with the release of the chemicals that initiate the process of labor.

Labor: The Process of Birth Begins

LO 3.1 Describe the normal process of labor.

About 266 days after conception, a protein called *corticotropin-releasing hormone* (CRH) triggers (for some still unknown reason) the release of various hormones, and the process that leads to birth begins. One critical hormone is *oxytocin*, which is released by the mother's pituitary gland. When the concentration of oxytocin becomes high enough, the mother's uterus begins periodic contractions (Hertelendy & Zakar, 2004; Terzidou, 2007; Tattersall et al., 2012).

During the prenatal period, the uterus, which is composed of muscle tissue, slowly expands as the fetus grows. Although for most of the pregnancy it is inactive, after the fourth month it occasionally contracts in order to ready itself for the eventual delivery. These contractions, called *Braxton–Hicks contractions*, are sometimes called "false labor," because while they can fool eager and anxious expectant parents, they do not signify that the baby will be born soon.

neonates
the term used for newborns

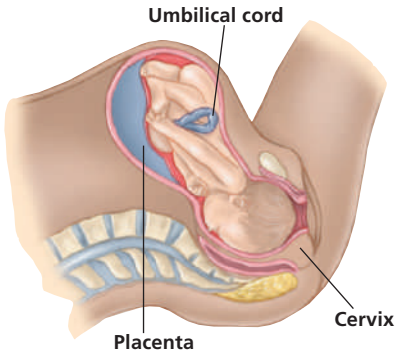
When birth is actually imminent, the uterus begins to contract intermittently. The increasingly intense contractions make the uterus act like a vise, opening and closing to force the head of the fetus against the *cervix*, the neck of the uterus that separates it from the vagina. Eventually, the force of the contractions becomes strong enough to propel the fetus slowly down the birth canal until it enters the world as a **neonate**—the term used for a newborn. It is this exertion and the narrow birth passageway that often gives newborns the battered, cone-head appearance described earlier.

Labor can be exhausting and seems never ending, but support, communication, and a willingness to try different techniques can all be helpful.

Labor proceeds in three stages (see Figure 3-1). In the *first stage of labor*, the uterine contractions initially occur around every 8 to 10 minutes and last about 30 seconds. As labor proceeds, the contractions occur more frequently and last longer. Toward the end of labor, the contractions may occur every 2 minutes and last almost 2 minutes. During the final part of the first stage of labor, the contractions increase to their greatest intensity, a period known as *transition*. The mother's cervix fully opens, eventually

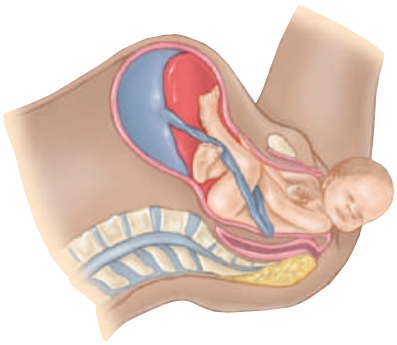
Figure 3-1 The Three Stages of Labor

Stage 1



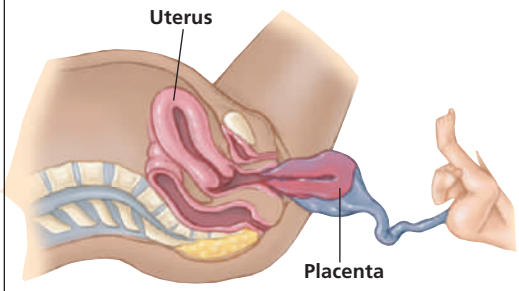
Uterine contractions initially occur every 8 to 10 minutes and last 30 seconds. Toward the end of labor, contractions may occur every 2 minutes and last as long as 2 minutes. As the contractions increase, the cervix, which separates the uterus from the vagina, becomes wider, eventually expanding to allow the baby's head to pass through.

Stage 2



The baby's head starts to move through the cervix and birth canal. Typically lasting around 90 minutes, the second stage ends when the baby has completely left the mother's body.

Stage 3



The child's umbilical cord (still attached to the neonate) and the placenta are expelled from the mother. This stage is the quickest and easiest, taking just a few minutes.

expanding enough (usually to around 10 centimeters) to allow the baby's head (the widest part of the body) to pass through.

This first stage of labor is the longest. Its duration varies significantly, depending on the mother's age, race, ethnicity, number of prior pregnancies, and a variety of other factors involving both the fetus and the mother. Typically, labor takes 16 to 24 hours for firstborn children, but there are wide variations. Births of subsequent children usually involve shorter periods of labor.

During the *second stage of labor*, which typically lasts around 90 minutes, the baby's head emerges further from the mother with each contraction, increasing the size of the vaginal opening. Because the area between the vagina and rectum must stretch a good deal, an incision called an **episiotomy** is sometimes made to increase the size of the opening of the vagina. However, this practice has been increasingly criticized in recent years as potentially causing more harm than good, and the number of episiotomies has fallen drastically in the last decade (Graham et al., 2005; Dudding, Vaizey, & Kamm, 2008; Manzanares et al., 2013). The second stage of labor ends when the baby has completely left the mother's body.

episiotomy
an incision sometimes made to increase the size of the opening of the vagina to allow the baby to pass

Finally, the *third stage of labor* occurs when the child's umbilical cord (still attached to the neonate) and the placenta are expelled from the mother. This stage is the quickest and easiest, taking just a few minutes.

A woman's reactions to labor reflect, in part, cultural factors. Although there is no evidence that the physiological aspects of labor differ among women of different cultures, expectations about labor and interpretations of its pain do vary significantly from one culture to another (Callister et al., 2003; Fisher, Hauck, & Fenwick, 2006; Steel et al., 2014).

For instance, there is a kernel of truth to popular stories of pregnant women in certain societies putting down the tools with which they are tilling their fields, stepping aside and giving birth, and immediately returning to work with their neonates wrapped and bundled on their backs. Accounts of the !Kung people in Africa describe the woman in labor sitting calmly beside a tree and without much ado—or assistance—successfully giving birth to a child and quickly recovering. On the other hand, many societies regard childbirth as dangerous, and some even view it in terms

WATCH THIS VIDEO ON MYPSYCHLAB LABOR

Are You an Informed Consumer of Development?

Dealing with Labor

Every woman who is soon to give birth has some fear of labor. Most have heard gripping tales of extended, 48-hour labors or vivid descriptions of the pain that accompanies labor. Still, few mothers would dispute the notion that the rewards of giving birth are worth the effort.

There is no single right or wrong way to deal with labor. However, several strategies can help make the process as positive as possible:

- **Be flexible.** Although you may have carefully worked out what to do during labor, don't feel an obligation to follow through exactly. If a strategy is ineffective, turn to another one.
- **Communicate with your health-care providers.** Let them know what you are experiencing. They may be able to suggest ways to deal with what you are encountering. As your labor progresses, they may also be able to give you a fairly clear idea of how much longer you will be in labor. Knowing the worst of the pain is going to last only another 20 minutes or so, you may feel you can handle it.
- **Remember that labor is … laborious.** Expect that you may become fatigued, but realize that as the final stages of labor occur, you may well get a second wind.
- **Accept your partner's support.** If a spouse or other partner is present, allow that person to make you comfortable and provide support. Research has shown that women who are supported by a spouse or partner have a more comfortable birth experience (Bader, 1995; Kennell, 2002).
- **Be realistic and honest about your reactions to pain.** Even if you had planned an unmedicated delivery, realize that you may find the pain difficult to tolerate. At that point, consider the use of drugs. Above all, don't feel that asking for pain medication is a sign of failure. It isn't.
- **Focus on the big picture.** Keep in mind that labor is part of a process that ultimately leads to an event unmatched in the joy it can bring.

befitting an illness. Such cultural perspectives color the way that people in a given society view the experience and expectations about dealing with childbirth, as we discuss in the *Are You an Informed Consumer of Development?* section.

Birth: From Fetus to Neonate

LO 3.2 Explain the events that occur in the first few hours of a newborn's life.

The exact moment of birth occurs when the fetus, having left the uterus through the cervix, passes through the vagina to emerge fully from its mother's body. In most cases, babies automatically make the transition from taking in oxygen via the placenta to using their lungs to breathe air. Consequently, as soon as they are outside the mother's body, most newborns spontaneously cry. This helps them clear their lungs and breathe on their own.

What happens next varies from situation to situation and from culture to culture. In Western cultures, health-care workers are almost always on hand to assist with the birth. In the United States, 99 percent of births are attended by professional health-care workers, but in many less-developed countries less than half of births have professional health-care workers in attendance (United Nations Statistics Division, 2012).

THE APGAR SCALE. In most cases, the newborn infant first undergoes a quick visual inspection. Parents may be counting fingers and toes, but trained health-care workers look for something more. Typically, they employ the **Apgar scale**, a standard measurement system that looks for a variety of indications of good health (see Table 3-1). Developed by physician Virginia Apgar, the scale directs attention to five basic qualities, recalled most easily by using Apgar's name as a guide: *a*ppearance (color), *p*ulse (heart rate), *g*rimace (reflex irritability), *a*ctivity (muscle tone), and *r*espiration (respiratory effort).

Apgar scale
a standard measurement system that looks for a variety of indications of good health in newborns

Using the scale, health-care workers assign the newborn a score ranging from 0 to 2 on each of the five qualities, producing an overall score that can range from 0 to 10. The vast majority of children score 7 or above. The 10 percent of neonates who score under 7 require help to start breathing. Newborns who score under 4 need immediate, life-saving intervention.

Table 3-1 Apgar Scale

A score is given for each sign at 1 minute and 5 minutes after the birth. If there are problems with the baby, an additional score is given at 10 minutes. A score of 7 to 10 is considered normal, whereas 4 to 7 might require some resuscitative measures, and a baby with an Apgar score under 4 requires immediate resuscitation.

	Sign	0 Points	1 Point	2 Points
A	Appearance (skin color)	Blue-gray, pale all over	Normal, except for extremities	Normal over entire body
P	Pulse	Absent	Below 100 bpm	Above 100 bpm
G	Grimace (reflex irritability)	No response	Grimace	Sneezes, coughs, pulls away
A	Activity (muscle tone)	Absent	Arms and legs flexed	Active movement
R	Respiration	Absent	Slow, irregular	Good, crying

(**Source:** Apgar, 1953.)

Low Apgar scores (or low scores on other neonatal assessments, such as the *Brazelton Neonatal Behavioral Assessment Scale*, which we discuss in Chapter 4) may indicate problems or birth defects that were already present in the fetus. However, the process of birth itself may sometimes cause difficulties. Among the most profound are those relating to a temporary deprivation of oxygen.

At various junctures during labor, the fetus may lack sufficient oxygen. This can happen for any of a number of reasons. For instance, the umbilical cord may get wrapped around the neck of the fetus. The cord can also be pinched during a prolonged contraction, thereby cutting off the supply of oxygen that flows through it.

Lack of oxygen for a few seconds is not harmful to the fetus, but deprivation for any longer may cause serious harm. A restriction of oxygen, or **anoxia**, lasting a few minutes can produce cognitive deficits such as language delays and even mental retardation due to brain cell death (Rossetti, Carrera, & Oddo, 2012; Stecker, Wolfe, & Stevenson, 2013; Hynes, Fish, & Manly, 2014).

anoxia
a restriction of oxygen to the baby, lasting a few minutes during the birth process, that can produce brain damage

NEWBORN MEDICAL SCREENING. Just after birth, newborns typically are tested for a variety of diseases and genetic conditions. The American College of Medical Genetics recommends that all newborns be screened for 29 disorders, ranging from hearing difficulties and sickle-cell anemia to extremely rare conditions such as isovaleric acidemia, a disorder involving metabolism. These disorders can be detected from a tiny quantity of blood drawn from an infant's heel (American College of Medical Genetics, 2006).

The advantage of newborn screening is that it permits early treatment of problems that might go undetected for years. In some cases, devastating conditions can be prevented through early treatment of the disorder, such as the implementation of a particular kind of diet (Goldfarb, 2005; Kayton, 2007; Timmermans & Buchbinder, 2012).

The exact number of tests that a newborn experiences varies drastically from state to state. In some states, only three tests are mandated, while in others over 30 are required. In jurisdictions with only a few tests, many disorders go undiagnosed. In fact, each year around 1,000 infants in the United States suffer from disorders that could have been detected at birth if appropriate screening had been conducted.

The perfect image of newborns portrayed in commercials, television programs, and movies differs dramatically from reality.

PHYSICAL APPEARANCE AND INITIAL ENCOUNTERS. In addition to assessing the newborn's health, health-care workers deal with the remnants of the child's passage through the birth canal. You'll recall the description of the thick, greasy substance (like cottage cheese) that covers the newborn. This material, called *vernix*, smoothes the passage through the birth canal; it is no longer needed once the child is born and is quickly cleaned away. Newborns'

bodies are sometimes covered with a fine, dark fuzz known as *lanugo* that soon disappears. The newborn's eyelids may be puffy due to an accumulation of fluids during labor, and the newborn may have blood or other fluids on parts of its body.

After being cleansed, the newborn is usually returned to the mother and, if he is present, the father. The importance of this initial encounter between parent and child has become a matter of considerable controversy. Some psychologists and physicians argued that **bonding**, the close physical and emotional contact between parent and child during the period immediately following birth, was a crucial ingredient for forming a lasting relationship between parent and child (Lorenz, 1957). Their arguments were based in part on research conducted on nonhuman species such as ducklings. This work showed that there was a critical period just after birth when organisms showed a particular readiness to learn, or imprint, from other members of their species who happened to be present.

bonding
close physical and emotional contact between parent and child during the period immediately following birth, argued by some to affect later relationship strength

According to the concept of bonding applied to humans, a critical period begins just after birth and lasts only a few hours. During this period, actual skin-to-skin contact between mother and child supposedly leads to deep, emotional bonding. The corollary to this assumption is that if circumstances prevent such contact, the bond between mother and child will forever be lacking in some way. Because so many babies were taken from their mothers and placed in incubators or in the hospital nursery, medical practices often left little opportunity for sustained mother and child physical contact immediately after birth.

When developmental researchers carefully reviewed the research literature, however, they found little support for the existence of a critical period for bonding at birth. Although it does appear that mothers who have early physical contact with their babies are more responsive to them than those who don't have such contact, the difference lasts only a few days. Such news is reassuring to parents whose children must receive immediate, intensive medical attention just after birth. It is also comforting to parents who adopt children and are not present at their births (Miles et al., 2006; Bigelow & Power, 2012; Hall et al., 2014).

Although the observation of nonhuman animals highlights the importance of contact between mother and offspring following birth, research on humans suggests that immediate physical contact is less critical.

Although immediate mother–child bonding does not seem critical, it is important for newborns to be gently touched and massaged soon after birth. The physical stimulation they receive leads to the production of chemicals in the brain that instigate growth. Consequently, infant massage is related to weight gain, better sleep–waking patterns, better neuromotor development, and reduced rates of infant mortality (Field, 2001; Kulkarni et al., 2011; van Reenen & van Rensburg, 2013).

Approaches to Childbirth: Where Medicine and Attitudes Meet

LO 3.3 Describe some of the current approaches to childbirth.

> *In her second pregnancy, Alma Juarez knew she wanted something other than traditional obstetrics. No drugs. No lying flat on her back for the delivery (which had slowed her contractions and made an oxygen mask necessary). This time, Juarez took control. She joined an exercise class for pregnant women and read books on childbirth. She also chose a nurse-midwife instead of an obstetrician. She wanted someone to work with her, not dictate to her.*
>
> *When Juarez went into labor, she called the midwife, who met her at the hospital. Juarez was determined to stay on her feet, making use of gravity to hasten the birth. Her husband and the midwife took turns walking with her as the contractions got stronger. When she was fully dilated, she got on her hands and knees, a posture she knew would minimize the effort of pushing. Thirty minutes later, her daughter was born. No drugs, no extra oxygen. Juarez says, "The first birth, I was exhausted. The second birth, I was elated."*

Parents in the Western world have developed a variety of strategies—and some very strong opinions—to help them deal with something as natural as

giving birth, which occurs apparently without much thought throughout the nonhuman animal world. Today parents need to make a number of decisions. Should the birth take place in a hospital or in the home? Should a physician, a nurse, or a midwife assist? Is the father's presence desirable? Should siblings and other family members be on hand to participate in the birth?

Most of these questions cannot be answered definitively, primarily because the choice of childbirth techniques often comes down to a matter of values and opinions. No single procedure will be effective for all mothers and fathers, and no conclusive research evidence has proven that one procedure is significantly more effective than another. As we'll see, there is a wide variety of different issues and options involved, and certainly one's culture plays a role in choices of birthing procedures.

The abundance of choices is largely due to a reaction to traditional medical practices that had been common in the United States until the early 1970s. Before that time, the typical birth went something like this: A woman in labor was placed in a room with many other women, all of whom were in various stages of childbirth and some of whom were screaming in pain. Fathers and other family members were not allowed to be present. Just before delivery, the woman was rolled into a delivery room, where the birth took place. Often she was so drugged that she was not aware of the birth at all.

At the time, physicians argued that such procedures were necessary to ensure the health of the newborn and the mother. However, critics charged that alternatives were available that not only would maximize the medical well-being of the participants in the birth but also would represent an emotional and psychological improvement (Curl et al., 2004; Hotelling & Humenick, 2005).

Some women choose to use a midwife to assist them in their pregnancy and delivery.

ALTERNATIVE BIRTHING PROCEDURES. Not all mothers give birth in hospitals, and not all births follow a traditional course. Among the major alternatives to traditional birthing practices are the following:

- ***Lamaze birthing techniques.*** The Lamaze method has achieved widespread popularity in the United States. Based on the writings of Dr. Fernand Lamaze, the method makes use of breathing techniques and relaxation training (Lamaze, 1970). Typically, mothers-to-be participate in a series of weekly training sessions in which they learn exercises that help them relax various parts of the body on command. A "coach," most typically the father, is trained along with the future mother. The training allows women to cope with painful contractions by concentrating on their breathing and producing a relaxation response, rather than by tensing up, which can make the pain more acute. Women learn to focus on a relaxing stimulus, such as a tranquil scene in a picture. The goal is to learn how to deal positively with pain and to relax at the onset of a contraction (Lothian, 2005).

  Does the procedure work? Most mothers, as well as fathers, report that a Lamaze birth is a very positive experience. They enjoy the sense of mastery that they gain over the process of labor, a feeling of being able to exert some control over what can be a formidable experience. On the other hand, we can't be sure that parents who choose the Lamaze method aren't already more highly motivated about the experience of childbirth than parents who do not choose the technique. It is therefore possible that the accolades they express after Lamaze births are due to their initial enthusiasm and not to the Lamaze procedures themselves (Larsen et al., 2001; Zwelling, 2006).

Participation in Lamaze procedures—as well as other natural childbirth techniques in which the emphasis is on educating the parents about the process of birth and minimizing the use of drugs—is relatively rare among members of lower-income groups, including many members of ethnic minorities. Parents in these groups may not have the transportation, time, or financial resources to attend childbirth preparation classes. The result is that women in lower-income groups tend to be less prepared for the events of labor and consequently may suffer more pain during childbirth (Brueggemann, 1999; Lu et al., 2003).

- ***Bradley method.*** The Bradley method, which is sometimes known as "husband-coached childbirth," is based on the principle that childbirth should be as natural as possible and involve no medication or medical interventions. Women are taught to "tune into" their bodies in order to deal with the pain of childbirth. To prepare for childbirth, mothers-to-be are taught muscle relaxation techniques, similar to Lamaze procedures, and good nutrition and exercise during pregnancy are seen as important to prepare for delivery. Parents are urged to take responsibility for childbirth, and the use of physicians is viewed as unnecessary and sometimes even dangerous. As you might expect, the discouragement of traditional medical interventions is quite controversial (McCutcheon-Rosegg, Ingraham, & Bradley, 1996; Reed, 2005).
- ***Hypnobirthing.*** Hypnobirthing is a new, but increasingly popular, technique. It involves a form of self-hypnosis during delivery that produces a sense of peace and calm, thereby reducing pain. The basic concept is to produce a state of focused concentration in which a mother relaxes her body while focusing inward. Increasing research evidence shows the technique can be effective in reducing pain (Olson, 2006; White, 2007; Alexander, Turnball, & Cyna, 2009).
- ***Water Birthing.*** Still relatively uncommon in the United States, water birthing is a practice in which a woman enters a pool of warm water to give birth. The theory is that the warmth and buoyancy of the water is soothing, easing the length and pain of labor and childbirth, and the entry into the world is soothed for the infant, who moves from the watery environment of the womb to the birthing pool. Although there is some evidence that water birthing reduces pain and the length of labor, there is a risk of infection from the unsterile water (Thöni, Mussner, & Ploner, 2010; Jones et al., 2012).

With water birthing, the woman enters a pool of warm water to give birth.

CHILDBIRTH ATTENDANTS: WHO DELIVERS? Traditionally, *obstetricians*, physicians who specialize in delivering babies, have been the childbirth attendants of choice. In the last few decades, more mothers have chosen to use a *midwife*, a childbirth attendant who stays with the mother throughout labor and delivery. Midwives—most often nurses specializing in childbirth—are used primarily for pregnancies in which no complications are expected. The use of midwives has increased steadily in the United States—there are now 7,000 of them—and they are employed in 10 percent of births. Midwives help deliver some 80 percent of babies in other parts of the world, often at home. Home birth is common in countries at all levels of economic development. For instance, a third of all births in the Netherlands occur at home (Ayoub, 2005; Klein, 2012; Sandall, 2014).

From *a health-care worker's* perspective

While 99 percent of U.S. births are attended by professional medical workers or birthing attendants, this is the case in only about half of births worldwide. What do you think are some reasons for this, and what are the implications of this statistic?

The newest trend in childbirth assistance is also one of the oldest: the doula (pronounced doo-lah). A *doula* is trained to provide emotional, psychological, and educational support during birth. A doula does not replace an obstetrician or midwife, and does not do medical exams. Instead, doulas, who are often well-versed in birthing alternatives, provide the mother with support and make sure parents are aware of alternatives and possibilities regarding the birth process.

Although the use of doulas is new in the United States, they represent a return to an older tradition that has existed for centuries in other cultures. Although they may not be called "doulas," supportive, experienced older women have helped mothers as they give birth in non-Western cultures for centuries.

A growing body of research indicates that the presence of a doula is beneficial to the birth process, speeding deliveries and reducing reliance on drugs. Yet concerns remain about their use. Unlike certified midwives, who are nurses and receive an additional year or two of training, doulas do not need to be certified or have any particular level of education (Mottl-Santiago et al., 2008; Humphries, & Korfmacher, 2012; Simkin, 2014).

PAIN AND CHILDBIRTH. Any woman who has delivered a baby will agree that childbirth is painful. But how painful, exactly, is it?

Such a question is largely unanswerable. One reason is that pain is a subjective, psychological phenomenon, one that cannot be easily measured. No one is able to answer the question of whether their pain is "greater" or "worse" than someone else's pain, although some studies have tried to quantify it. For instance, in one survey women were asked to rate the pain they experienced during labor on a 1 to 5 scale, with 5 being the most painful (Yarrow, 1973). Nearly half (44 percent) said "5," and an additional one-quarter said "4."

Because pain is usually a sign that something is wrong in one's body, we have learned to react to pain with fear and concern. Yet during childbirth, pain is actually a signal that the body is working appropriately—that the contractions that are meant to propel the baby through the birth canal are doing their job. Consequently, the experience of pain during labor is difficult for women in labor to interpret, thereby potentially increasing their anxiety and making the contractions seem even more painful. Ultimately, every woman's delivery depends on such variables as how much preparation and support she has before and during delivery, her culture's view of pregnancy and delivery, and the specific nature of the delivery itself (Ip, Tang, & Goggins, 2009; de C. Williams et al., 2013; Karlsdottir, Halldorsdottir & Lundgren, 2014).

USE OF ANESTHESIA AND PAIN-REDUCING DRUGS. Among the greatest advances of modern medicine is the ongoing discovery of drugs that reduce pain. However, the use of medication during childbirth is a practice that holds both benefits and pitfalls.

About a third of women who receive anesthesia do so in the form of *epidural anesthesia*, which produces numbness from the waist down. Traditional epidurals produce an inability to walk and in some cases prevent women from helping to push the baby out during delivery. However, a newer form of epidural, known as a *walking epidural* or *dual spinal–epidural*, uses smaller needles and a system for administering continuous doses of anesthetic. It permits women to move about more freely during labor and has fewer side effects than traditional epidural anesthesia (Simmons et al., 2007).

It is clear that drugs hold the promise of greatly reducing, and even eliminating, pain associated with labor, which can be extreme and exhausting. However, pain reduction is

not without potential costs, because the drugs may affect the fetus and newborn by decreasing physiological responsiveness in the newborn. The stronger the drug, the greater the potential effects.

Still, most research suggests that drugs, as they are currently employed during labor, produce only minimal risks to the fetus and neonate. Guidelines issued by the American College of Obstetricians and Gynecologists suggest that a woman's request for pain relief at any stage of labor should be honored and that the proper use of minimal amounts of drugs for pain relief is reasonable and has no significant effect on a child's later well-being (ACOG, 2002; Alberts et al., 2007; Costa-Martins et al., 2014).

POSTDELIVERY HOSPITAL STAY: DELIVER, THEN DEPART? When New Jersey mother Diane Mensch was sent home from the hospital just a day after the birth of her third child, she still felt exhausted. But her insurance company insisted that 24 hours was sufficient time to recover, and it refused to pay for more. Three days later, her newborn was back in the hospital, suffering from jaundice. Mensch is convinced the problem would have been discovered and treated sooner had she and her newborn been allowed to remain in the hospital longer (Begley, 1995).

Mensch's experience is not unusual. In the 1970s, the average hospital stay for a normal birth was 3.9 days. By the 1990s, it was 2 days. These changes were prompted in large part by medical insurance companies, who advocated hospital stays of only 24 hours following birth in order to reduce costs.

Mothers who spend more time in the hospital following the birth of a child do better than those discharged after a shorter period.

Medical care providers have fought against this trend, believing that there are definite risks involved, both for mothers and for their newborns. For instance, mothers may begin to bleed if they tear tissue injured during childbirth. It is also riskier for newborns to be discharged prematurely from the sophisticated medical care that hospitals can provide. Furthermore, mothers are better rested and more satisfied with their medical care when they stay longer (Finkelstein, Harper, & Rosenthal, 1998).

In accordance with these views, the American Academy of Pediatrics states that women should stay in the hospital no less than 48 hours after giving birth, and the U.S. Congress has passed legislation mandating a minimum insurance coverage of 48 hours for childbirth (American Academy of Pediatrics Committee on Fetus and Newborn, 2004).

Module 3.1 Review

- In the first stage of labor, contractions increase in frequency, duration, and intensity until the baby's head is able to pass through the cervix. In the second stage, the baby moves through the cervix and birth canal and leaves the mother's body. In the third stage, the umbilical cord and placenta emerge.
- Immediately after birth, birthing attendants usually examine the neonate using a measurement system such as the Apgar scale. Newborns are also typically tested for a variety of diseases and genetic conditions. The newborn is usually returned to its parents shortly after birth so that they may hold and bond with the baby.
- Many birthing options are available to parents today. They may use a midwife or doula in addition to or instead of an obstetrician, and they may weigh the advantages and disadvantages of anesthetic drugs during birth. Some women choose alternatives to traditional hospital birthing, including the Lamaze method, the Bradley method, hypnobirthing, and water birthing.

Journal Writing Prompt

Applying Lifespan Development: Birthing practices in the United States have changed considerably since the 1970s. Describe any changes that have taken place in your country.

Birth Complications

When Ivy Brown's son was stillborn, a nurse told her that sad as it was, nearly 1 percent of births in her city, Washington, D.C., ended in death. That statistic spurred Brown to become a grief counselor, specializing in infant mortality. She formed a committee of physicians and city officials to study the capital's high infant mortality rate and find solutions to lower it. "If I can spare one mother this terrible grief, my loss will not be in vain," Brown says.

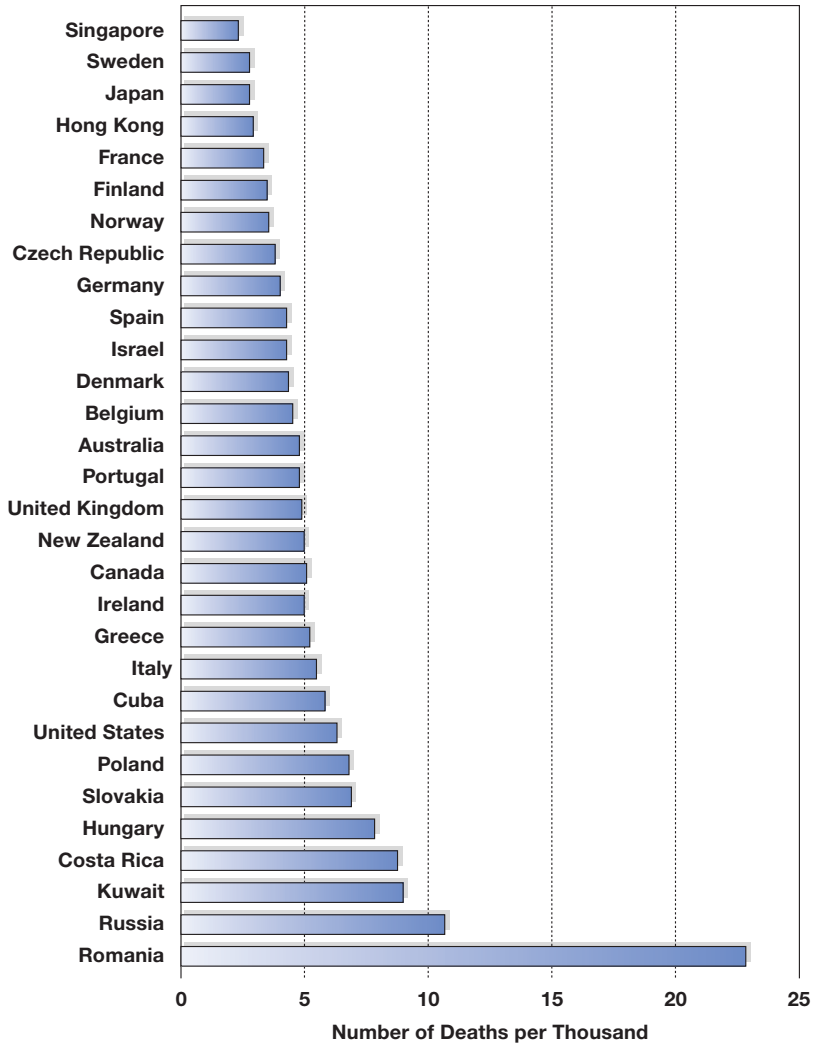
The infant mortality rate in the United States, the richest country in the world, is 6.17 deaths per 1,000 live births. Some wealthy countries, such as Japan, have an infant mortality rate that is half of that in the United States. Overall, nearly 50 countries have better birth rates than the United States (The World Factbook, 2012; Sun, 2012; see Figure 3-2).

Why is infant survival less likely in the United States than in quite a few less developed countries? To answer this question, we need to consider the nature of the problems that can occur during labor and delivery.

Figure 3-2 International Infant Mortality

Infant mortality rates in selected countries. Although the United States has greatly reduced its infant mortality rate in the past 25 years, it ranks only twenty-third among industrialized countries as of 2010. What are some of the reasons for this?

(**Source:** The World Factbook, 2010.)



Preterm Infants: Too Soon, Too Small

LO 3.4 **Describe some of the causes of, effects of, and treatments for preterm births.**

preterm infants
infants who are born prior to 38 weeks after conception (also known as premature infants)

Around one out of ten infants are born earlier than normal. **Preterm infants**, or premature infants, are born prior to 38 weeks after conception. Because they have not had time to develop fully as fetuses, preterm infants are at high risk for illness and death.

low-birthweight infants
infants who weigh less than 2,500 grams (around 5 1/2 pounds) at birth

The extent of danger faced by preterm babies largely depends on the child's weight at birth, which has great significance as an indicator of the extent of the baby's development. Although the average newborn weighs around 3,400 grams (about 7 1/2 pounds), **low-birthweight infants** weigh less than 2,500 grams (around 5 1/2 pounds). Only 7 percent of all newborns in the United States fall into the low-birthweight category, but they account for the majority of newborn deaths (Gross, Spiker, & Haynes, 1997; DeVader et al., 2007).

small-for-gestational-age infants
infants who, because of delayed fetal growth, weigh 90 percent (or less) of the average weight of infants of the same gestational age

Although most low-birthweight infants are preterm, some are small-for-gestational-age babies. **Small-for-gestational-age infants** are infants who, because of delayed fetal growth, weigh 90 percent (or less) of the average weight of infants of the same gestational age. Small-for-gestational-age infants are sometimes also preterm, but may not be. The syndrome may be caused by inadequate nutrition during pregnancy (Bergmann, Bergmann, & Dudenhausen, 2008; Salihu et al., 2013).

If the degree of prematurity is not too great and weight at birth is not extremely low, the threat to the child's well-being is relatively minor. In such cases, the main treatment may be to keep the baby in the hospital to gain weight. Additional weight is critical because fat layers help prevent chilling in neonates, who are not particularly efficient at regulating body temperature.

Research also shows that preterm infants who receive more responsive, stimulating, and organized care are apt to show more positive outcomes than those children whose care is not as good. Some of these interventions are quite simple. For example, "Kangaroo Care," in which infants are held skin-to-skin against their parents' chests, appears to be effective in helping preterm infants develop. Massaging preterm infants several times a day triggers the release of hormones that promote weight gain, muscle development, and abilities to cope with stress (Field et al., 2008; Kaffashi et al., 2013; Athanasopoulou & Fox, 2014).

Newborns who are born more prematurely and who have birthweights significantly below average face a tougher road. For them, simply staying alive is a major task. For instance, low-birthweight infants are highly vulnerable to infection, and because their lungs have not had sufficient time to develop completely, they have problems taking in sufficient oxygen. As a consequence, they may experience *respiratory distress syndrome* (RDS), with potentially fatal consequences.

Preterm infants stand a much greater chance of survival today than they did even a decade ago.

To deal with respiratory distress syndrome, low-birthweight infants are often placed in incubators, enclosures in which temperature and oxygen content are controlled. The exact amount of oxygen is carefully monitored. Too low a concentration of oxygen will not provide relief, and too high a concentration can damage the delicate retinas of the eyes, leading to permanent blindness.

The immature development of preterm neonates makes them unusually sensitive to stimuli in their environment. They can easily be overwhelmed by the sights, sounds, and sensations they experience, and their breathing may be interrupted or their heart rates may slow. They are often unable to move smoothly; their arm and leg movements are uncoordinated, causing them to jerk about and appear startled. Such behavior is quite disconcerting to parents (Doussard-Roosevelt et al., 1997; Miles et al., 2006; Valeri et al., 2014).

Despite the difficulties they experience at birth, the majority of preterm infants eventually develop normally in the long run. However, the tempo of development often proceeds more slowly for preterm children compared to children born at full term, and more subtle problems sometimes emerge later. For example, by the end of their first year, only 10 percent of prematurely born infants display significant problems, and only 5 percent are seriously disabled. By the age of 6, however, approximately 38 percent have mild problems that call for special educational interventions. For instance, some preterm children show learning disabilities, behavior disorders, or lower-than-average IQ scores. They also may be at greater risk for mental illness. Others have difficulties with physical coordination. Still, around 60 percent of preterm infants are free of even minor problems (Dombrowski, Noonan, & Martin, 2007; Hall et al., 2008; Nosarti et al., 2012).

VERY-LOW-BIRTHWEIGHT INFANTS: THE SMALLEST OF THE SMALL. The story is less positive for the most extreme cases of prematurity—very-low-birthweight infants. **Very-low-birthweight infants** weigh less than 1,250 grams (around 2 1/4 pounds) or, regardless of weight, have been in the womb less than 30 weeks.

very-low-birthweight infants infants who weigh less than 1,250 grams (around 2.25 pounds) or, regardless of weight, have been in the womb less than 30 weeks

Very-low-birthweight infants not only are tiny—some fitting easily in the palm of the hand at birth—they hardly seem to belong to the same species as full-term newborns. Their eyes may be fused shut and their earlobes may look like flaps of skin on the sides of their heads. Their skin is a darkened red color, whatever their race.

Very-low-birthweight babies are in grave danger from the moment they are born, due to the immaturity of their organ systems. Before the mid-1980s, these babies would not have survived outside their mothers' wombs. However, medical advances have led to a higher chance of survival, pushing the *age of viability*, the point at which an infant can survive prematurely, to about 22 weeks—some 4 months earlier than the term of a normal delivery. Of course, the longer the period of development beyond conception, the higher are a newborn's chances of survival. A baby born earlier than 25 weeks has less than a 50–50 chance of survival (see Figure 3-3; Seaton et al., 2012). As medical capabilities progress and developmental researchers come up with new strategies for dealing with preterm infants and improving their lives, the age of viability is likely to be pushed even earlier.

The physical and cognitive problems experienced by low-birthweight and preterm babies are even more pronounced in very-low-birthweight infants, with astonishing financial consequences. A three-month stay in an incubator in an intensive-care unit can run hundreds of thousands of dollars, and about half of these newborns ultimately die, despite massive medical intervention (Taylor et al., 2000).

Figure 3-3 Survival and Gestational Age

Chances of a fetus surviving greatly improve after 28 to 32 weeks. Rates shown are the number per thousand of babies born in the United States after specified lengths of gestation who survive the first year of life.

	United States	Austria	Denmark	England and Wales[2]	Finland	Northern Ireland	Norway	Poland	Scotland	Sweden
22–23 weeks[1]	707.7	888.9	947.4	880.5	900.0	1,000.0	555.6	921.1	1,000.0	515.2
24–27 weeks	236.9	319.6	301.2	298.2	315.8	268.3	220.2	530.6	377.0	197.7
28–31 weeks	45.0	43.8	42.2	52.2	58.5	54.5	56.4	147.7	60.8	41.3
32–36 weeks	8.6	5.8	10.3	10.6	9.7	13.1	7.2	23.1	8.8	12.8
37 weeks or more	2.4	1.5	2.3	1.8	1.4	1.6	1.5	2.3	1.7	1.5

1 Infant mortality rates at 22–23 weeks of gestation may be unreliable due to reporting differences.
2 England and Wales provided 2005 data.
NOTE: Infant mortality rates are per 1,000 live births in specified group.
SOURCE: NCHS linked birth/infant death data set (for U.S. data), and *European Perinatal Health Report* (for European data).

(**Source:** Based on MacDorman & Mathews, 2009.)

Even if a very-low-birthweight preterm infant survives, the medical costs can continue to mount. For instance, one estimate suggests that the average monthly cost of medical care for such infants during the first 3 years of life may be between 3 and 50 times higher than the medical costs for a full-term child. Such astronomical costs have raised ethical debates about the expenditure of substantial financial and human resources in cases in which a positive outcome may be unlikely (Prince, 2000; Doyle, 2004; Petrou, 2006).

WATCH THIS VIDEO ON MYPSYCHLAB

PREMATURE BIRTH AND THE NEONATAL INTENSIVE CARE UNIT

WHAT CAUSES PRETERM AND LOW-BIRTHWEIGHT DELIVERIES? About half of preterm and low-birthweight births are unexplained, but several known causes account for the remainder. In some cases, premature labor results from difficulties relating to the mother's reproductive system. For instance, mothers carrying twins have unusual stress placed on them, which can lead to early labor. In fact, most multiple births are preterm to some degree (Luke & Brown, 2008; Saul, 2009; Habersaat et al., 2014).

In other cases, preterm and low-birthweight babies are a result of the immaturity of the mother's reproductive system. Young mothers—under the age of 15—are more prone to deliver prematurely than older ones. In addition, a woman who becomes pregnant within 6 months of her previous pregnancy and delivery is more likely to deliver a preterm or low-birthweight infant than a woman whose reproductive system has had a chance to recover from a prior delivery. The father's age matters, too: Wives of older fathers are more likely to have preterm deliveries (Smith et al., 2003; Zhu & Weiss, 2005; Branum, 2006).

Finally, factors that affect the general health of the mother, such as nutrition, level of medical care, amount of stress in the environment, and economic support, all are related to prematurity and low birthweight. Rates of preterm births differ between racial groups, not because of race per se but because members of racial minorities have disproportionately lower incomes and higher stress as a result. For instance, the percentage of low-birthweight infants born to African American mothers is double that for Caucasian American mothers. (A summary of the factors associated with increased risk of low birthweight is shown in Table 3-2; Bergmann, Bergmann, & Dudenhausen, 2008; Butler, Wilson & Johnson, 2012; Teoli, Zullig & Hendryx, 2014.)

Table 3-2 Factors Associated with Increased Risk of Low Birthweight

I. Demographic Risks
- A. Age (less than 17; over 34)
- B. Race (minority)
- C. Low socioeconomic status
- D. Unmarried
- E. Low level of education

II. Medical Risks Predating Pregnancy
- A. Number of previous pregnancies (0 or more than 4)
- B. Low weight for height
- C. Genitourinary anomalies/surgery
- D. Selected diseases such as diabetes, chronic hypertension
- E. Nonimmune status for selected infections such as rubella
- F. Poor obstetric history, including previous low-birthweight infant, multiple spontaneous abortions
- G. Maternal genetic factors (such as low maternal weight at own birth)

III. Medical Risks in Current Pregnancy
- A. Multiple pregnancy
- B. Poor weight gain
- C. Short interpregnancy interval
- D. Low blood pressure
- E. Hypertension/preeclampsia/toxemia
- F. Selected infections such as asymptomatic bacteriuria, rubella, and cytomegalovirus
- G. First or second trimester bleeding
- H. Placental problems such as placenta previa
- I. Severe morning sickness
- J. Anemia/abnormal hemoglobin
- K. Severe anemia in a developing baby
- L. Fetal anomalies
- M. Incompetent cervix
- N. Spontaneous premature rupture of membrane

IV. Behavioral and Environmental Risks
- A. Smoking
- B. Poor nutritional status
- C. Alcohol and other substance abuse
- D. DES exposure and other toxic exposure, including occupational hazards
- E. High altitude

V. Health-Care Risks
- A. Absent or inadequate prenatal care
- B. Iatrogenic prematurity

VI. Evolving Concepts of Risks
- A. Stress (physical and psychosocial)
- B. Uterine irritability
- C. Events triggering uterine contractions
- D. Cervical changes detected before onset of labor
- E. Selected infections such as mycoplasma and chlamydia trachomatis
- F. Inadequate plasma volume expansion
- G. Progesterone deficiency

(**Source:** Reprinted with permission from Committee to Study the Prevention of Low Birth Weight, 1985, by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, DC.)

Postmature Babies: Too Late, Too Large

LO 3.5 Identify the risks that postmature babies face.

One might imagine that a baby who spends extra time in the womb might have some advantages, given the opportunity to continue growth undisturbed by the outside world. Yet **postmature infants**—those still unborn two weeks after the mother's due date—face several risks.

postmature infants
infants still unborn 2 weeks after the mother's due date

For example, the blood supply from the placenta may become insufficient to nourish the still-growing fetus adequately. Consequently, the blood supply to the brain may be decreased, leading to the potential of brain damage. Similarly, labor becomes riskier (for both the child and the mother) as a fetus—who may be equivalent in size to a one-month-old infant—has to make its way through the birth canal (Shea, Wilcox, & Little, 1998; Fok et al., 2006).

Difficulties involving postmature infants are more easily prevented than those involving preterm babies, since medical practitioners can induce labor artificially if the pregnancy continues too long. Not only can certain drugs bring on labor, but physicians also have the option of performing Cesarean deliveries, a form of delivery we consider next.

Cesarean Delivery: Intervening in the Process of Birth

LO 3.6 Describe the process of cesarean delivery and the reasons for its increase in use.

As Elena entered her eighteenth hour of labor, the obstetrician who was monitoring her progress began to look concerned. She told Elena and her husband, Pablo, that the fetal monitor revealed that the fetus's heart rate had begun to repeatedly fall after each contraction. After trying some simple remedies, such as repositioning Elena on her side, the obstetrician came to the conclusion that the fetus was in distress. She told them that the baby should be delivered immediately, and to accomplish that, she would have to carry out a Cesarean delivery.

Elena became one of the more than one million mothers in the United States who have a Cesarean delivery each year. In a **Cesarean delivery** (sometimes known as a *c-section*), the baby is surgically removed from the uterus rather than traveling through the birth canal.

Cesarean delivery
a birth in which the baby is surgically removed from the uterus, rather than traveling through the birth canal

fetal monitor
a device that measures the baby's heartbeat during labor

Cesarean deliveries occur most frequently when the fetus shows distress of some sort. For instance, if the fetus appears to be in danger, as indicated by a sudden rise in its heart rate or if blood is seen coming from the mother's vagina during labor, a Cesarean may be performed. In addition, mothers over the age of 40 are more likely to have Cesarean deliveries than younger ones (Tang et al., 2006; Romero, Coulson, & Galvin, 2012).

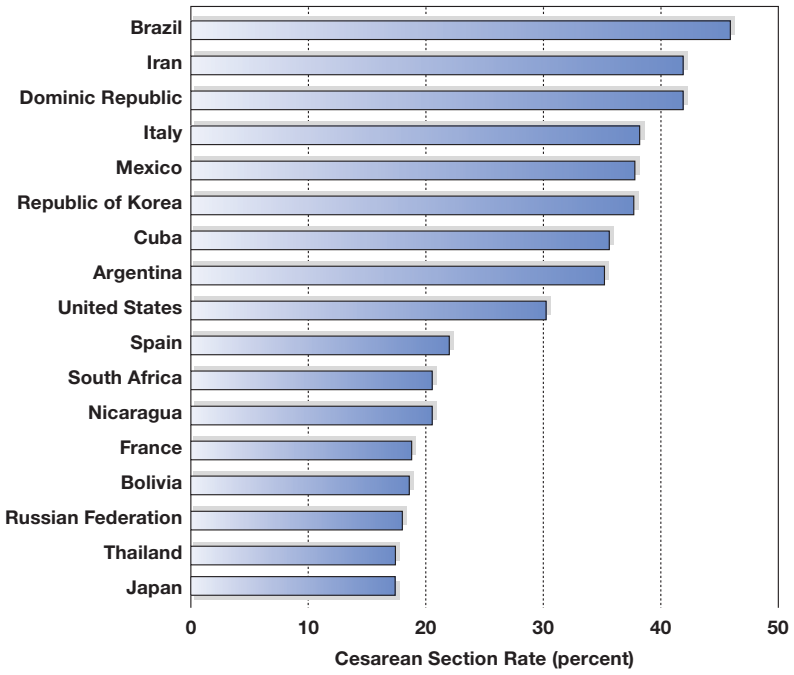
Cesarean deliveries are also used in some cases of *breech position*, in which the baby is positioned feet first in the birth canal. Breech position births, which occur in about 1 out of 25 births, place the baby at risk because the umbilical cord is more likely to be compressed, depriving the baby of oxygen. Cesarean deliveries are also more likely in *transverse position* births, in which the baby lies crosswise in the uterus, or when the baby's head is so large it has trouble moving through the birth canal.

The routine use of a **fetal monitor**, a device that measures the baby's heartbeat during labor, has contributed to a soaring rate of Cesarean deliveries. Nearly a third of all children in the United States are born in this way, up some 500 percent from the early 1970s, when the rate stood at 5 percent (Hamilton, Martin, & Ventura, 2011).

The use of fetal monitoring has contributed to a sharp increase of Cesarean deliveries in spite of evidence showing few benefits from the procedure.

Figure 3-4 Cesarean Deliveries

The rate at which Cesarean deliveries are performed varies substantially from one country to another. Why do you think the United States has a high rate?



Are Cesareans an effective medical intervention? Other countries have substantially lower rates of Cesarean deliveries (see Figure 3-4), and there is no association between successful birth consequences and the rate of Cesarean deliveries. In addition, Cesarean deliveries carry dangers. Cesarean delivery represents major surgery, and the mother's recovery can be relatively lengthy, particularly when compared to a normal delivery. In addition, the risk of maternal infection is higher with Cesarean deliveries (Miesnik & Reale, 2007; Hutcheon et al., 2013; Ryding et al., 2015).

Finally, a Cesarean delivery presents some risks for the baby. Because Cesarean babies are spared the stresses of passing through the birth canal, their relatively easy passage into the world may deter the normal release of certain stress-related hormones, such as catecholamines, into the newborn's bloodstream. These hormones help prepare the neonate to deal with the stress of the world outside the womb, and their absence may be detrimental to the newborn child. In fact, research indicates that babies born by Cesarean delivery who have not experienced labor are more likely to experience breathing problems upon birth than those who experience at least some labor prior to being born via a Cesarean delivery. Mothers who deliver by Cesarean are often less satisfied with the birth experience, but their dissatisfaction does not influence the quality of mother–child interactions (Porter et al., 2007; MacDorman et al., 2008; Xie et al., 2015).

Because the increase in Cesarean deliveries is, as we have said, connected to the use of fetal monitors, medical authorities now currently recommend that they not be used routinely. There is evidence that outcomes are no better for newborns who have been monitored than for those who have not been monitored. In addition, monitors tend to indicate fetal distress when there is none—false alarms—with disquieting regularity. Monitors do, however, play a critical role in high-risk pregnancies and in cases of preterm and postmature babies (Albers & Krulewitch, 1993; Freeman, 2007).

Studies examining what appear, in retrospect, to be unnecessary cesareans have found racial and socioeconomic differences. Specifically, black mothers are more likely to have a potentially unnecessary cesarean delivery than white mothers are. In addition, Medicare patients—who tend to be relatively poor—are more likely to have unnecessary cesarean deliveries than non-Medicare patients (Kabir et al., 2005).

Stillbirth and Infant Mortality: The Tragedy of Premature Death

LO 3.7 Describe rates of infant mortality and what factors affect these statistics.

The joy that accompanies the birth of a child is completely reversed when a newborn dies. The relative rarity of their occurrence makes infant deaths even harder for parents to bear.

Sometimes a child does not even live beyond its passage through the birth canal. **Stillbirth**, the delivery of a child who is not alive, occurs in fewer than 1 delivery out of 100. Sometimes the death is detected before labor begins. In this case, labor is typically induced, or physicians may carry out a Cesarean delivery in order to remove the body from the mother as soon as possible. In other cases of stillbirth, the baby dies during its travels through the birth canal.

stillbirth
the delivery of a child who is not alive, occurring in 1 delivery in 115 in the United States

The overall rate of **infant mortality** (defined as death within the first year of life) is 6.17 deaths per 1,000 live births. Infant mortality generally has been declining since the 1960s, and declined 12 percent from 2005 to 2011 (MacDorman et al., 2005; McDormatt, Hoyert, & Matthews, 2013; Loggins & Andrade, 2014).

infant mortality
death within the first year of life

Whether the death is a stillbirth or occurs after the child is born, the loss of a baby is tragic, and the impact on parents is enormous. The loss and grief parents feel, and their passage through it, is similar to that experienced when an older loved one dies (discussed in Chapter 19). The juxtaposition of the first dawning of life and an unnaturally early death may make the death particularly difficult to accept and handle. Depression is common, and it is often intensified owing to a lack of support. Some parents even experience post-traumatic stress disorder (Badenhorst et al., 2006; Cacciatore & Bushfield, 2007; Turton, Evans, & Hughes, 2009).

There are also differences related to race, socioeconomic, and culture in infant mortality, as we discuss in the *Developmental Diversity and Your Life* section.

Developmental Diversity and Your Life

Overcoming Racial and Cultural Differences in Infant Mortality

Even though there has been a general decline in the infant mortality rate in the United States over the past several decades, African American babies are more than twice as likely to die before the age of one than white babies. This difference is largely the result of socioeconomic factors: African American women are significantly more likely to be living in poverty than Caucasian women and to receive less prenatal care. As a result, their babies are more likely to be of low birthweight—the factor most closely linked to infant mortality—than infants of mothers of other racial groups (see Figure 3-5; Duncan & Brooks-Gunn, 2000; Byrd et al., 2007).

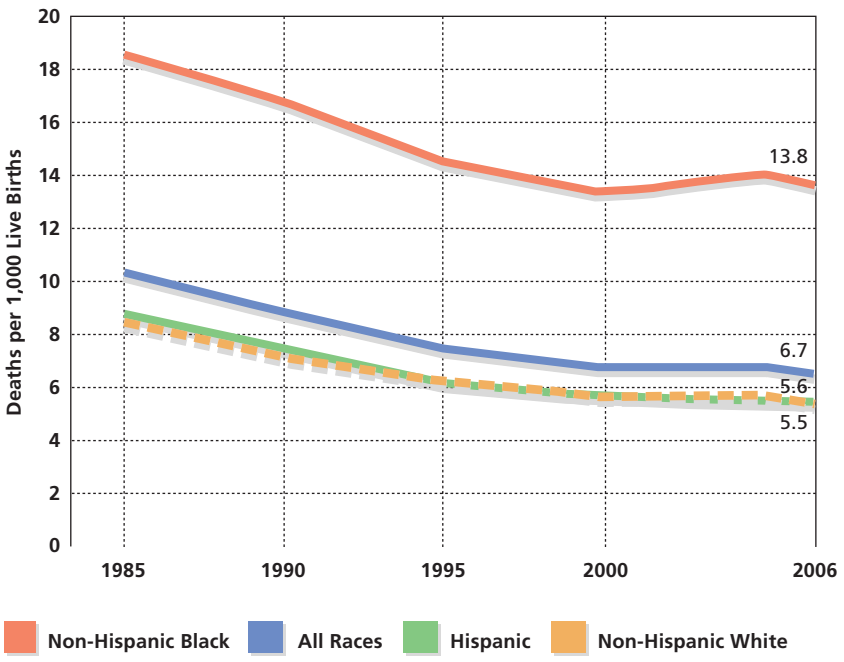


Figure 3-5 Race and Infant Mortality

Although infant mortality is dropping for both African American and white children, the death rate is still more than twice as high for African American children. These figures show the number of deaths in the first year of life for every 1,000 live births.

(**Source:** Child Health USA, 2009.)

But it is not just members of particular racial groups in the United States who suffer from poor mortality rates. As mentioned earlier, the rate of infant mortality in the United States is higher than the rate in many other countries. For example, the mortality rate in the United States is almost double that of Japan.

Why does the United States fare so poorly in terms of newborn survival? One answer is that the United States has a higher rate of low-birthweight and preterm deliveries than many other countries. When U.S. infants are compared to infants of the same weight who are born in other countries, the differences in mortality rates disappear (Wilcox et al., 1995; MacDorman et al., 2005; Davis & Hofferth, 2012).

Another reason for the higher U.S. mortality rate relates to economic diversity. The United States has a higher proportion of people living in poverty than many other countries. Because people in lower economic categories are less likely to have adequate medical care and tend to be less healthy, the relatively high proportion of economically deprived individuals in the United States impacts the overall mortality rate (Terry, 2000; Bremner & Fogel, 2004; MacDorman et al., 2005).

Many countries do a significantly better job than the United States in providing prenatal care to mothers-to-be. For instance, low-cost and even free care, both before and after delivery, is often available in other countries. Furthermore, paid maternity leave is frequently provided to pregnant women, lasting in some cases as long as 51 weeks (see Table 3-3).

In the United States, the U.S. Family and Medical Leave Act requires most employers to give new parents up to 12 weeks of unpaid leave following the birth (or adoption or foster care placement) of a child. However, because it is *unpaid* leave, the lack of pay is an enormous barrier for low-income workers, who rarely are able to take advantage of the opportunity to stay home with their child.

The opportunity to take an extended maternity leave can be important: Mothers who spend more time on maternity leave may have better mental health and higher quality interactions with their infants (Hyde et al., 1995; Clark et al., 1997; Waldfogel, 2001).

Better health care is only part of the story. In certain European countries, in addition to a comprehensive package of services involving general practitioner, obstetrician, and midwife, pregnant women receive many privileges, such as transportation benefits for visits to health-care providers. In Norway, pregnant women may be given living expenses for up to 10 days so that they can be close to a hospital when it is time to give birth. And when their babies are born, new mothers receive the assistance of trained home helpers for just a small payment (DeVries, 2005).

In the United States, the story is very different. About one out of every six pregnant women has insufficient prenatal care. Some 20 percent of white women and close to 40 percent of African American women receive no prenatal care early in their pregnancies. Five percent of white mothers and 11 percent of African American mothers do not see a health-care provider

Table 3-3 Childbirth-Related Leave Policies in the United States and 10 Peer Nations

Country	Type of Leave Provided	Total Duration (in months)	Payment Rate
United States	12 weeks of family leave	2.8	Unpaid
Canada	17 weeks maternity leave 10 weeks parental leave	6.2	15 weeks at 55 percent of prior earnings 55 percent of prior earnings
Denmark	28 weeks maternity leave 1 year parental leave	18.5	60 percent of prior earnings 90 percent of unemployment benefit rate
Finland	18 weeks maternity leave 26 weeks parental leave Child rearing leave until child is 3	36.0	70 percent of prior earnings 70 percent of prior earnings Flat rate
Norway	52 weeks parental leave 2 years child rearing leave	36.0	80 percent of prior earnings Flat rate
Sweden	18 months parental leave	18.0	12 months at 80 percent of prior earnings, 3 months flat rate, 3 months unpaid
Austria	16 weeks maternity leave 2 years parental leave	27.7	100 percent of prior earnings 18 months of unemployment benefit rate, 6 months unpaid
France	16 weeks maternity leave Parental leave until child is 3	36.0	100 percent of prior earnings Unpaid for one child; paid at flat rate (income is tested) for two or more
Germany	14 weeks maternity leave 3 years parental leave	39.2	100 percent of prior earnings Flat rate (income-tested) for 2 years, unpaid for third year
Italy	5 months maternity leave 6 months parental leave	11.0	80 percent of prior earnings 30 percent of prior earnings
United Kingdom	18 weeks maternity leave 13 weeks parental leave	7.2	90 percent for 6 weeks and flat rate for 12 weeks, if sufficient work history; otherwise, flat rate

(**Source:** "From Maternity to Parental Leave Policies: Women's Health, Employment, and Child and Family Well-Being," by S. B. Kamerman, 2000 (Spring), *The Journal of the American Women's Medical Association*, p. 55, Table 1; "Parental Leave Policies: An Essential Ingredient in Early Childhood Education and Care Policies," by S. B. Kamerman, 2000, *Social Policy Report*, p. 14, Table 1.0.)

until the last 3 months of pregnancy; some never see a health-care provider at all (Hueston, Geesey, & Diaz, 2008; Friedman, Heneghan, & Rosenthal, 2009; Cogan et al., 2012).

Ultimately, the lack of prenatal services results in a higher mortality rate. Yet this situation can be changed if greater support is provided. A start would be to ensure that all economically disadvantaged pregnant women have access to free or inexpensive high-quality medical care from the very beginning of pregnancy. Furthermore, barriers that prevent poor women from receiving such care should be reduced. For instance, programs can be developed that help pay for transportation to a health facility or for the care of older children while the mother is making a health-care visit. The cost of these programs is likely to be offset by the savings they make possible—healthy babies cost less than infants with chronic problems as a result of poor nutrition and prenatal care (Cramer et al., 2007; Edgerley et al., 2007; Barber & Gertler, 2009; Hanson, 2012).

From *an educator's* perspective

Why do you think the United States lacks educational and health-care policies that could reduce infant mortality rates overall and among poorer people? What arguments would you make to change this situation?

Postpartum Depression: Moving from the Heights of Joy to the Depths of Despair

LO 3.8 Describe the causes and effects of postpartum depression.

Renata had been overjoyed when she found out that she was pregnant and had spent the months of her pregnancy happily preparing for her baby's arrival. The birth was routine, the baby a healthy, pink-cheeked boy. But a few days after her son's birth, she sank into the depths of depression. Constantly crying, confused, and feeling incapable of caring for her child, she was experiencing unshakable despair.

The diagnosis: a classic case of postpartum depression. *Postpartum depression*, a period of deep depression following the birth of a child, affects some 10 percent of all new mothers. Although it takes several forms, its main symptom is an enduring, deep feeling of sadness and unhappiness, lasting in some cases for months or even years. In about 1 in 500 cases, the symptoms are even worse, evolving into a total break with reality. In extremely rare instances, postpartum depression may turn deadly. For example, Andrea Yates, a mother in Texas who was charged with drowning all five of her children in a bathtub, said that postpartum depression led to her actions (Yardley, 2001; Oretti et al., 2003; Misri, 2007).

For mothers who suffer from postpartum depression, the symptoms are often bewildering. The onset of depression usually comes as a complete surprise. Certain mothers do seem more likely to become depressed, such as those who have been clinically depressed at some point in the past or who have depressed family members. Furthermore, women who are unprepared for the range of emotions that follow the birth of a child—some positive, some negative—may be more prone to depression (Kim et al., 2008; LaCoursiere, Hirst, & Barrett-Connor, 2012).

Finally, postpartum depression may be triggered by the pronounced swings in hormone production that occur after birth. During pregnancy, production of the female hormones of estrogen and progesterone increases significantly. However, within the first 24 hours following birth, they plunge to normal levels. This rapid change may result in depression (Klier et al., 2007; Yim et al., 2009; Engineer et al., 2013; Glynn & Sandman, 2014).

Whatever the cause, maternal depression leaves its marks on the infant. As we'll see later in the chapter, babies are born with impressive social capacities, and they are highly attuned to the moods of their mothers. When depressed mothers interact with their infants, they are likely to display little emotion and to act detached and withdrawn. This lack of responsiveness leads infants to display fewer positive emotions and to withdraw from contact not only with their mothers but with other adults as well. In addition, children of depressed mothers are more prone to antisocial activities such as violence (Hay, Pawlby, & Angold, 2003; Nylen et al., 2006; Goodman et al., 2008).

Module 3.2 Review

- Largely because of low birthweight, preterm infants may have substantial difficulties after birth and later in life. Very-low-birthweight infants are in special danger because of the immaturity of their organ systems. Preterm and low-birthweight deliveries can be caused by health, age, and pregnancy-related factors in the mother. Income (and, because of its relationship with income, race) is also an important factor. Many preterm babies spend weeks or months in the neonatal intensive care unit receiving specialized care to help them develop.
- Postmature infants face certain risks, including loss of blood supply and difficult births due to their size.
- Cesarean deliveries are performed with postmature babies or when the fetus is in distress, in the wrong position, or unable to progress through the birth canal. The routine use of a fetal monitor has contributed to a soaring rate of Cesarean deliveries.
- The overall rate of infant mortality is 6.05 deaths per 1,000 live births. In the United States, African American babies are more than twice as likely to die before the age of one than white babies. Infant mortality rates can be affected by the availability of inexpensive health care and good education programs for mothers-to-be.
- Postpartum depression affects about 10 percent of new mothers and may be triggered by the pronounced swings in hormone production that occur after birth.

Journal Writing Prompt

Applying Lifespan Development: What are some of the causes of infant mortality? What can be done to reduce the infant mortality rate?

The Competent Newborn

Relatives gathered around the infant car seat and its occupant, Kaita Castro. Born just two days ago, Kaita is going home from the hospital with her mother. Kaita's nearest cousin, four-year-old Tabor, seems uninterested in the new arrival. "Babies can't do anything fun. They can't even do anything at all," he says.

Kaita's cousin Tabor is partly right. There are many things babies cannot do. Neonates arrive in the world quite incapable of successfully caring for themselves, for example. Why are human infants born so dependent, while members of other species seem to arrive much better equipped for their lives?

One reason is that, in one sense, humans are born too soon. The brain of the average newborn is just one-quarter of what it will be at adulthood. In comparison, the brain of the macaque monkey, which is born after just 24 weeks of gestation, is 65 percent of its adult size. Because of the relative puniness of the infant human brain, some observers have suggested that we are propelled out of the womb some 6 to 12 months sooner than we ought to be.

In reality, evolution probably knew what it was doing: If we stayed inside our mothers' bodies an additional half-year to a year, our heads would be so large that we'd never manage to get through the birth canal (Schultz, 1969; Gould, 1977; Kotre & Hall, 1990).

The relatively underdeveloped brain of the human newborn helps explain the infant's apparent helplessness. Because of this vulnerability, the earliest views of newborns focused on the things that they could not do, comparing them rather unfavorably to older members of the human species.

Today, however, such beliefs have taken a backseat to more favorable views of the neonate. As developmental researchers have begun to understand more about the nature of newborns, they have come to realize that infants enter this world with an astounding array of capabilities in all domains of development: physical, cognitive, and social.

Physical Competence: Meeting the Demands of a New Environment

LO 3.9 Describe the physical capabilities of the newborn.

The world faced by a neonate is remarkably different from the one it experienced in the womb. Consider, for instance, the significant changes in functioning that Kaita Castro

Table 3-4 Kaita Castro's First Encounters upon Birth

1.	As soon as she is through the birth canal, Kaita automatically begins to breathe on her own despite no longer being attached to the umbilical cord that provided precious air in the womb.
2.	Reflexes—unlearned, organized involuntary responses that occur in the presence of stimuli—begin to take over. Sucking and swallowing reflexes permit Kaita immediately to ingest food.
3.	The rooting reflex, which involves turning in the direction of a source of stimulation, guides Kaita toward potential sources of food that are near her mouth, such as her mother's nipple.
4.	Kaita begins to cough, sneeze, and blink—reflexes that help her avoid stimuli that are potentially bothersome or hazardous.
5.	Her senses of smell and taste are highly developed. Physical activities and sucking increase when she smells peppermint. Her lips pucker when a sour taste is placed on her lips.
6.	Objects with colors of blue and green seem to catch Kaita's attention more than other colors, and she reacts sharply to loud, sudden noises. She will also continue to cry if she hears other newborns cry but will stop if she hears a recording of her own voice crying.

encountered as she began the first moments of life in her new environment (summarized in Table 3-4).

Kaita's most immediate task was to bring sufficient air into her body. Inside her mother, air was delivered through the umbilical cord, which also provided a means for taking away carbon dioxide. The realities of the outside world are different: Once the umbilical cord was cut, Kaita's respiratory system needed to begin its lifetime's work.

For Kaita, the task was automatic. As we noted earlier, most newborn babies begin to breathe on their own as soon as they are exposed to air. The ability to breathe immediately is a good indication that the respiratory system of the normal neonate is reasonably well developed, despite its lack of rehearsal in the womb.

Neonates emerge from the uterus more practiced in other types of physical activities. For example, newborns such as Kaita show several **reflexes**—unlearned, organized involuntary responses that occur automatically in the presence of certain stimuli. Some of these reflexes are well rehearsed, having been present for several months before birth. The *sucking reflex* and the *swallowing reflex* permit Kaita to begin to ingest food right away. The *rooting reflex*, which involves turning in the direction of a source of stimulation (such as a light touch) near the mouth, is also related to eating. It guides the infant toward potential sources of food that are near its mouth, such as a mother's nipple.

reflexes
unlearned, organized, involuntary responses that occur automatically in the presence of certain stimuli

Not all of the reflexes that are present at birth lead the newborn to seek out desired stimuli such as food. For instance, Kaita can cough, sneeze, and blink—reflexes that help her to avoid stimuli that are potentially bothersome or hazardous.

Kaita's sucking and swallowing reflexes, which help her to consume her mother's milk, are coupled with the newfound ability to digest nutriments. The newborn's digestive system initially produces feces in the form of *meconium*, a greenish-black material that is a remnant of the neonate's days as a fetus.

Because the liver, a critical component of the digestive system, does not always work effectively at first, almost half of all newborns develop a distinctly yellowish tinge to their bodies and eyes. This change in color is a symptom of *neonatal jaundice.* It is most likely to occur in preterm and low-weight neonates, and it is typically not dangerous. Treatment most often consists of placing the baby under fluorescent lights or administering medicine.

The sucking and swallowing reflexes allow newborns to begin to ingest food immediately after birth.

Sensory Capabilities: Experiencing the World

LO 3.10 Describe the sensory capabilities of the newborn.

Just after Kaita was born, her father was certain that she looked directly at him. Did she, in fact, see him?

This is a hard question to answer for several reasons. For one thing, when sensory experts talk of "seeing," they mean both a sensory reaction due to the stimulation of

Starting at birth, infants are able to distinguish colors and even show preferences for particular ones.

the visual sensory organs and an interpretation of that stimulation (the distinction, as you might recall from an introductory psychology class, between sensation and perception). Furthermore, as we'll discuss further when we consider sensory capabilities during infancy in Chapter 4, it is tricky, to say the least, to pinpoint the specific sensory skills of newborns who lack the ability to explain what they are experiencing.

Still, we do have some answers to the question of what newborns are capable of seeing and, for that matter, questions about their other sensory capabilities. For example, it is clear that neonates such as Kaita can see to some extent. Although their visual acuity is not fully developed, newborns actively pay attention to certain types of information in their environment.

For instance, neonates pay closest attention to portions of scenes in their field of vision that are highest in information, such as objects that contrast sharply with the rest of their environment. Furthermore, infants can discriminate different levels of brightness. There is even evidence suggesting that newborns have a sense of size constancy. They seem aware that objects stay the same size, even though the size of the image on the retina varies with distance (Chien et al., 2006; Frankenhuis, Barrett, & Johnson, 2013; Wilkinson et al., 2014).

In addition, not only can newborn babies distinguish different colors, they seem to prefer particular ones. For example, they are able to distinguish between red, green, yellow, and blue, and they take more time staring at blue and green objects—suggesting a partiality for those colors (Dobson, 2000; Alexander & Hines, 2002; Zemach, Chang, & Teller, 2007).

Newborns are also clearly capable of hearing. They react to certain kinds of sounds, showing startle reactions to loud, sudden noises, for instance. They also exhibit familiarity with certain sounds. For example, a crying newborn will continue to cry when he or she hears other newborns crying. If the baby hears a recording of its own crying, on the other hand, he or she is more likely to stop crying, as if recognizing the familiar sound (Dondi, Simion, & Caltran, 1999; Fernald, 2001).

As with vision, however, the newborn's degree of auditory acuity is not as great as it will be later. The auditory system is not completely developed. Moreover, amniotic fluid, which is initially trapped in the middle ear, must drain out before the newborn can fully hear.

In addition to sight and hearing, the other senses also function quite adequately in the newborn. It is obvious that newborns are sensitive to touch. For instance, they respond to stimuli such as the hairs of a brush, and they are aware of puffs of air so weak that adults cannot notice them.

The senses of smell and taste are also well developed. Newborns suck and increase other physical activity when the odor of peppermint is placed near the nose. They also pucker their lips when a sour taste is placed on them, and they respond with suitable facial expressions to other tastes as well. Such findings clearly indicate that the senses of touch, smell, and taste are not only present at birth, but are reasonably sophisticated (Cohen & Cashon, 2003; Armstrong et al., 2008).

In one sense, the sophistication of the sensory systems of newborns such as Kaita is not surprising. After all, the typical neonate has had nine months to prepare for his or her encounter with the outside world, and human sensory systems begin their development well before birth. Furthermore, the passage through the birth canal may place babies in a state of heightened sensory awareness, preparing them for the world that they are about to encounter for the first time (also see the From Research to Practice box).

From Research to Practice

Are Food Preferences Learned in the Womb?

Do you have friends who have a taste for certain kinds of pungent or spicy foods that you think are just awful? And perhaps you have an affinity for garlic or curry that some of your friends don't share? Where do our seemingly quirky tastes for foods come from? Research suggests that at least some of our preferences were shaped in the womb.

When researchers gave women either unflavored capsules or garlic-flavored capsules to consume during the last weeks of their pregnancy, adult volunteers who were then asked to sniff samples of the women's amniotic fluid or breast milk could easily discern who had been eating the garlic. Because fetuses at this stage of development have the ability to taste and smell, it's a reasonable conclusion that if adults could detect the garlic, so too could the fetus. And when the newborns were offered garlic-flavored milk, those whose mothers were consuming garlic during pregnancy drank it happily while those whose mothers consumed no garlic rejected it. Experiments with other kinds of flavors showed similar results (Mennella & Beauchamp, 1996; Underwood, 2014).

Research with mice confirms a neurological basis for the link between exposure to flavors in utero and later taste preferences. When fetal mice were exposed to a mint flavor, the neural pathways were strengthened between the scent receptors for mint and the amygdala—a brain region involved in emotion (Todrank, Heth, & Restrepo, 2011).

Is it therefore likely that your food preferences today are lasting imprints of what your mother ate while carrying you? Probably not—tastes change over time as we become exposed to new foods and new flavor experiences. But where this very early influence on taste matters most is food preferences and aversions during infancy; this can be helpful to know, for example, in cases where an infant's condition requires a very specific kind of diet. And indeed, the foods that our mothers preferred while pregnant likely continued on as the foods that she would feed her family. Thus it stands to reason that those of us who were exposed to garlic or curry in the womb—and then continued to eat it throughout our childhood—would still have a taste for it today (Trabulsi & Mennella, 2012).

Shared Writing Prompt

What might be an evolutionary advantage to infants liking the kinds of foods their mothers eat?

Early Learning Capabilities

LO 3.11 Describe the learning capabilities of the newborn.

One-month-old Michael Samedi was on a car ride with his family when a thunderstorm suddenly began. The storm rapidly became violent, and flashes of lightning were quickly followed by loud thunderclaps. Michael was clearly disturbed and began to sob. With each new thunderclap, the pitch and fervor of his crying increased. Unfortunately, before very long it wasn't just the sound of the thunder that would raise Michael's anxiety; the sight of the lightning alone was enough to make him cry out in fear. Even as an adult, Michael feels his chest tighten and his stomach churn at the mere sight of lightning.

CLASSICAL CONDITIONING. The source of Michael's fear is classical conditioning, a basic type of learning first identified by Ivan Pavlov (and discussed in Chapter 1). In **classical conditioning**, an organism learns to respond in a particular way to a neutral stimulus that normally does not bring about that type of response.

classical conditioning
a type of learning in which an organism responds in a particular way to a neutral stimulus that normally does not bring about that type of response

Pavlov discovered that by repeatedly pairing two stimuli, such as the sound of a bell and the arrival of meat, he could make hungry dogs learn to respond (in this case by salivating) not only when the meat was presented, but even when the bell was sounded without the presence of meat (Pavlov, 1927).

The key feature of classical conditioning is stimulus substitution, in which a stimulus that doesn't naturally bring about a particular response is paired with a stimulus that does evoke that response. Repeatedly presenting the two stimuli together results in the second stimulus that takes the properties of the first. In effect, the second stimulus is substituted for the first.

One of the earliest examples of the power of classical conditioning in shaping human emotions was demonstrated in the case of an eleven-month-old infant known by researchers as "Little Albert" (Watson & Rayner, 1920; Fridlund et al., 2012). Although he initially adored furry animals and showed no fear of rats, Little Albert learned to fear them when, during a laboratory demonstration, a loud noise was sounded every time he played with

a cute and harmless white rat. In fact, the fear generalized to other furry objects, including rabbits and even a Santa Claus mask. (By the way, such a demonstration would be considered unethical today, and it would never be conducted.)

Infants are capable of learning very early through classical conditioning. For instance, one- and two-day-old newborns who are stroked on the head just before being given a drop of a sweet-tasting liquid soon learn to turn their heads and suck at the head-stroking alone. Clearly, classical conditioning is in operation from the time of birth (Blass, Ganchrow, & Steiner, 1984; Dominguez, Lopez, & Molina, 1999).

OPERANT CONDITIONING. But classical conditioning is not the only mechanism through which infants learn; they also respond to operant conditioning. As we noted in Chapter 1, **operant conditioning** is a form of learning in which a *voluntary* response is strengthened or weakened, depending on its association with positive or negative consequences. In operant conditioning, infants learn to act deliberately on their environments in order to bring about some desired consequence. An infant who learns that crying in a certain way is apt to bring her parents' immediate attention is displaying operant conditioning.

operant conditioning
a form of learning in which a voluntary response is strengthened or weakened, depending on its association with positive or negative consequences

Like classical conditioning, operant conditioning functions from the earliest days of life. For instance, researchers have found that even newborns readily learn through operant conditioning to keep sucking on a nipple when it permits them to continue hearing their mothers read a story or to listen to music (DeCasper & Fifer, 1980; Lipsitt, 1986a).

HABITUATION. Probably the most primitive form of learning is demonstrated by the phenomenon of habituation. **Habituation** is the decrease in the response to a stimulus that occurs after repeated presentations of the same stimulus.

habituation
the decrease in the response to a stimulus that occurs after repeated presentations of the same stimulus

Habituation in infants relies on the fact that when newborns are presented with a new stimulus, they produce an *orienting response*, in which they become quiet, attentive, and experience a slowed heart rate as they take in the novel stimulus. When the novelty wears off due to repeated exposure to the stimulus, the infant no longer reacts with this orienting response. If a new and different stimulus is presented, the infant once again reacts with an orienting response. When this happens, we can say that the infant has learned to recognize the original stimulus and to distinguish it from others.

WATCH THIS VIDEO ON MYPSYCHLAB
HABITUATION`

Habituation occurs in every sensory system, and researchers have studied it in several ways. One way is to examine changes in sucking, which stops temporarily when a new stimulus is presented. This reaction is not unlike that of an adult who temporarily puts down her knife and fork when a dinner companion makes an interesting statement to which she wishes to pay particular attention. Other measures of habituation include changes in heart rate, respiration rate, and the length of time an infant looks at a particular stimulus (Colombo & Mitchell, 2009; Macchi et al., 2012; Rosburg, Weigl, & Sörös, 2014).

The development of habituation is linked to physical and cognitive maturation. It is present at birth and becomes more pronounced over the first 12 weeks of infancy. Difficulties involving habituation

Table 3-5 Three Basic Processes of Learning

Type	Description	Example
Classical conditioning	A situation in which an organism learns to respond in a particular way to a neutral stimulus that normally does not bring about that type of response.	A hungry baby stops crying when her mother picks her up because she has learned to associate being picked up with subsequent feeding.
Operant conditioning	A form of learning in which a voluntary response is strengthened or weakened, depending on its positive or negative consequences.	An infant who learns that smiling at his or her parents brings positive attention may smile more often.
Habituation	The decrease in the response to a stimulus that occurs after repeated presentations of the same stimulus.	A baby who showed interest and surprise at first seeing a novel toy may show no interest after seeing the same toy several times.

represent a signal of developmental problems such as mental retardation (Moon, 2002). The three basic processes of learning that we've considered—classical conditioning, operant conditioning, and habituation—are summarized in Table 3-5.

This infant is imitating the happy responses of his father. Why is this important?

Social Competence: Responding to Others

LO 3.12 Describe the social competencies of newborns.

Soon after Kaita was born, her older brother looked down at her in her crib and opened his mouth wide, pretending to be surprised. Kaita's mother, looking on, was amazed when it appeared that Kaita imitated his expression, opening her mouth as if *she* were surprised.

Researchers registered surprise of their own when they first found that newborns did indeed have the capability to imitate others' behavior. Although infants were known to have all the muscles in place to produce facial expressions related to basic emotions, the actual appearance of such expressions was assumed to be largely random.

However, research beginning in the late 1970s began to suggest a different conclusion. For instance, developmental researchers found that when exposed to an adult modeling a behavior that the infant already performed spontaneously, such as opening the mouth or sticking out the tongue, the newborn appeared to imitate the behavior (Meltzoff & Moore, 1977, 2002; Nagy, 2006).

Even more exciting were findings from a series of studies conducted by developmental psychologist Tiffany Field and her colleagues (Field, 1982; Field & Walden, 1982; Field et al., 1984). They initially showed that infants could discriminate between such basic facial expressions as happiness, sadness, and surprise. They then exposed newborns to an adult model with a happy, sad, or surprised facial expression. The results suggested that newborns produced a reasonably accurate imitation of the adult's expression.

However, subsequent research seemed to point to a different conclusion, as other investigators found consistent evidence only for a single imitative movement: sticking out the tongue. And even that response seemed to disappear around the age of two months. Since it seems unlikely that imitation would be limited to a single gesture and only appear for a few months, some researchers began to question the earlier findings. Some researchers suggested that even sticking out the tongue was not imitation but merely an exploratory behavior (Jones, 2007; Tissaw, 2007; Huang, 2012).

The jury is still out on exactly when true imitation begins, although it seems clear that some forms of imitation begin very early in life. Such imitative skills are important because effective social interaction with others relies in part on the ability to react to other people in an appropriate manner and to understand the meaning of others' emotional states. Consequently, newborns' ability to imitate provides them with an important foundation for social interaction later in life (Meltzoff, 2002; Beisert, 2012; Nagy, Pal & Orvos, 2014).

Several other aspects of newborns' behavior also act as forerunners for more formal types of social interaction that they will develop as they grow. As shown in Table 3-6, certain characteristics of neonates mesh with parental behavior to help produce a social relationship between child and parent, as well as social relationships with others.

Table 3-6 Factors That Encourage Social Interaction between Full-Term Newborns and Their Parents

Newborn	Parent
Shows a preference for particular stimuli	Offers those stimuli more than others
Begins to show a predictable cycle of arousal states	Uses the observed cycle to achieve more regulated states
Shows some consistency in time patterns	Conforms to and shapes the newborn's patterns
Shows awareness of parent's actions	Helps newborn grasp intent of actions
Reacts and adapts to actions of parent	Acts in predictable, consistent ways
Shows evidence of a desire to communicate	Works to comprehend the newborn's communicative efforts

(**Source:** Based on Eckerman & Oehler, 1992.)

From a *child-care worker's* perspective

Developmental researchers no longer view the neonate as a helpless, incompetent creature, but rather as a remarkably competent, developing human being. What do you think are some implications of this change in viewpoint for methods of childrearing and child care?

states of arousal
different degrees of sleep and wakefulness through which newborns cycle, ranging from deep sleep to great agitation

For example, newborns cycle through various **states of arousal**, different degrees of sleep and wakefulness that range from deep sleep to great agitation. Caregivers become involved in trying to help ease the baby through transitions from one state to another. For instance, a father who rhythmically rocks his crying daughter in an effort to calm her is engaged in a joint activity that is a prelude to future social interactions of different sorts. Similarly, newborns tend to pay particular attention to their mothers' voices, in part because they have become quite familiar after months in the womb. In turn, parents and others modify their speech when talking to infants to gain their attention and encourage interaction, using a different pitch and tempo than they use with older children and adults (DeCasper & Fifer, 1980; Newman & Hussain, 2006; Smith & Trainor, 2008).

The ultimate outcome of the social interactive capabilities of the newborn infant, and the responses such behavior brings about from parents, is to pave the way for future social interactions. Just as the neonate shows remarkable skills on a physical and perceptual level, then, its social capabilities are no less sophisticated.

Module 3.3 Review

- Neonates are in many ways helpless, but studies of what they *can* do, rather than what they *can't* do, have revealed some surprising capabilities. For example, newborns' respiratory and digestive systems begin to function at birth. They also have an array of reflexes to help them eat, swallow, find food, and avoid unpleasant stimuli.
- Newborns' sensory competence includes the ability to distinguish objects in the visual field and to see color differences, the ability to hear and to discern familiar sounds, and sensitivity to touch, odors, and tastes.
- The processes of classical conditioning, operant conditioning, and habituation demonstrate infants' learning capabilities.
- Infants develop the foundations of social competence early in life.

Journal Writing Prompt

Applying Lifespan Development: Based on the sensory capabilities of a newborn, how would you design a toy such as a mobile to make it entertaining for a baby?

Epilogue

This chapter has covered the amazing and intense processes of labor and birth. A number of birthing options are available to parents, and these options need to be weighed in light of possible complications that can arise during the birthing process. In addition to considering the remarkable progress that has been made regarding the various treatments and interventions available for babies that are too early or too late, we examined the grim topics of stillbirth and infant mortality. We concluded with a discussion of the surprising capabilities of newborns and their early development of social competence.

Before we move on to a more detailed discussion of infants' physical development, let's return for a moment to the case of Ariana Campo's difficult labor, discussed in the prologue. Using your understanding of the issues discussed in this chapter, answer the following questions.

1. Exhaustion, and the epidural she was given to help her relax, made it impossible for Ariana to push her baby out when the time came. What complications could have arisen had her daughter's birth been delayed much further?
2. If Ariana's obstetrician had determined that her daughter could not be delivered with forceps, what else could have been done? What additional complications might have arisen?
3. Do you think giving Ariana an epidural to relieve her pain and exhaustion, though it impeded her ability to push, was a good decision? What else might her doctor have done to help her relax without resorting to medication?
4. Describe what Ariana's daughter's experiences immediately following birth would have been like.

Looking Back

LO 3.1 Describe the normal process of labor.

The first stage of labor contractions occur about every 8 to 10 minutes, increasing in frequency, duration, and intensity until the mother's cervix expands. In the second stage of labor, which lasts about 90 minutes, the baby begins to move through the cervix and birth canal and ultimately leaves the mother's body. In the third stage of labor, which lasts only a few minutes, the umbilical cord and placenta are expelled from the mother.

LO 3.2 Describe what occurs in the first few hours of a newborn's life.

After it emerges, the newborn, or neonate, is usually inspected for irregularities, cleaned, and returned to its mother and father. It also undergoes newborn screening tests.

LO 3.3 Describe some of the current approaches to childbirth.

Parents-to-be have a variety of choices regarding the setting for the birth, medical attendants, and whether to use pain-reducing medication. Sometimes, medical intervention, such as Cesarean birth, becomes necessary.

LO 3.4 Describe some of the causes of, effects of, and treatments for preterm births.

Preterm, or premature, infants, born less than 38 weeks following conception, generally have low birthweight, which can cause chilling, vulnerability to infection, respiratory distress syndrome, and hypersensitivity to environmental stimuli. They may even show adverse effects later in life, including slowed development, learning disabilities, behavior disorders, below-average IQ scores, and problems with physical coordination. Very-low-birthweight infants are in special danger because of the immaturity of their organ systems. However, medical advances have pushed the age of viability of the infant back to about 24 weeks following conception.

LO 3.5 Identify the risks that postmature babies face.

Postmature babies, who spend extra time in their mothers' wombs, are also at risk. However, physicians can artificially induce labor or perform a Cesarean delivery to address this situation.

LO 3.6 Describe the process of cesarean delivery and explain reasons for its increase in use.

Cesarean deliveries are performed when the fetus is in distress, in the wrong position, or unable to progress through the birth canal. The routine use of a fetal monitor has contributed to a soaring rate of Cesarean deliveries.

LO 3.7 Describe rates of infant mortality and what factors affect these statistics.

The infant mortality rate in the United States is higher than the rate in many other countries, and higher for low-income families than higher-income families.

LO 3.8 Describe the causes and effects of postpartum depression.

Postpartum depression, an enduring, deep feeling of sadness, affects about 10 percent of new mothers. In severe cases, its effects can be harmful to the mother and the child, and aggressive treatment may be employed.

LO 3.9 Describe the physical capabilities of the newborn.

Human newborns quickly master breathing through the lungs, and they are equipped with reflexes to help them eat, swallow, find food, and avoid unpleasant stimuli.

LO 3.10 Describe the sensory capabilities of the newborn.

Newborns' sensory competence includes the ability to distinguish objects in the visual field and to see color differences, the ability to hear and to discern familiar sounds, and sensitivity to touch, odors, and tastes.

LO 3.11 Describe the learning capabilities of the newborn.

From birth, infants learn through habituation, classical conditioning, and operant conditioning.

LO 3.12 Describe the social competencies of newborns.

Infants develop the foundations of social competence early in life. Newborns are able to imitate the behavior of others, a capability that helps them form social relationships and facilitates the development of social competence.

Key Terms and Concepts

neonate 106
episiotomy 107
Apgar scale 108
anoxia 109
bonding 110
preterm infants 116
low-birthweight infants 116
small-for-gestational-age infants 116
very-low-birthweight infants 117
postmature infants 119
Cesarean delivery 119
fetal monitor 119
stillbirth 121
infant mortality 121
reflexes 125
classical conditioning 127
operant conditioning 128
habituation 128
states of arousal 130

SUMMARY

1 Putting It All Together

Beginnings

RACHEL AND JACK looked forward to the birth of their second child. They speculated—just as developmentalists do—about the role of genetics and environment in their children's development, considering issues like intelligence, resemblance, personality, schooling, and neighborhood. For the birth itself, they had many options available. Rachel and Jack chose to use a midwife rather than an obstetrician and to give birth at a traditional hospital, but in a nontraditional way. And when their baby was born, both felt pride and happiness as Baby Eva reacted to the sound of her mother's voice, which she had heard from her intimate perch inside Rachel's body.

WHAT WOULD YOU DO?

- What would you say to Rachel and Jack about the impending birth of their child?
- What advice would you give to Rachel and Jack about prenatal care and their decision about the use of a midwife?

What's your response?

WHAT WOULD A PARENT DO?

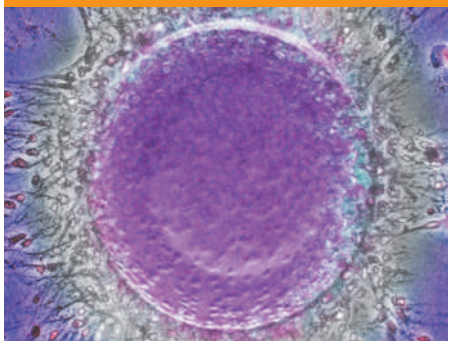
- What strategies would you use to prepare yourself for the upcoming birth of your child?
- How would you evaluate the different options for prenatal care and delivery?
- How would you prepare your older child for the birth of a new baby?

What's your response?

Introduction to Development

- Rachel and Jack considered the role of genetics (nature) versus environment (nurture) in thinking about what their child would be like.
- They also considered how their new child would develop physically, intellectually (or cognitively), and socially.

Prenatal Development



- Like all parents, Rachel and Jack contributed 23 chromosomes each at conception. Their baby's sex was determined from the particular mix of one pair of chromosomes.
- Many of Eva's characteristics will have a strong genetic component, but virtually all will represent some combination of genetics and environment.
- Rachel's prenatal development started as a fetus and progressed through a number of stages.

Birth and the Newborn

- Rachel's labor was intense and painful, although others experience labor in different ways due to individual and cultural differences.
- Like the vast majority of births, Rachel's was completely normal and successful.
- Rachel chose to use a midwife, one of several new birthing methods.
- Although Baby Eva seemed helpless and dependent, she actually possessed from birth an array of useful capabilities and skills.

WHAT WOULD A NURSE DO?

- How would you prepare Rachel and Jack for the upcoming birth of their baby?
- How would you respond to their concerns and anxieties?
- What would tell them about the different options they have for giving birth?

What's your response?

WHAT WOULD AN EDUCATOR DO?

- What strategies might you use to teach Rachel and Jack about the stages of pregnancy and the process of birth?
- What might you tell them about infancy to prepare them for caring for their child?

What's your response?

Chapter 4

Physical Development in Infancy

Learning Objectives

LO 4.1 Describe how the human body develops in the first two years of life, including the four principles that govern its growth.

LO 4.2 Describe how the nervous system and brain develop in the first two years of life and how the environment affects such development.

LO 4.3 Explain the body rhythms and states that govern an infant's behavior the first two years of life.

LO 4.4 Describe sudden infant death syndrome (SIDS) and guidelines to prevent it.

LO 4.5 Explain how the reflexes that infants are born with help them adapt to their surroundings and protect them.

LO 4.6 Summarize the landmarks of motor skill development in infancy.

LO 4.7 Summarize the role of nutrition in the physical development of infants.

LO 4.8 Summarize the benefits of breastfeeding in infancy.

LO 4.9 Describe the capabilities of infants in the realm of visual perception.

LO 4.10 Describe the capabilities of infants in the realm of auditory sensation and perception.

LO 4.11 Describe the smell and taste capacities of infants.

LO 4.12 Describe the nature of pain and touch in infants.

LO 4.13 Summarize the multimodal approach to perception.

Chapter Overview

Prologue: Dreaming of Sleep

Liz and Seth Kaufman are so exhausted they have a hard time staying awake through dinner. The problem? Their three-month-old son, Evan, who showed no signs of adopting normal patterns of eating and sleeping any time soon. "I thought babies were these big sleep fanatics, but Evan takes little cat naps of an hour throughout the night, and then stays awake all day," Liz says. "I'm running out of ways to entertain him because all I want to do is sleep."

Evan's feeding schedule was hard on Liz, too. "He wants to nurse every hour for five hours in a row, which makes it hard to keep up my milk supply. Then he goes another five hours *not* wanting to nurse, and I'm positively, painfully engorged." Seth tries to help out, walking at night with Evan when he won't sleep, offering him a bottle of Liz's expressed milk at 3 a.m. "But sometimes he just refuses the bottle," Seth says. "Only mommy will do."

The pediatrician has assured the Kaufmans that their son is healthy and blossoming. "We're pretty sure Evan will come out of this just fine," Liz says. "It's us we're wondering about." ■

Looking Ahead

Evan's parents can relax. Their son will settle down. Sleeping through the night is just one of the succession of milestones that characterize the dramatic physical attainments of infancy. In this chapter, we consider physical development during infancy, a period that starts at birth and continues until the second birthday. We begin by discussing the pace of growth, noting obvious changes in height and weight as well as less apparent changes in the nervous system. We also consider how infants quickly develop increasingly stable patterns in such basic activities as sleeping, eating, and attending to the world.

Our discussion then turns to infants' thrilling gains in motor development as skills emerge that eventually allow them to roll over, take the first step, and pick up a cookie crumb from the floor—skills that ultimately form the basis of even more complex behaviors. We start with basic, genetically determined reflexes and consider how even these may be modified through experience. We also discuss the nature and timing of the development of particular physical skills, look at whether their emergence can be speeded up, and consider the importance of early nutrition to their development.

Finally, we explore how infants' senses develop. We investigate how sensory systems such as hearing and vision operate, and how infants sort through the raw data from their sense organs and transform it into meaningful information.

Growth and Stability

Average newborns weigh just over 7 pounds, which is less than the weight of the average Thanksgiving turkey. They measure about 20 inches in length, shorter than a loaf of French bread. They are helpless; if left to fend for themselves, they could not survive.

Yet after just a few years, the story is very different. Babies grow much larger, they are mobile, and they become increasingly independent. How does this growth happen? We can answer this question first by describing the changes in weight and height that occur over the first two years of life, and then by examining some of the principles that underlie and direct that growth.

Physical Growth: The Rapid Advances of Infancy

LO 4.1 **Describe how the human body develops in the first two years of life, including the four principles that govern its growth.**

Infants grow at a rapid pace over the first two years of their lives (see Figure 4-1). By the age of five months, the average infant's birthweight has doubled to around 15 pounds. By the first birthday, the baby's weight has tripled to about 22 pounds. Although the pace of weight gain slows during the second year, by the end of his or her second year, the average child weighs around four times as much as he or she did at birth. Of course, there is a good deal of variation among infants. Height and weight measurements, which are taken regularly at physician's visits during a baby's first year, provide a way to spot problems in development.

The weight gains of infancy are matched by increased length. By the end of the first year, the typical baby grows almost a foot and is about 30 inches tall. By their second birthdays, children average a height of 3 feet.

Not all parts of an infant's body grow at the same rate. For instance, as we saw first in Chapter 2, at birth the head accounts for one-quarter of the newborn's entire body size. During the first two years of life, the rest of the body begins to catch up. By the age of two, the baby's head is only one-fifth of body length, and by adulthood it is only one-eighth (see Figure 4-2).

There are also gender and ethnic differences in weight and length. Girls generally are slightly shorter and weigh slightly less than boys—differences remain throughout childhood—and, as we will see later in the book, the disparities become considerably greater during adolescence. Furthermore, Asian infants tend to be slightly smaller than North American Caucasian infants, and African American infants tend to be slightly bigger than North American Caucasian infants.

Figure 4-1 Height and Weight Growth

Although the greatest increase in height and weight occurs during the first year of life, children continue to grow throughout infancy and toddlerhood.

(**Source:** Cratty, 1979.)

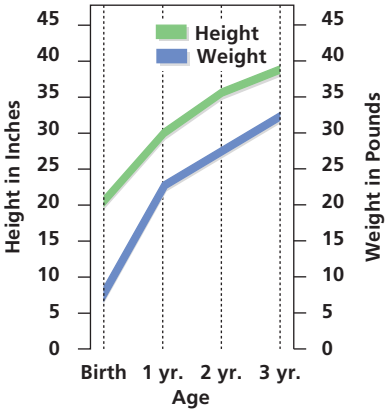


Figure 4-2 Decreasing Proportions

At birth, the head represents one-quarter of the neonate's body. By adulthood, the head is only one-eighth the size of the body. Why is the neonate's head so large?

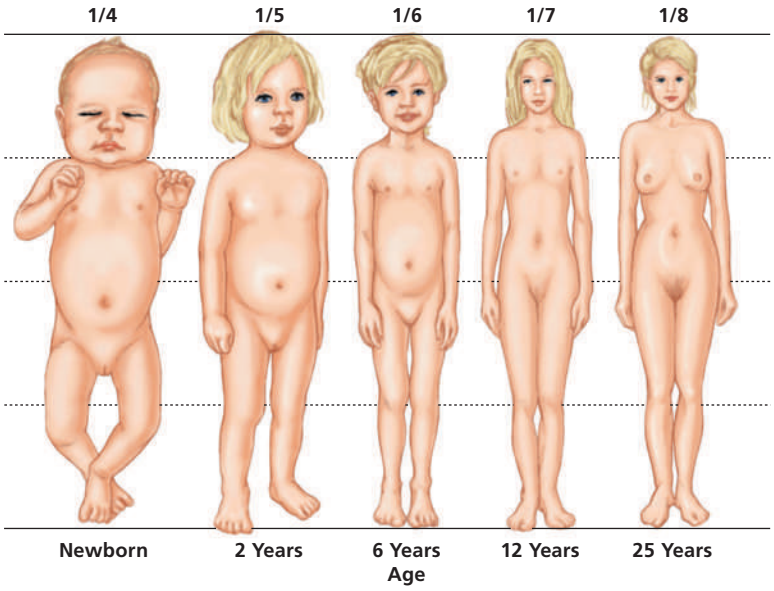


Table 4-1 The Major Principles Governing Growth

Cephalocaudal Principle	Proximodistal Principle	Principle of Hierarchical Integration	Principle of the Independence of Systems
Growth follows a pattern that begins with the head and upper body parts and then proceeds to the rest of the body. Based on Greek and Latin roots meaning "head-to-tail."	Development proceeds from the center of the body outward. Based on the Latin words for "near" and "far."	Simple skills typically develop separately and independently. Later they are integrated into more complex skills.	Different body systems grow at different rates.

FOUR PRINCIPLES OF GROWTH. The disproportionately large size of infants' heads at birth is an example of one of four major principles (summarized in Table 4-1) that govern growth:

- The **cephalocaudal principle** states that growth follows a direction and pattern that begins with the head and upper body parts and then proceeds to the rest of the body. The cephalocaudal growth principle means that we develop visual abilities (located in the head) well before we master the ability to walk (closer to the end of the body).
- The **proximodistal principle** states that development proceeds from the center of the body outward. The proximodistal principle means that the trunk of the body grows before the extremities of the arms and legs. Furthermore, development of the ability to use various parts of the body also follows the proximodistal principle. For instance, effective use of the arms precedes the ability to use the hands.
- The **principle of hierarchical integration** states that simple skills typically develop separately and independently but that these simple skills are integrated into more complex ones. Thus, the relatively complex skill of grasping something in the hand cannot be mastered until the developing infant learns how to control—and integrate—the movements of the individual fingers.
- Finally, the **principle of the independence of systems** suggests that different body systems grow at different rates. For instance, the patterns of growth for body size, the nervous system, and sexual maturation are quite different.

cephalocaudal principle
the principle that growth follows a pattern that begins with the head and upper body parts and then proceeds down to the rest of the body

proximodistal principle
the principle that development proceeds from the center of the body outward

principle of hierarchical integration
the principle that simple skills typically develop separately and independently but are later integrated into more complex skills

principle of the independence of systems
the principle that different body systems grow at different rates

The Nervous System and Brain: The Foundations of Development

LO 4.2 **Describe how the nervous system and brain develop in the first two years of life and how the environment affects such development.**

When Rina was born, she was the first baby among her parents' circle of friends. These young adults marveled at the infant, "oohing" and "aahing" at every sneeze and smile and whimper, trying to guess at their meaning. Whatever feelings, movements, and thoughts Rina was experiencing, they were all brought about by the same complex network: the infant's nervous system. The *nervous system* is composed of the brain and the nerves that extend throughout the body.

Neurons are the basic cells of the nervous system. Figure 4-3 shows the structure of an adult neuron. Like all cells in the body, neurons have a cell body containing a nucleus. But unlike other cells, neurons have a distinctive ability: They can communicate with other cells, using a cluster of fibers called *dendrites* at one end. Dendrites receive messages from other cells. At their opposite end, neurons have a long extension called an *axon*, the part of the neuron that carries messages destined for other neurons. Neurons do not actually touch one another. Rather, they communicate with other neurons by means of chemical messengers, *neurotransmitters* that travel across the small gaps, known as **synapses**, between neurons.

neuron
the basic nerve cell of the nervous system

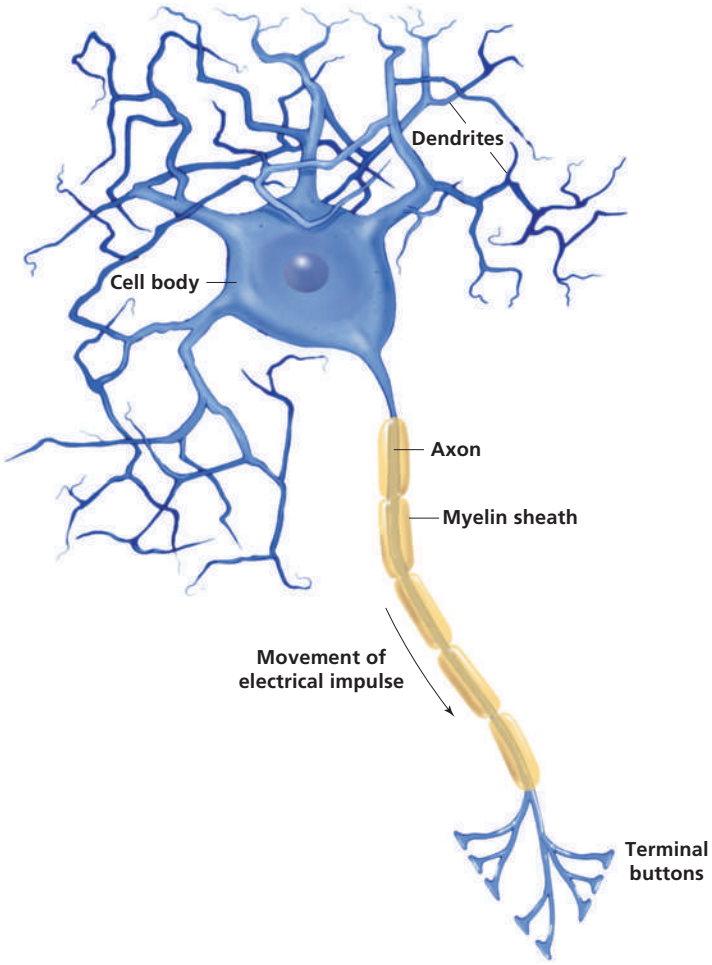
synapse
the gap at the connection between neurons, through which neurons chemically communicate with one another

WATCH THIS VIDEO ON MYPSYCHLAB SYNAPTIC DEVELOPMENT

Figure 4-3 The Neuron

The basic element of the nervous system, the neuron, has a number of components.

(**Source:** Van de Graaff, 2000.)



Although estimates vary, infants are born with between 100 and 200 billion neurons. In order to reach this number, neurons multiply at an amazing rate prior to birth. At some points in prenatal development, cell division creates some 250,000 additional neurons every minute.

At birth, most neurons in an infant's brain have relatively few connections to other neurons. During the first two years of life, however, a baby's brain will establish billions of new connections between neurons. Furthermore, the network of neurons becomes increasingly complex, as illustrated in Figure 4-4. The intricacy of neural connections continues to increase throughout life. In adulthood, a single neuron is likely to have a minimum of 5,000 connections to other neurons or other body parts.

SYNAPTIC PRUNING. Babies are actually born with many more neurons than they need. In addition, although synapses are formed throughout life based on our changing experiences, the billions of new synapses infants form during the first two years are more numerous than necessary. What happens to the extra neurons and synaptic connections?

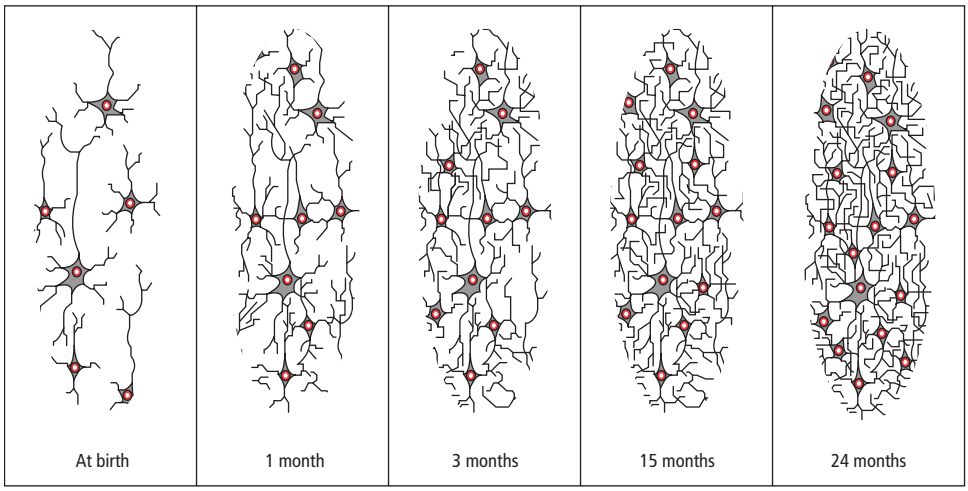
Like a farmer who, in order to strengthen the vitality of a fruit tree, prunes away unnecessary branches, brain development enhances certain capabilities in part by a "pruning down" of unnecessary neurons. Neurons that do not become interconnected with other neurons as the infant's experience of the world increases become unnecessary. They eventually die out, increasing the efficiency of the nervous system.

As unnecessary neurons are being reduced, connections between remaining neurons are expanded or eliminated as a result of their use or disuse during the baby's experiences. If a baby's experiences do not stimulate certain nerve connections, these, like

Figure 4-4 Neuron Networks

Over the first two years of life, networks of neurons become increasingly complex and interconnected. Why are these connections important?

(**Source:** Conel, 1930/1963.)



unused neurons, are eliminated—a process called **synaptic pruning**. The result of synaptic pruning is to allow established neurons to build more elaborate communication networks with other neurons. Unlike most other aspects of growth, then, the development of the nervous system proceeds most effectively through the loss of cells (Iglesias et al., 2005; Schafer & Stevens, 2013; Zong et al., 2015).

synaptic pruning
the elimination of neurons as the result of nonuse or lack of stimulation

After birth, neurons continue to increase in size. In addition to growth in dendrites, the axons of neurons become coated with **myelin**, a fatty substance that, like the insulation on an electric wire, provides protection and speeds the transmission of nerve impulses. So, even though many neurons are lost, the increasing size and complexity of the remaining ones contribute to impressive brain growth. A baby's brain triples its weight during his or her first two years of life, and it reaches more than three-quarters of its adult weight and size by the age of two.

myelin
a fatty substance that helps insulate neurons and speeds the transmission of nerve impulses

As they grow, the neurons also reposition themselves, becoming arranged by function. Some move into the **cerebral cortex**, the upper layer of the brain, while others move to *subcortical levels*, which are below the cerebral cortex. The subcortical levels, which regulate such fundamental activities as breathing and heart rate, are the most fully developed at birth. As time passes, however, the cells in the cerebral cortex, which are responsible for higher-order processes such as thinking and reasoning, become more developed and interconnected.

cerebral cortex
the upper layer of the brain

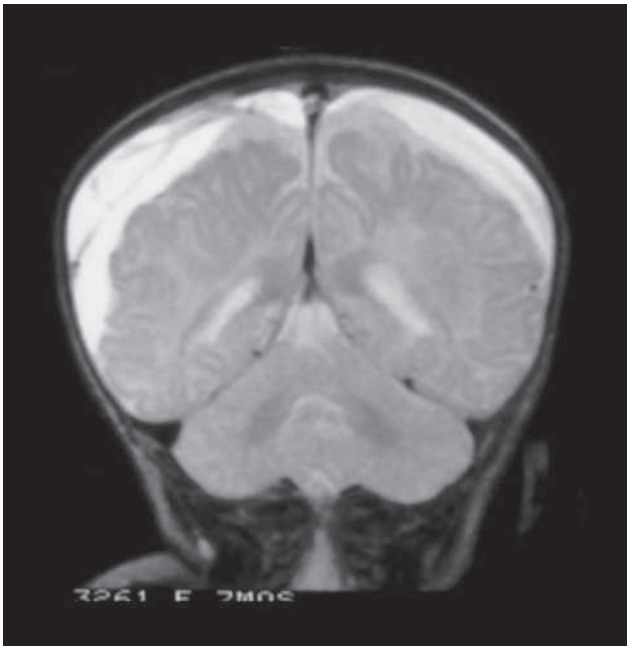
For example, synapses and myelinization experience a growth spurt at around three to four months in the area of the cortex involving auditory and visual skills (areas called the *auditory cortex* and the *visual cortex*). This growth corresponds to the rapid increase in auditory and visual skills. Similarly, areas of the cortex related to body movement grow rapidly, allowing for improvement in motor skills.

Although the brain is protected by the bones of the skull, it is highly sensitive to some forms of injury. One particularly devastating injury comes from a form of child abuse called *shaken baby syndrome* in which an infant is shaken by a caretaker or parent, usually out of frustration or anger due to a baby's crying. Shaking can lead the brain to rotate within the skull, causing blood vessels to tear and destroying the intricate connections between neurons (Figure 4-5). The results can be devastating, leading to severe medical problems, long-term physical disabilities such as blindness, hearing impairment, and speech disabilities. Some children experience learning disabilities and behavior disorders. In the most severe cases, the shaking leads to death. Estimates of the incidence of shaken baby syndrome range from 600 to 1,400 cases a year in the United States, and 25 percent of babies who are shaken ultimately die (Runyan, 2008; American Association of Neurological Surgeons, 2012; Hitchcock, 2012; Narang & Clarke, 2014).

Figure 4-5 Shaken Baby

This CAT scan shows severe brain injury in an infant suspected of being abused by caretaker shaking.

(**Source:** Matlung et al., 2011.)



ENVIRONMENTAL INFLUENCES ON BRAIN DEVELOPMENT. Brain development, much of which unfolds automatically because of genetically predetermined patterns, is also strongly susceptible to environmental influences. In fact, the brain's **plasticity**, the degree to which a developing structure or behavior is modifiable due to experience, is a significant attribute of it.

The brain's plasticity is greatest during the first several years of life. Because many areas of the brain are not yet devoted to specific tasks, if one area is injured, other areas can take over for the injured area. As a result, infants who suffer brain injuries typically are less affected and recover more fully than adults who have experienced similar types of brain injuries, showing the infants' high degree of plasticity. Of course, not even the brain's inherent plasticity can fully protect against severe injuries, such as those resulting from the violent shaking typical of shaken baby syndrome (Vanlierde, Renier, & De Volder, 2008; Mercado, 2009; Stiles, 2012).

Infants' sensory experiences affect both the size of individual neurons and the structure of their interconnections. Consequently, compared with those brought up in more enriched environments, infants raised in severely restricted settings are likely to show differences in brain structure and weight (Cirulli, Berry, & Alleva, 2003; Couperus & Nelson, 2006; Glaser, 2012).

Work with nonhumans has helped reveal the nature of the brain's plasticity. Studies have compared rats raised in an unusually visually stimulating environment to those raised in more typical, and less interesting, cages. Results of such research show that areas of the brain associated with vision are both thicker and heavier for the rats reared in enriched settings (Cynader, 2000; Degroot, Wolff, & Nomikos, 2005; Axelson et al., 2013). In contrast, environments that are unusually barren or in some way restricted may impede the brain's development. Again, work with nonhumans provides some intriguing data. In one classic study, young kittens were fitted with goggles that restricted their vision so that they could view only vertical lines (Hirsch & Spinelli, 1970). When the cats grew up and had their goggles removed, they were unable to see horizontal lines, although they saw vertical lines perfectly well. Analogously, kittens whose goggles restricted their vision of vertical lines early in life were effectively blind to vertical lines during their adulthood—although their vision of horizontal lines was accurate.

plasticity
the degree to which a developing structure or behavior is modifiable due to experience

On the other hand, when goggles are placed on older cats that have lived relatively normal lives as kittens, such results are not seen after the goggles are removed. The conclusion is that there is a sensitive period for the development of vision. As we noted in Chapter 1, a **sensitive period** is a specific, but limited, time, usually early in an organism's life, during which the organism is particularly susceptible to environmental influences relating to some particular facet of development. A sensitive period may be associated with a behavior—such as the development of full vision—or with the development of a structure of the body, such as the configuration of the brain (Uylings, 2006; Hartley & Lee, 2015).

sensitive period
a specific, but limited, time, usually early in an organism's life, during which the organism is particularly susceptible to environmental influences relating to some particular facet of development

From *a social worker's* perspective

What are some cultural or subcultural influences that might affect parents' childrearing practices?

The existence of sensitive periods raises several important issues. For one thing, it suggests that unless an infant receives a certain level of early environmental stimulation during a sensitive period, the infant may suffer damage or fail to develop capabilities, an

effect that can never be fully remedied. If this is true, providing successful later intervention for such children may prove to be particularly challenging (Gottlieb & Blair, 2004; Zeanah, 2009).

The opposite question also arises: Does an unusually high level of stimulation during sensitive periods produce developmental gains beyond what a more commonplace level of stimulation would provide?

Such questions have no simple answers. Determining how unusually impoverished or enriched environments affect later development is one of the major questions addressed by developmental researchers as they try to find ways to maximize opportunities for developing children.

In the meantime, many developmentalists suggest that there are many simple ways parents and caregivers can provide a stimulating environment that will encourage healthy brain growth. Cuddling, talking and singing to, and playing with babies all help enrich their environment. In addition, holding children and reading to them is important, as it simultaneously engages multiple senses, including vision, hearing, and touch (Garlick, 2003; Shoemark, 2014).

Integrating the Bodily Systems: The Life Cycles of Infancy

LO 4.3 Explain the body rhythms and states that govern an infant's behavior the first two years of life.

If you happen to overhear new parents discuss their newborns, chances are one or several bodily functions will be the subject. In the first days of life, infants' body rhythms—waking, eating, sleeping, and eliminating—govern the infant's behavior, often at seemingly random times.

These most basic activities are controlled by a variety of bodily systems. Although each of these individual behavioral patterns probably is functioning quite effectively, it takes some time and effort for infants to integrate the separate behaviors. One of the neonate's major missions is to make its individual behaviors work in harmony, helping the neonate for example, to sleep through the night (Ingersoll & Thoman, 1999; Waterhouse & DeCoursey, 2004).

RHYTHMS AND STATES. One of the most important ways that behavior becomes integrated is through the development of various **rhythms**, which are repetitive, cyclical patterns of behavior. Some rhythms are immediately obvious, such as the change from wakefulness to sleep. Others are more subtle, but still easily noticeable, such as breathing and sucking patterns. Still other rhythms may require careful observation to be noticed.

rhythms
repetitive, cyclical patterns of behavior

For instance, newborns may go through periods in which they jerk their legs in a regular pattern every minute or so. Although some of these rhythms are apparent just after birth, others emerge slowly over the first year as the neurons of the nervous system become increasingly integrated (Groome et al., 1997; Thelen & Bates, 2003).

One of the major body rhythms is that of an infant's **state**, the degree of awareness it displays to both internal and external stimulation. As can be seen in Table 4-2, such states include various levels of wakeful behaviors, such as alertness, fussing, and crying, and different levels of sleep as well. Each change in state brings about an alteration in the amount of stimulation required to get the infant's attention (Balaban, Snidman, & Kagan, 1997; Diambra & Menna-Barreto, 2004).

state
the degree of awareness an infant displays to both internal and external stimulation

Some of the different states that infants experience produce changes in electrical activity in the brain. These changes are reflected in different patterns of electrical *brain waves*, which can be measured by a device called an *electroencephalogram*, or *EEG*. Starting at three months before birth, these brain wave patterns are relatively irregular. However, by the time an infant reaches the age of three months, a more mature pattern emerges and the brain waves become more regular (Thordstein et al., 2006; Cuevas et al., 2015).

Infants cycle through various states, including crying and alertness. These states are integrated through bodily rhythms.

Table 4-2 Primary Behavioral States

States	Characteristics	Percentage of Time When in State
Awake States		
Alert	Attentive or scanning, the infant's eyes are open, bright, and shining.	6.7
Nonalert waking	Eyes are usually open but dull and unfocused. Varied, but typically high motor activity.	2.8
Fuss	Fussing is continuous or intermittent, at low levels.	1.8
Cry	Intense vocalizations occurring singly or in succession.	1.7
Transition States between Sleep and Waking		
Drowse	Infant's eyes are heavy-lidded but opening and closing slowly. Low level of motor activity.	4.4
Daze	Open but glassy and immobile eyes. State occurs between episodes of alert and drowse. Low level of activity.	1.0
Sleep–wake transition	Behaviors of both wakefulness and sleep are evident. Generalized motor activity; eyes may be closed or they open and close rapidly. State occurs when baby is awakening.	1.3
Sleep States		
Active sleep	Eyes closed; uneven respiration; intermittent rapid eye movements. Other behaviors: smiles, frowns, grimaces, mouthing, sucking, sighs, and sigh-sobs.	50.3
Quiet sleep	Eyes are closed and respiration is slow and regular. Motor activity limited to occasional startles, sigh-sobs, or rhythmic mouthing.	28.1
Transitional Sleep States		
Active–quiet transition sleep	During this state, which occurs between periods of active sleep and quiet sleep, the eyes are closed and there is little motor activity. Infant shows mixed behavioral signs of active sleep and quiet sleep.	1.9

(**Source:** Adapted from Thomas & Whitney, 1990.)

SLEEP: PERCHANCE TO DREAM? At the beginning of infancy, the major state that occupies a baby's time is sleep—much to the relief of exhausted parents, who often regard sleep as a welcome respite from caregiving responsibilities. On average, newborn infants sleep some 16 to 17 hours a day. However, there are wide variations. Some sleep more than 20 hours, while others sleep as little as 10 hours a day (Buysse, 2005; Tikotzky & Sadeh, 2009; de Graag et al., 2012).

Infants sleep a lot, but you probably shouldn't ever wish to "sleep like a baby." The sleep of infants comes in fits and starts. Rather than covering one long stretch, sleep initially comes in spurts of around two hours, followed by periods of wakefulness. Because of this, infants—and their sleep-deprived parents—are "out of sync" with the rest of the world, for whom sleep comes at night and wakefulness during the day (Groome et al., 1997; Burnham et al., 2002).

In addition, most babies do not sleep through the night for several months after birth. Parents' sleep is interrupted, sometimes several times a night, by the infant's cries for food and physical contact.

Luckily for their parents, infants gradually settle into a more adult-like pattern. After a week, babies sleep a bit more at night and are awake for slightly longer periods during the day. Typically, by the age of 16 weeks, infants begin to sleep as much as 6 continuous hours at night, and daytime sleep falls into regular nap-like patterns. Most infants sleep through the night by the end of the first year, and the total amount of sleep they need each day is down to about 15 hours (Mao et al., 2004; Magee, Gordon & Caputi, 2014).

Hidden beneath the supposedly tranquil sleep of infants is another cyclic pattern. During periods of sleep, infants' heart rates increase and become irregular, their blood pressure rises, and they begin to breathe more rapidly (Montgomery-Downs & Thomas, 1998). Sometimes, though not always, their closed eyes begin to move in a back-and-forth pattern, as if they were viewing an action-packed scene. This period of active sleep is similar, though not identical, to the **rapid eye movement**, or **REM**, **sleep** that is found in older children and adults and is associated with dreaming.

rapid eye movement (REM) sleep the period of sleep that is found in older children and adults and is associated with dreaming

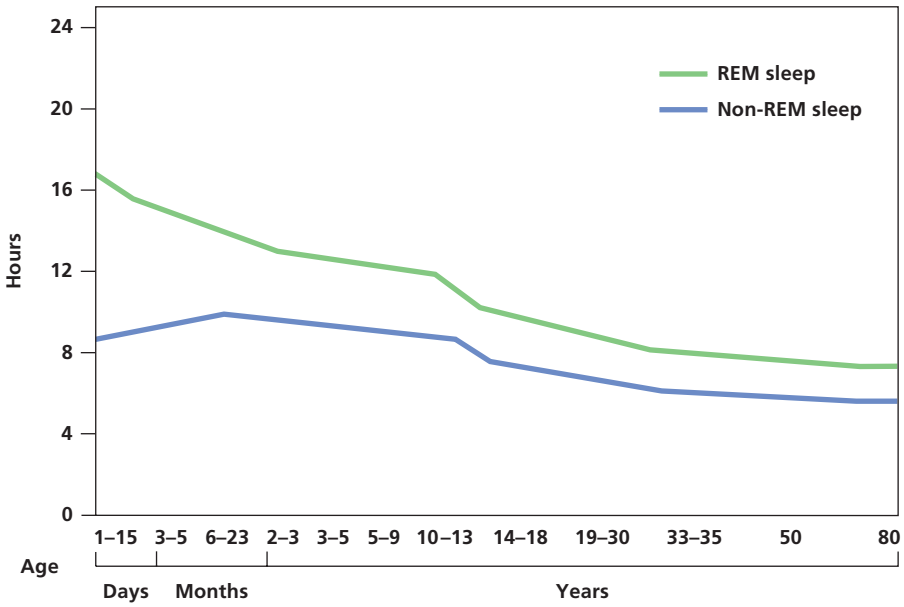
At first, this active, REM-like sleep takes up around one-half of an infant's sleep, compared with just 20 percent of an adult's sleep (see Figure 4-6). However, the quantity of active sleep quickly declines, and by the age of six months, it amounts to just one-third of total sleep time (Coons & Guilleminault, 1982; Burnham et al., 2002; Staunton, 2005).

The appearance of active sleep periods that are similar to REM sleep in adults raises the intriguing question of whether infants dream during those periods. No one knows the answer, although it seems unlikely. First of all, young infants do not have much to dream about, given their relatively limited experiences. Furthermore, the brain waves of sleeping infants appear to be qualitatively different from those of adults who are dreaming. It is not until the baby reaches three or four months of age that the wave patterns become similar to those of dreaming adults, suggesting that young infants are not dreaming during active sleep—or at least are not doing so in the same way as adults (Parmelee & Sigman, 1983; Zampi, Fagidi, & Salzarulo, 2002).

Figure 4-6 REM Sleep through the Life Span

As we age, the proportion of REM sleep increases as the proportion of non-REM sleep declines. In addition, the total amount of sleep falls as we get older.

(**Source:** Based on Roffwarg, Muzio, & Dement, 1966.)



Then what is the function of REM sleep in infants? Although we don't know for certain, some researchers think it provides a means for the brain to stimulate itself—a process called *autostimulation* (Roffwarg, Muzio, & Dement, 1966). Stimulation of the nervous system would be particularly important in infants, who spend so much time sleeping and relatively little in alert states.

Infants' sleep cycles seem largely preprogrammed by genetic factors, but environmental influences also play a part. For instance, both long- and short-term stressors in infants' environments (such as a heat wave) can affect their sleep patterns. When environmental circumstances keep babies awake, sleep, when at last it comes, is apt to be less active (and quieter) than usual (Goodlin-Jones, Burnham, & Anders, 2000; Galland et al., 2012).

Cultural practices also affect infants' sleep patterns. For example, among the Kipsigis of Africa, infants sleep with their mothers at night and are allowed to nurse whenever they wake. In the daytime, they accompany their mothers during daily chores, often napping while strapped to their mothers' backs. Because they are often out and on the go, Kipsigis infants do not sleep through the night until much later than babies in Western societies, and for the first eight months of life, they seldom sleep longer than three hours at a stretch. In comparison, eight-month-old infants in the United States may sleep as long as eight hours at a time (Super & Harkness, 1982; Anders & Taylor, 1994; Gerard, Harris, & Thach, 2002).

SIDS: The Unanticipated Killer

LO 4.4 Describe sudden infant death syndrome (SIDS) and guidelines to prevent it.

sudden infant death syndrome (SIDS)
the unexplained death of a seemingly healthy baby

For a tiny percentage of infants, the rhythm of sleep is interrupted by a deadly affliction: sudden infant death syndrome. **Sudden infant death syndrome (SIDS)** is a disorder in which seemingly healthy infants die in their sleep. Put to bed for a nap or for the night, an infant simply never wakes up.

SIDS strikes about 1 in 2,500 infants in the United States each year. Although it seems to occur when the normal patterns of breathing during sleep are interrupted, scientists have been unable to discover why that might happen. It is clear that infants don't smother or choke; they die a peaceful death, simply ceasing to breathe.

While no reliable means for preventing the syndrome have been found, the American Academy of Pediatrics now suggests that babies sleep on their backs rather than on their sides or stomachs—called the *back-to-sleep* guideline. In addition, it suggests that parents consider giving their babies a pacifier during naps and bedtime (Task Force on Sudden Infant Death Syndrome, 2005; Senter et al., 2011; Ball & Volpe, 2013).

The number of deaths from SIDS has decreased significantly since these guidelines were developed (see Figure 4-7). Still, SIDS is the leading cause of death in children under the age of one year in the United States (Eastman, 2003; Daley, 2004; Blair et al., 2006).

Some infants are more at risk for SIDS than others. For instance, boys and African Americans are at greater risk. In addition, low birthweight and low Apgar scores found at birth are associated with SIDS, as is having a mother who smokes during pregnancy. Some evidence also suggests that a brain defect that affects breathing may produce SIDS. In a small number of cases, child abuse may be the actual cause. Still, there is no clear-cut factor that explains why some infants die from the syndrome. SIDS is found in children of every race and socioeconomic group and in children who have had no apparent health problems (Howard, Kirkwood, & Latinovic, 2007; Richardson, Walker, & Horne, 2009; Behm et al., 2012).

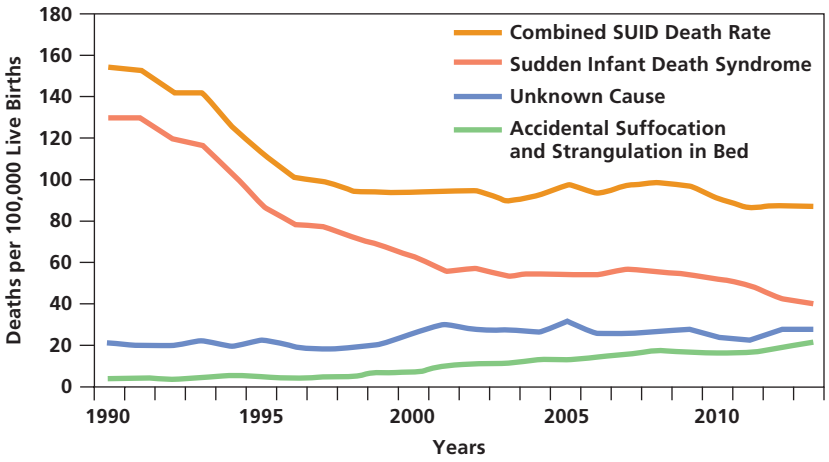
Many hypotheses have been suggested to explain why infants die from SIDS. These include such problems as undiagnosed sleep disorders, suffocation, nutritional deficiencies, problems with reflexes, and undiagnosed illness. Still, the actual cause of SIDS remains elusive (Kinney & Thach, 2009; Mitchell, 2009; Freyne et al., 2014).

Because parents are unprepared for the death of an infant from SIDS, the event is particularly devastating. Parents often feel guilt, fearing that they were neglectful or somehow contributed to their child's death. Such guilt is unwarranted, since nothing has been identified so far that can invariably prevent SIDS (Krueger, 2006).

Figure 4-7 Declining Rates of SIDS

In the United States, SIDS rates have dropped dramatically as parents have become more informed and put babies to sleep on their backs instead of their stomachs. SUID: sudden unexpected infant death.

(**Source:** American SIDS Institute, based on data from the Center for Disease Control and the National Center for Health Statistics, 2004, National Vital Statistics System, Compressed Mortality File.)



Module 4.1 Review

- The major principles of growth are the cephalocaudal principle, the proximodistal principle, the principle of hierarchical integration, and the principle of the independence of systems.
- The development of the nervous system first entails the development of billions of neurons and interconnections among them. Later, the numbers of both neurons and connections decrease as a result of the infant's experiences. Brain plasticity, the susceptibility of a developing organism to environmental influences, is relatively high. Researchers have identified sensitive periods during the development of body systems and behaviors—limited periods when the organism is particularly susceptible to environmental influences.
- Babies integrate their individual behaviors by developing rhythms—repetitive, cyclical patterns of behavior. A major rhythm relates to the infant's state—the awareness it displays to internal and external stimulation.
- SIDS is a disorder in which seemingly healthy infants die in their sleep.

Journal Writing Prompt

Applying Lifespan Development: What evolutionary advantage could there be for infants to be born with more nerve cells than they actually need or use?

Motor Development

Suppose a genetic engineering firm hired you to redesign newborns and charged you with replacing the current version with a new, more mobile one. The first change you'd probably consider in carrying out this (luckily fictitious) job would be in the conformation and composition of the baby's body.

The shape and proportions of newborn babies are simply not conducive to easy mobility. Their heads are so large and heavy that young infants lack the strength to raise them. Because their limbs are short in relation to the rest of the body, their movements are further impeded. Furthermore, their bodies are mainly fat, with a limited amount of muscle; the result is that they lack strength.

Fortunately, it doesn't take too long before infants begin to develop a remarkable amount of mobility. Actually, even at birth they have an extensive repertoire of behavioral possibilities brought about by innate reflexes, and their range of motor skills grows rapidly during the first two years of life.

Reflexes: Our Inborn Physical Skills

LO 4.5 Explain how the reflexes that infants are born with help them adapt to their surroundings and protect them.

When her father pressed three-day-old Christina's palm with his finger, she responded by tightly winding her small fist around his finger and grasping it. When he moved his finger upward, she held on so tightly that it seemed he might be able to lift her completely off her crib floor.

THE BASIC REFLEXES. Her father was right: Christina probably could have been lifted in this way. The reason for her resolute grip was activation of one of the dozens of reflexes with which infants are born. **Reflexes** are unlearned, organized, involuntary responses that occur automatically in the presence of certain stimuli. Newborns enter the world with a repertoire of reflexive behavioral patterns that help them adapt to their new surroundings and serve to protect them.

reflexes
unlearned, organized, involuntary responses that occur automatically in the presence of certain stimuli

As we can see from the list of reflexes in Table 4-3, many reflexes clearly represent behavior that has survival value, helping to ensure the well-being of the infant. For instance, the *swimming reflex* makes a baby who is lying face down in a body of water paddle and kick in a sort of swimming motion. The obvious consequence of such behavior is to help the baby move from danger and survive until a caregiver can come to its rescue. Similarly, the *eye-blink reflex* seems designed to protect the eye from too much direct light, which might damage the retina.

Given the protective value of many reflexes, it might seem beneficial for them to remain with us for our entire lives. In fact, some do: The eye-blink reflex remains functional throughout the full life span. But quite a few reflexes, such as the swimming reflex, disappear after a few months. Why should this be the case?

Researchers who focus on evolutionary explanations of development attribute the gradual disappearance of reflexes to the increase in voluntary control over behavior that occurs as infants become more able to control their muscles. In addition, it may be

Table 4-3 Some Basic Reflexes in Infants

Reflex	Approximate Age of Disappearance	Description	Possible Function
Rooting reflex	3 weeks	Neonate's tendency to turn its head toward things that touch its cheek.	Food intake
Stepping reflex	2 months	Movement of legs when held upright with feet touching the floor.	Prepares infants for independent locomotion
Swimming reflex	4–6 months	Infant's tendency to paddle and kick in a sort of swimming motion when lying face down in a body of water.	Avoidance of danger
Grasping reflex	5–6 months	Infant's fingers close around an object placed in its hands.	Provides support
Moro reflex	6 months	Activated when support for the neck and head is suddenly removed. The arms of the infant are thrust outward and then appear to grasp onto something.	Similar to primates' protection from falling
Babinski reflex	8–12 months	An infant fans out its toes in response to a stroke on the outside of its foot.	Unknown
Startle reflex	Remains in different form	An infant, in response to a sudden noise, flings out its arms, arches its back, and spreads its fingers.	Protection
Eye-blink reflex	Remains	Rapid shutting and opening of eye on exposure to direct light.	Protection of eye from direct light
Sucking reflex	Remains	Infant's tendency to suck at things that touch its lips.	Food intake
Gag reflex	Remains	An infant's reflex to clear its throat.	Prevents choking

that reflexes form the foundation for future, more complex behaviors. As these more intricate behaviors become well learned, they encompass the earlier reflexes (Myklebust & Gottlieb, 1993; Lipsitt, 2003).

It may be that reflexes stimulate parts of the brain responsible for more complex behaviors, helping them develop. For example, some researchers argue that exercise of the stepping reflex helps the brain's cortex develop the ability to walk. As evidence, developmental psychologist Philip R. Zelazo and his colleagues conducted a study in which they provided two-week-old infants practice in walking for four sessions of three minutes each over a six-week period. The results showed that the children who had the walking practice actually began to walk unaided several months earlier than those who had no such practice. Zelazo suggests that the training produced stimulation of the stepping reflex, which in turn led to stimulation of the brain's cortex, readying the infant earlier for independent locomotion (Zelazo, 1998; Corbetta, Friedman & Bell, 2014).

Do these findings suggest that parents should make out-of-the-ordinary efforts to stimulate their infant's reflexes? Probably not. Although the evidence shows that intensive practice may produce an earlier appearance of certain motor activities, there is no evidence that the activities are performed qualitatively any better in practiced infants than in unpracticed infants. Furthermore, even when early gains are found, they do not seem to produce an adult who is more proficient in motor skills.

In fact, structured exercise may do more harm than good. According to the American Academy of Pediatrics, structured exercise for infants may lead to muscle strain, fractured bones, and dislocated limbs, consequences that far outweigh the unproven benefits that may come from the practice (National Association for Sport and Physical Education, 2006).

(a)

(b)

(c)

Infants showing (a) the sucking and grasping reflex, (b) the startle reflex, and (c) the Moro reflex.

ETHNIC AND CULTURAL DIFFERENCES AND SIMILARITIES IN REFLEXES. Although reflexes are, by definition, genetically determined and universal throughout all infants, there are actually some cultural variations in the ways they are displayed. For instance, consider the *Moro reflex*, which is activated when support for the neck and head is suddenly removed. The Moro reflex consists of the infant's arms thrusting outward and then appearing to seek to grasp onto something. Most scientists feel that the Moro reflex represents a leftover response that we humans have inherited from our nonhuman ancestors. The Moro reflex is an extremely useful behavior for monkey babies, who travel about by clinging to their mothers' backs. If they lose their grip, they fall down unless they are able to grasp quickly onto their mother's fur—using a Moro-like reflex (Zafeiriou, 2004).

The Moro reflex is found in all humans, but it appears with significantly different vigor in different children. Some differences reflect cultural and ethnic variations (Freedman, 1979). For instance, Caucasian infants show a pronounced response to situations that produce the Moro reflex. Not only do they fling out their arms, but they also cry and respond in a generally agitated manner. In contrast, Navajo babies react to the same situation much more calmly. Their arms do not flail out as much, and they cry only rarely.

In some cases, reflexes can serve as helpful diagnostic tools for pediatricians. Because reflexes emerge and disappear on a regular timetable, their absence—or presence—at a given point of infancy can provide a clue that something may be amiss in an infant's development. (Even for adults, physicians include reflexes in their diagnostic bags of tricks, as anyone knows who has had his or her knee tapped with a rubber mallet to see if the lower leg jerks forward.)

Reflexes evolved because, at one point in humankind's history, they had survival value. For example, the sucking reflex automatically helps infants obtain nourishment, and the rooting reflex helps them search for the presence of a nipple. In addition, some reflexes also serve a social function, promoting caregiving and nurturance. For instance, Christina's father, who found his daughter gripping his finger tightly when he pressed her palm, probably cares little that she is simply responding with an innate

WATCH THIS VIDEO ON MYPSYCHLAB THE NEWBORN'S REFLEXES.

reflex. Instead, he will more likely view his daughter's action as responsiveness to him, a signal perhaps of increasing interest and affection on her part. As we will see in Chapter 6, when we discuss the social and personality development of infants, such apparent responsiveness can help cement the growing social relationship between an infant and its caregivers.

Motor Development in Infancy: Landmarks of Physical Achievement

LO 4.6 **Summarize the landmarks of motor skill development in infancy.**

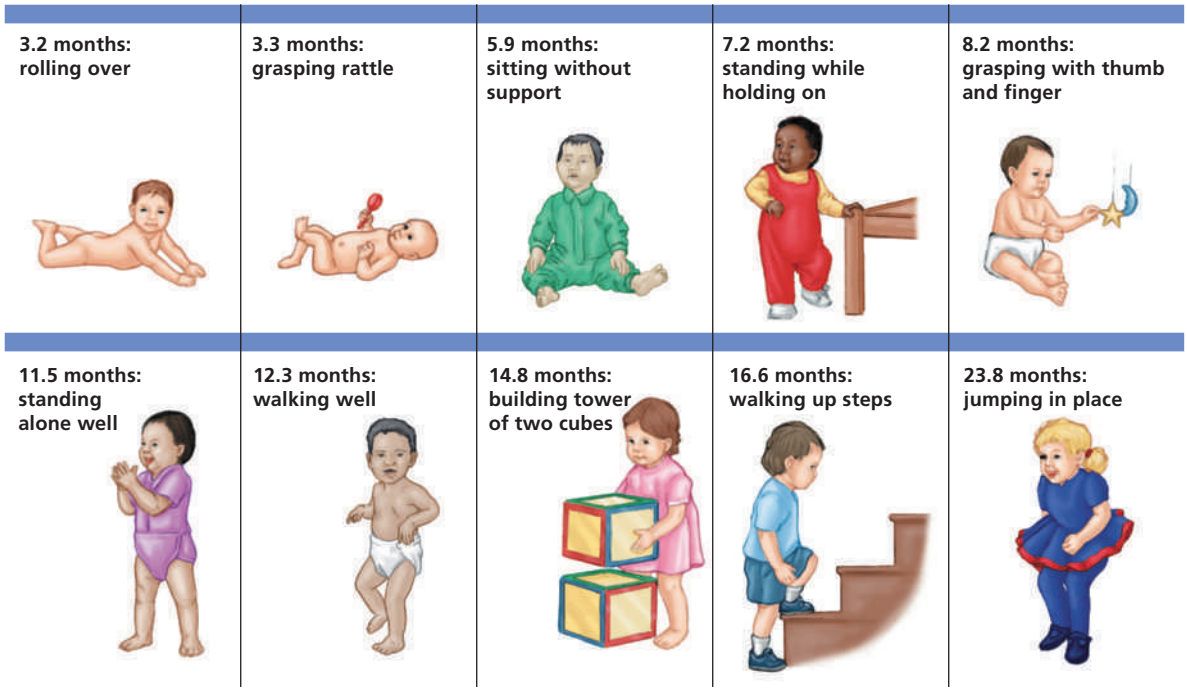
Probably no physical changes are more obvious—and more eagerly anticipated—than the increasing array of motor skills that babies acquire during infancy. Most parents can remember their child's first steps with a sense of pride and awe at how quickly she or he changed from a helpless infant, unable even to roll over, into a person who could navigate quite effectively in the world.

GROSS MOTOR SKILLS. Even though the motor skills of newborn infants are not terribly sophisticated, at least compared with attainments that will soon appear, young infants still are able to accomplish some kinds of movement. For instance, when placed on their stomachs they wiggle their arms and legs and may try to lift their heavy heads. As their strength increases, they are able to push hard enough against the surface on which they are resting to propel their bodies in different directions. They often end up moving backward rather than forward, but by the age of six months they become rather accomplished at moving themselves in particular directions. These initial efforts are the forerunners of crawling, in which babies coordinate the motions of their arms and legs and propel themselves forward. Crawling appears typically between 8 and 10 months. Figure 4-8 provides a summary of some of the milestones of normal motor development.

Figure 4-8 Milestones of Motor Development

Fifty percent of children are able to perform each skill at the month indicated in the figure. However, the specific timing at which each skill appears varies widely. For example, one-quarter of children are able to walk well at 11.1 months; by 14.9 months, 90 percent of children are walking well. Is knowledge of such average benchmarks helpful or harmful to parents?

(**Source:** Adapted from Frankenburg et al., 1992.)



Walking comes later. At around the age of nine months, most infants are able to walk by supporting themselves on furniture, and half of all infants can walk well by the end of their first year of life.

At the same time infants are learning to move around, they are perfecting the ability to remain in a stationary sitting position. At first, babies cannot remain seated upright without support. But they quickly master this ability, and most are able to sit without support by the age of six months.

This infant demonstrates his fine motor skills.

FINE MOTOR SKILLS. As infants are perfecting their gross motor skills, such as sitting upright and walking, they are also making advances in their fine motor skills. For instance, by the age of three months, infants show some ability to coordinate the movements of their limbs.

Furthermore, although infants are born with a rudimentary ability to reach toward an object, this ability is neither very sophisticated nor very accurate, and it disappears around the age of four weeks. A different, more precise form of reaching reappears at four months. It takes some time for infants to coordinate successful grasping after they reach out, but in fairly short order they are able to reach out and hold onto an object of interest (Claxton, Keen, & McCarty, 2003; Claxton, McCarty, & Keen, 2009; Foroud, & Whishaw, 2012).

The sophistication of fine motor skills continues to grow. By the age of 11 months, infants are able to pick up off the ground objects as small as marbles—something caregivers need to be concerned about, since the next place such objects often go is the mouth. By the time they are two years old, children can carefully hold a cup, bring it to their lips, and take a drink without spilling a drop.

Grasping, like other motor advances, follows a sequential developmental pattern in which simple skills are combined into more sophisticated ones. For example, infants first begin picking things up with their whole hand. As they get older, they use a *pincer grasp*, where thumb and index finger meet to form a circle. The pincer grasp allows for considerably more precise motor control (Barrett & Needham, 2008; Thoermer et al., 2013; Dionisio et al., 2015).

DYNAMIC SYSTEMS THEORY: HOW MOTOR DEVELOPMENT IS COORDINATED. Although it is easy to think about motor development in terms of a series of individual motoric achievements, the reality is that each of these skills does not develop in a vacuum. Each skill (such as a baby's ability to pick up a spoon and guide it to her lips) advances in the context of other motor abilities (such as the ability to reach out and lift the spoon in the first place). Furthermore, as motor skills are developing, so also are nonmotor skills such as visual capabilities.

Developmentalist Esther Thelen has created an innovative theory to explain how motor skills develop and are coordinated. **Dynamic systems theory** describes how motor behaviors are assembled. By "assembled," Thelen means the coordination of a variety of skills that develop in a child, ranging from the development of an infant's muscles, its perceptual abilities and nervous system, as well as its motivation to carry out particular motor activities, and support from the environment (Thelen & Bates, 2003; Gershkoff-Stowe & Thelen, 2004; Thelen & Smith, 2006).

dynamic systems theory
a theory of how motor skills develop and are coordinated

According to dynamic systems theory, motor development in a particular sphere, such as beginning to crawl, is not just dependent on the brain initiating a "crawling program" that permits the muscles to propel the baby forward. Instead, crawling requires the coordination of muscles, perception, cognition, and motivation. The theory emphasizes how children's exploratory activities, which produce new challenges as they interact with their environment, lead them to advancements in motor skills (Corbetta & Snapp-Childs, 2009).

Dynamic systems theory is noteworthy for its emphasis on a child's own motivation (a cognitive state) in advancing important aspects of motor development. For example,

infants need to be motivated to touch something out of their reach in order to develop the skills they need to crawl to it. The theory also may help explain individual differences in the emergence of motor abilities in different children, which we consider next.

DEVELOPMENTAL NORMS: COMPARING THE INDIVIDUAL TO THE GROUP. Keep in mind that the timing of the milestones in motor development that we have been discussing is based on norms. **Norms** represent the average performance of a large sample of children of a given age. They permit comparisons between a particular child's performance on a particular behavior and the average performance of the children in the norm sample.

norm
the average performance of a large sample of children of a given age

For instance, one of the most widely used techniques to determine infants' normative standing is the **Brazelton Neonatal Behavioral Assessment Scale (NBAS)**, a measure designed to determine infants' neurological and behavioral responses to their environment.

Brazelton Neonatal Behavioral Assessment Scale (NBAS)
a measure designed to determine infants' neurological and behavioral responses to their environment

The NBAS provides a supplement to the traditional Apgar test that is given immediately following birth. Taking about 30 minutes to administer, the NBAS includes 27 separate categories of responses that constitute four general aspects of infants' behavior: interactions with others (such as alertness and cuddliness), motor behavior, physiological control (such as the ability to be soothed after being upset), and responses to stress (Brazelton, 1990; Canals, Fernandez-Ballart, & Espuro, 2003; Ohta & Ohgi, 2013).

Although the norms provided by scales such as the NBAS are useful in making broad generalizations about the timing of various behaviors and skills, they must be interpreted with caution. Because norms are averages, they mask substantial individual differences in the timing of attaining various achievements. For example, some children may be ahead of the norm. Other perfectly normal children such as Evan, the child described in the prologue, may be a bit behind. Norms also may hide the fact that the sequence in which various behaviors are achieved may differ somewhat from one child to another (Boatella-Costa et al., 2007; Noble & Boyd, 2012).

Norms are useful only to the extent that they are based on data from a large, heterogeneous, culturally diverse sample of children. Unfortunately, many of the norms on which developmental researchers have traditionally relied have been based on groups of infants who are predominantly Caucasian and from the middle and upper socioeconomic strata. The reason: much of the research was conducted on college campuses, using the children of graduate students and faculty.

This limitation would not be critical if no differences existed in the timing of development in children from different cultural, racial, and social groups. But they do. For example, as a group, African American babies show more rapid motor development than Caucasian babies throughout infancy. Moreover, there are significant variations related to cultural factors, as we discuss in the Developmental Diversity and Your Life box (Gartstein, Slobodskaya, & Kinsht, 2003; de Onis et al., 2007; Wu et al., 2008).

Nutrition in Infancy: Fueling Motor Development

LO 4.7 Summarize the role of nutrition in the physical development of infants.

> *Rosa sighed as she sat down to nurse the baby—again. She had fed four-week-old Juan about every hour today, and he still seemed hungry. Some days, it seemed as if all she did was breastfeed her baby. "Well, he must be going through a growth spurt," she decided, as she settled into her favorite rocking chair and put the baby to her nipple.*

The rapid physical growth that occurs during infancy is fueled by the nutrients that infants receive. Without proper nutrition, infants cannot reach their physical potential, and they may suffer cognitive and social consequences as well (Tanner & Finn-Stevenson, 2002; Costello, Compton, & Keeler, 2003; Gregory, 2005).

Although there are vast individual differences in what constitutes appropriate nutrition—infants differ in terms of growth rates, body composition, metabolism, and

Developmental Diversity and Your Life

The Cultural Dimensions of Motor Development

***Among the Ache people**, who live in the rain forest of South America, infants face an early life of physical restriction. Because the Ache lead a nomadic existence, living in a series of tiny camps in the rain forest, open space is at a premium. Consequently, for the first few years of life, infants spend nearly all their time in direct physical contact with their mothers. Even when they are not physically touching their mothers, they are permitted to venture no more than a few feet away.*

* * *

***Infants among the Kipsigis people**, who live in a more open environment in rural Kenya, Africa, lead quite a different existence. Their lives are filled with activity and exercise. Parents seek to teach their children to sit up, stand, and walk from the earliest days of infancy. For example, very young infants are placed in shallow holes in the ground designed to keep them in an upright position. Parents begin to teach their children to walk starting at the eighth week of life. The infants are held with their feet touching the ground, and they are pushed forward.*

Clearly, the infants in these two societies lead very different lives (Super, 1976; Kaplan & Dove, 1987). But do the relative lack of early motor stimulation for Ache infants and the efforts of the Kipsigis to encourage motor development really make a difference?

The answer is both yes and no. It's yes in that Ache infants tend to show delayed motor development relative both to Kipsigis infants and to children raised in Western societies. Although their social abilities are no different, Ache children tend to begin walking at around 23 months, about a year later than the typical child in the United States. In contrast, Kipsigis children, who are encouraged in their motor development, learn to sit up and walk several weeks earlier, on average, than U.S. children.

In the long run, however, the differences between Ache, Kipsigis, and Western children disappear. By about age six, there is no evidence of differences in overall motor skills among Ache, Kipsigis, and Western children.

As we see with the Ache and Kipsigis babies, variations in the timing of motor skills seem to depend in part on parental expectations of what is the "appropriate" schedule for the emergence of specific skills. For instance, one study examined the motor skills of infants who lived in a single city in England but whose mothers had varied ethnic origins. In the research, English, Jamaican, and Indian mothers' expectations were first assessed regarding several markers of their infants' motor skills. The Jamaican mothers expected their infants to sit and walk

Cultural influences affect the rate of the development of motor skills.

significantly earlier than the English and Indian mothers, and the actual emergence of these activities was in line with their expectations. The source of the Jamaican infants' earlier mastery seemed to lie in the treatment of the children by their parents. For instance, Jamaican mothers gave their children practice in stepping quite early in infancy (Hopkins & Westra, 1989, 1990).

In sum, cultural factors help determine the time at which specific motor skills appear. Activities that are an intrinsic part of a culture are more apt to be purposely taught to infants in that culture, leading to the potential of their earlier emergence (Nugent, Lester, & Brazelton, 1989).

It is not all that surprising that children in a given culture who are expected by their parents to master a particular skill, and who are taught components of that skill from an early age, are more likely to be proficient in that skill earlier than children from other cultures with no such expectations and no such training. The larger question, however, is whether the earlier emergence of a basic motor behavior in a given culture has lasting consequences for specific motor skills and for achievements in other domains. On this issue, the jury is still out.

It is clear, however, that there are certain limitations on how early a skill can emerge. It is physically impossible for one-month-old infants to stand and walk, regardless of the encouragement and practice they may get within their culture. Parents who are eager to accelerate their infants' motor development, then, should be cautioned not to hold overly ambitious goals. They might well ask themselves whether it matters if an infant acquires a motor skill a few weeks earlier than his or her peers.

The most reasonable answer is no. Although some parents may take pride in a child who walks earlier than other babies (just as some parents may be concerned over a delay of a few weeks), in the long run, the timing of this activity will probably make no difference.

activity levels—some broad guidelines do hold. In general, infants should consume about 50 calories per day for each pound they weigh—an allotment that is twice the suggested caloric intake for adults (Dietz & Stern, 1999; Skinner et al., 2004).

Typically, though, it's not necessary to count calories for infants. Most infants regulate their caloric intake quite effectively on their own. If they are allowed to consume as much as they seem to want, and not pressured to eat more, they will do fine.

MALNUTRITION. *Malnutrition*, the condition of having an improper amount and balance of nutrients, produces several results, none good. For instance, malnutrition is more common among children living in many developing countries than among children who live in more industrialized, affluent countries. Malnourished children in these countries begin to show a slower growth rate by the age of six months. By the time they reach the age of two years, their height and weight are only 95 percent of the height and weight of children in more industrialized countries. In addition, children who have been chronically malnourished during infancy later score lower on IQ tests and tend to do less well in school. These effects may linger even after the children's diet has improved substantially (Ratanachu-Ek, 2003; Waber et al., 2014).

The problem of malnutrition is greatest in underdeveloped countries, where overall 10 percent of infants are severely malnourished (see Figure 4-9). In some countries, the problem is especially severe. For example, 25 percent of North Korean children are stunted from chronic malnutrition, and 4 percent are acutely malnourished (Chaudhary & Sharma, 2012; United Nations World Food Programme, 2013).

Problems of malnourishment are not restricted to developing countries, however. In the United States, some 16 million children—22 percent—live in poverty, which puts

Figure 4-9 Undernourished in the Population

Prevalence of undernourishment in the population (percent) in 2012–2014.

(Source: World Food Programme)

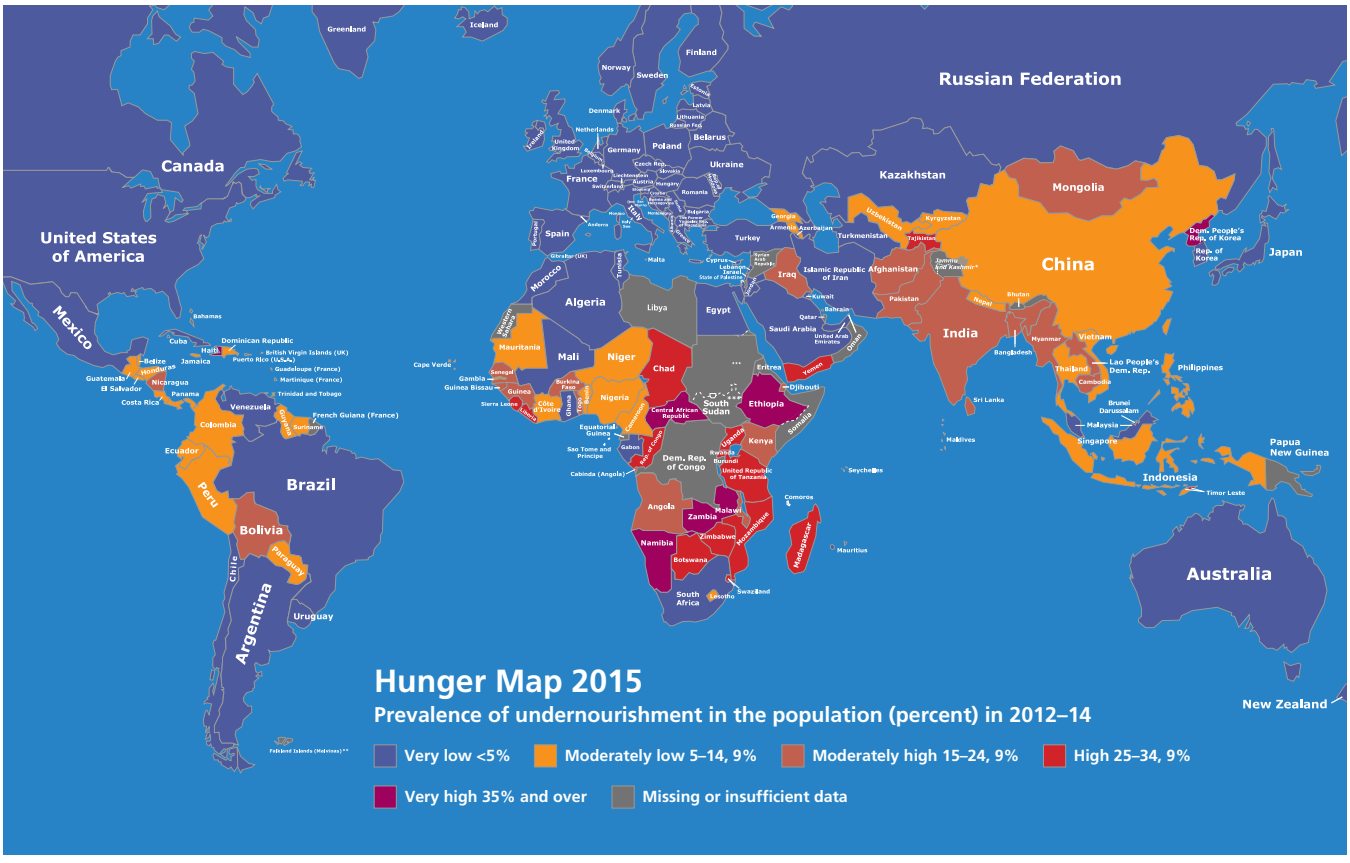
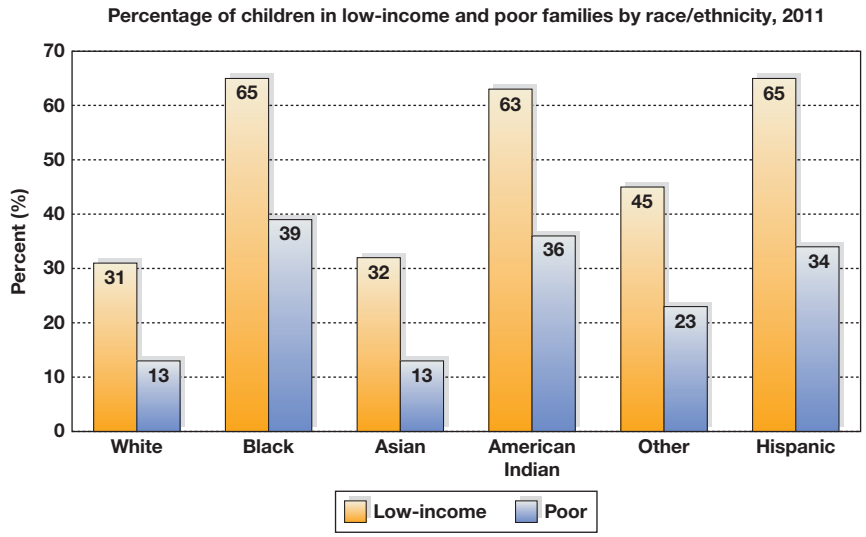


Figure 4-10 Children Living in Poverty

Members of black, American Indian, and Hispanic households are more likely to live in poverty than members of white and Asian families

(**Source:** National Center for Children in Poverty at the Joseph L. Mailman School of Public Health of Columbia University, 2013.)



them at risk for malnutrition. In fact, the proportion of children living in low-income families has risen since 2000. Overall, some 26 percent of families who have children three years old and younger live in poverty, and 49 percent are classified as low income. And, as shown in Figure 4-10, the poverty rates are even higher for Black, Hispanic, and American Indian families (National Center for Children in Poverty, 2013).

From *an educator's* perspective

Think of reasons why malnourishment, which slows physical growth, also harms IQ scores and school performance. How might malnourishment affect education in developing countries?

A variety of social service programs, such as the federal Supplemental Nutrition Assistance Program (SNAP), have been created to combat this issue. These programs mean that children rarely become severely malnourished, but such children remain susceptible to *undernutrition*, in which there is some deficiency in diet. Some surveys find that as many as a quarter of one- to five-year-old children in the United States have diets that fall below the minimum caloric intake recommended by nutritional experts. Although the consequences are not as severe as those of malnutrition, undernutrition also has long-term costs. For instance, cognitive development later in childhood is affected by even mild to moderate undernutrition (Tanner & Finn-Stevenson, 2002; Lian et al., 2012).

Severe malnutrition during infancy may lead to several disorders. Malnutrition during the first year can produce *marasmus*, a disease in which infants stop growing. Marasmus, attributable to a severe deficiency in proteins and calories, causes the body to waste away and ultimately results in death. Older children are susceptible to *kwashiorkor*, a disease in which a child's stomach, limbs, and face swell with water. To a casual observer, it appears that a child with kwashiorkor is actually chubby. However, this is an illusion: The child's body is in fact struggling to make use of the few nutrients that are available (Douglass & McGadney-Douglass, 2008).

In some cases, infants who receive sufficient nutrition act as though they have been deprived of food. Looking as though they suffer from marasmus, they are underdeveloped, listless, and apathetic. The real cause, however, is emotional: They lack sufficient love and emotional support. In such cases, known as **nonorganic failure to thrive**,

Malnourishment at an early age can lower IQ scores, even if diet improves later. How might this deficit be overcome?

nonorganic failure to thrive
a disorder in which infants stop growing due to a lack of stimulation and attention as the result of inadequate parenting

children stop growing not for biological reasons but due to a lack of stimulation and attention from their parents. Usually occurring by the age of 18 months, nonorganic failure to thrive can be reversed through intensive parent training or by placing children in a foster home where they can receive emotional support.

OBESITY. It is clear that malnourishment during infancy has potentially disastrous consequences for an infant. Less clear, however, are the effects of *obesity*, defined as weight greater than 20 percent above the average for a given height.

While there is no clear association between obesity during infancy and obesity during adolescence, some research suggests that overfeeding during infancy may lead to the creation of an excess of fat cells, which remain in the body throughout life and may predispose a person to be overweight. Weight during infancy is associated with weight at age six and adult obesity, suggesting that obesity in babies ultimately may be found to be associated with adult weight problems. A clear link between overweight babies and overweight adults, however, has not yet been found (Taveras et al., 2009; Carnell et al., 2013; Murasko, 2015).

Although the evidence linking infant obesity to adult obesity is inconclusive, it's plain that the societal view that "a fat baby is a healthy baby" is not necessarily correct. Indeed, cultural myths about food clearly lead to overfeeding. But other factors are related to obesity in infants. For example, infants delivered via Cesarean section are twice as likely to become obese as infants born vaginally (Huh et al., 2011).

Given the lack of clarity regarding infant obesity, parents should concentrate less on their baby's weight and more on providing appropriate nutrition. But just what constitutes proper nutrition? Probably the biggest question revolves around whether infants should be breastfed or given a formula of commercially processed cow's milk with vitamin additives, as we consider next.

Breast or Bottle?

LO 4.8 Summarize the benefits of breastfeeding in infancy.

Fifty years ago, if a mother asked her pediatrician whether breastfeeding or bottle-feeding was better, she would have received a simple and clear-cut answer: Bottle-feeding was the preferred method. Starting around the 1940s, the general belief among child-care experts was that breastfeeding was an obsolete method that put children unnecessarily at risk.

With bottle-feeding, the argument went, parents could keep track of the amount of milk their baby was receiving and could thereby ensure that the child was taking in sufficient nutrients. In contrast, mothers who breastfed their babies could never be certain just how much milk their infants were getting. Use of the bottle was also supposed to help mothers keep their feedings to a rigid schedule of one bottle every four hours, the recommended procedure at that time.

Today, however, a mother would get a very different answer to the same question. Child-care authorities agree: For the first 12 months of life, there is no better food for an infant than breast milk. Breast milk not only contains all the nutrients necessary for growth, but it also seems to offer some immunity to a variety of childhood diseases, such as respiratory illnesses, ear infections, diarrhea, and allergies. Breastfeeding for as little as four months reduces infections by an average of 45 percent, and the reduction in infection is 65 percent lower for six months of breastfeeding compared to formula-fed babies. Breast milk is more easily digested than cow's milk or formula, and it is convenient for the mother to dispense. There is even some evidence that breast milk may enhance cognitive growth, leading to high adult intelligence (American Academy of Pediatrics, 2005; Duijts et al., 2010; Julvez et al., 2014).

Breastfeeding also offers significant emotional advantages for both mother and child. Most mothers report that the experience of breastfeeding brings about feelings of well-being and intimacy with their infants, perhaps because of the production of endorphins

"I forgot to say I was breast-fed."

in mothers' brains. Breastfed infants are also more responsive to their mothers' touch and their mothers' gaze during feeding, and they are calmed and soothed by the experience. As we'll see in Chapter 7, this mutual responsiveness may lead to healthy social development (Gerrish & Mennella, 2000; Zanardo et al., 2001).

Breastfeeding may even be advantageous to *mothers'* health. For instance, research suggests that women who breastfeed may have lower rates of ovarian cancer and breast cancer prior to menopause. Furthermore, the hormones produced during breastfeeding help shrink the uteruses of women following birth, enabling their bodies to return more quickly to a prepregnancy state. These hormones also may inhibit ovulation, reducing (but not eliminating!) the chance of becoming pregnant, and thereby helping to space the birth of additional children (Kim et al., 2007; Pearson, Lightman, & Evans, 2011: Kornides & Kitsantas, 2013).

Breastfeeding is not a cure-all for infant nutrition and health, and the millions of individuals who have been raised on formula should not be concerned that they have suffered irreparable harm. (Recent research suggests that infants fed enriched formula show better cognitive development than those using traditional formula.) But it does continue to be clear that the popular slogan used by groups advocating the use of breastfeeding is right on target: "Breast Is Best" (Auestad et al., 2003; Rabin, 2006; Ludlow et al., 2012; also see the From Research to Practice box).

INTRODUCING SOLID FOODS: WHEN AND WHAT? Although pediatricians agree that breast milk is the ideal initial food, at some point infants require more nutriments than breast milk alone can provide. The American Academy of Pediatrics and the American Academy of Family Physicians suggest that babies can start solids at around six months, although they aren't needed until 9 to 12 months of age (American Academy of Pediatrics, 2013).

Solid foods are introduced into an infant's diet gradually, one at a time, in order to identify preferences and allergies. Most often cereal comes first, followed by strained fruits. Vegetables and other foods typically are introduced next, although the order varies significantly from one infant to another.

The timing of *weaning*, the gradual cessation of breast- or bottle-feeding, varies greatly. In developed countries such as the United States, weaning frequently occurs as early as three or four months. On the other hand, some mothers continue breastfeeding for two or three years. The American Academy of Pediatrics recommends that infants be fed breast milk for the first 12 months (American Academy of Pediatrics, 1997; Sloan et al., 2008).

Infants generally start solid foods at around four to six months, gradually working their way up to a variety of different foods.

From Research to Practice

The Science of Breast Milk

Given its importance as the primary source of nutrition for breast-fed infants, you might think that science has long been scrutinizing the components of breast milk and how it is digested and utilized by infants. That has not been the case for a surprisingly long time. It's only relatively recently that researchers are taking a close look at breast milk, and they are finding it to be surprisingly complex.

It is readily apparent to scientists that breast milk isn't just food. Its role in immunity has long been recognized, if not well understood, since breast-fed infants were long ago observed to have lower mortality rates than bottle-fed infants. Breast milk contains complex carbohydrates called oligosaccharides. Humans can't digest these, but bacteria can, pointing to the role of breast milk in nurturing the bacteria that normally thrive in the human gut and provide important protective functions. It turns out that these oligosaccharides are very specific—only one species of bacterium, called *B. longum* bv. *infantis*, has all the enzymes necessary to digest them, enabling that species to dominate by far any others inhabiting the infant gut.

Breast or bottle? Although infants receive adequate nourishment from breast- or bottle-feeding, most authorities agree "breast is best."

What makes *B. longum* bv. *infantis* so special? For one thing, it crowds out other bacteria, including potentially harmful pathogens that have a hard time taking hold because they can't digest the oligosaccharides. It also produces substances that selectively encourage other beneficial bacterial to grow (Ward et al., 2007; Gura, 2014).

Even more recently, researchers discovered that infants' stomachs are less acidic and less flush with enzymes than previously thought. Instead, their ability to digest proteins is limited to only a very few specific types—and these are all the types that are found in breast milk. In fact, the milk itself provides an inactive form of some of the enzymes that the infant needs to digest it, which then become activated in the stomach environment. In a way, then, breast milk ensures its own easy digestibility. The adage that breast milk is best applies in more ways than anyone suspected, and further research may uncover even more (Dallas et al., 2014).

Shared Writing Prompt

One major health risk to premature infants is infection of the gut by harmful bacteria, yet the introduction of B. longum bv. infantis hasn't had much success preventing this. Why do you think this might be the case?

Module 4.2 Review

- Reflexes are universal, genetically acquired physical behaviors.
- During infancy children reach a series of milestones in their physical development on a fairly consistent schedule, with some individual and cultural variations. Training and cultural expectations affect the timing of the development of motor skills.
- Nutrition strongly affects physical development. Malnutrition can slow growth, affect intellectual performance, and cause diseases such as marasmus and kwashiorkor. The victims of undernutrition also suffer negative effects.
- The advantages of breastfeeding are numerous, including nutritional, immunological, emotional, and physical benefits for the infant, and physical and emotional benefits for the mother as well.

Journal Writing Prompt

Applying Lifespan Development: What advice might you give a friend who is concerned that her infant is still not walking at 14 months, when every other baby she knows started walking by the first birthday?

The Development of the Senses

William James, one of the founding fathers of psychology, believed that the world of the infant is a "blooming, buzzing confusion" (James, 1890/1950). Was he right?

In this case, James's wisdom failed him. The newborn's sensory world does lack the clarity and stability that we can distinguish as adults, but day-by-day the world grows increasingly comprehensible as the infant's ability to sense and perceive the environment develops. In fact, as we'll see in this section, babies appear to thrive in an environment enriched by pleasing sensations.

WATCH THIS VIDEO ON MYPSYCHLAB INFANT PERCEPTION

Visual Perception: Seeing the World

LO 4.9 Describe the capabilities of infants in the realm of visual perception.

The processes that underlie infants' understanding of the world around them are sensation and perception. **Sensation** is the physical stimulation of the sense organs, and **perception** is the mental process of sorting out, interpreting, analyzing, and integrating stimuli from the sense organs and brain.

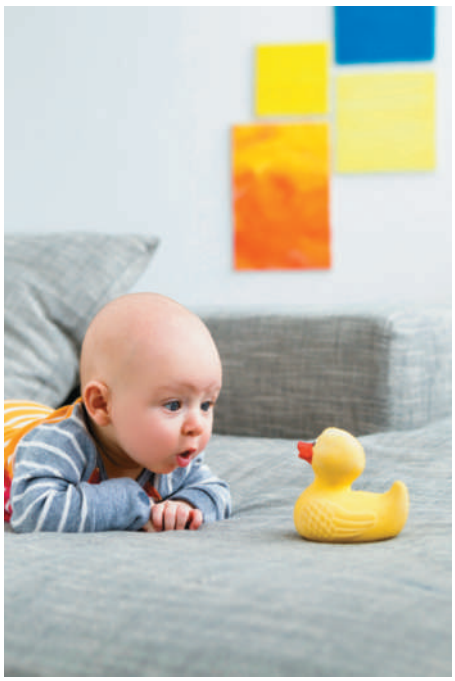
The study of infants' capabilities in the realm of sensation and perception challenges the ingenuity of investigators. And researchers have developed a number of procedures for understanding sensation and perception in different realms. Take, for instance Lee Eng, a typical infant. From the time of Lee Eng's birth, everyone who met him felt that he gazed at them intently. His eyes seemed to meet those of visitors. They seemed to bore deeply and knowingly into the faces of people who looked at him.

sensation
the physical stimulation of the sense organs

perception
the sorting out, interpretation, analysis, and integration of stimuli involving the sense organs and brain

How good, in fact, was Lee's vision, and what, precisely, could he make out of his environment? Quite a bit, at least up close. According to some estimates, a newborn's distance vision ranges from 20/200 to 20/600, which means that an infant can see with accuracy only visual material up to 20 feet that an adult with normal vision is able to see with similar accuracy from a distance of between 200 and 600 feet (Haith, 1991).

These figures indicate that infants' distance vision is one-tenth to one-third that of the average adult's. This isn't so bad, actually: The vision of newborns provides the same degree of distance acuity as the uncorrected vision of many adults who wear eyeglasses or contact lenses. (If you wear glasses or contact lenses, remove them to get a sense of what an infant can see of the world.) Furthermore, infants' distance vision grows increasingly acute. By six months of age, the average infant's vision is already 20/20—in other words, identical to that of adults (Cavallini, Fazzi, & Viviani, 2002; Corrow et al., 2012).



While an infant's vision is poorer than the average adult's, the vision of newborns provides the same degree of distance acuity as the uncorrected vision of many adults who wear eyeglasses or contact lenses.

Other visual abilities grow rapidly. For instance, *binocular vision*, the ability to combine the images coming to each eye to see depth and motion, is achieved at around 14 weeks. Before then, infants do not integrate the information from each eye.

Depth perception is a particularly useful ability, helping babies acknowledge heights and avoid falls. In a classic study by developmental psychologists Eleanor Gibson and Richard Walk (1960), infants were placed on a sheet of heavy glass. A checkered pattern appeared under one-half of the glass sheet, making it seem that the infant was on a stable floor. However, in the middle of the glass sheet, the pattern dropped down several feet, forming an apparent "visual cliff." Gibson and Walk asked this question: Would infants willingly crawl across the cliff when called by their mothers (see Figure 4-11).

The results were unambiguous. Most of the infants in the study, who ranged in age from 6 to 14 months, could not be coaxed over the apparent cliff. Clearly, the ability to perceive depth had already developed in most of them by that age. On the other hand, the experiment did not pinpoint when depth perception emerged, since only infants who had already learned to crawl could be tested. But other experiments, in which infants of two and three months were placed on their stomachs above the apparent floor and above the visual cliff, revealed differences in heart rate between the two positions (Campos, Langer, & Krowitz, 1970; Kretch & Adolph, 2013; Adolph, Kretch, & LoBue, 2014).

Figure 4-11 Visual Cliff

The "visual cliff" experiment examines the depth perception of infants. Most infants in the age range of 6 to 14 months cannot be coaxed to cross the cliff, apparently responding to the fact that the patterned area drops several feet.

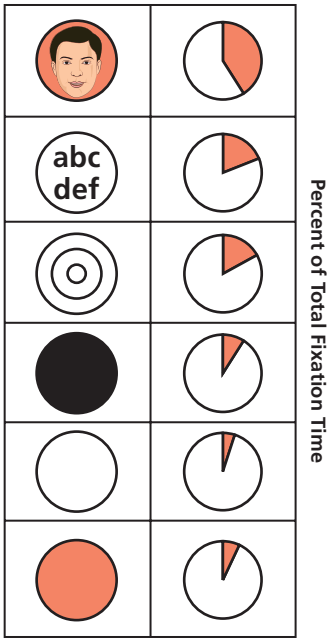
Still, it is important to keep in mind that such findings do not permit us to know whether infants are responding to depth itself or merely to the *change* in visual stimuli that occurs when they are moved from a lack of depth to depth.

Infants also show clear visual preferences, preferences that are present from birth. Given a choice, infants reliably prefer to look at stimuli that include patterns than to look at simpler stimuli (see Figure 4-12). How do we know? Developmental psychologist Robert Fantz (1963) created a classic test. He built a chamber in which babies could lie on their backs and see pairs of visual stimuli above them. Fantz could determine which of the stimuli the infants were looking at by observing the reflections of the stimuli in their eyes.

Figure 4-12 Preferring Complexity

In a classic experiment, researcher Robert Fantz found that two- and three-month-old infants preferred to look at more complex stimuli than simple ones.

(**Source:** Adapted from Fantz, 1961.)



Fantz's work was the impetus for a great deal of research on the preferences of infants, most of which points to a critical conclusion: Infants are genetically preprogrammed to prefer particular kinds of stimuli. For instance, just minutes after birth, they show preferences for certain colors, shapes, and configurations of various stimuli. They prefer curved over straight lines, three-dimensional figures to two-dimensional ones, and human faces to nonfaces. Such capabilities may reflect the existence of highly specialized cells in the brain that react to stimuli of a particular pattern, orientation, shape, and direction of movement (Hubel & Wiesel, 2004; Kellman & Arterberry, 2006; Gliga et al., 2009).

Genetics is not the sole determinant of infant visual preferences. Just a few hours after birth, infants have already learned to prefer their own mother's face to other faces. Similarly, between the ages of six and nine months, infants become more adept at distinguishing between the faces of humans, while they become less able to distinguish faces of members of other species (see Figure 4-13). They also distinguish between male and female faces. Such findings provide another clear piece of evidence of how heredity and environmental experiences are woven together to determine an infant's capabilities (Ramsey-Rennels & Langlois, 2006; Valenti, 2006; Quinn et al., 2008; Otsuka et al., 2012).

Auditory Perception: The World of Sound

LO 4.10 Describe the capabilities of infants in the realm of auditory sensation and perception.

What is it about a mother's lullaby that helps soothe a crying, fussy baby? Some clues emerge when we look at the capabilities of infants in the realm of auditory sensation and perception.

Infants hear from the time of birth—and even before. As noted in Chapter 2, the ability to hear begins prenatally. Even in the womb, the fetus responds to sounds outside of its mother. Furthermore, infants are born with preferences for particular sound combinations (Trehub, 2003; Pundir et al., 2012).

Because they have had some practice in hearing before birth, it is not surprising that infants have reasonably good auditory perception after they are born. Infants actually are more sensitive to certain very high and very low frequencies than adults—a sensitivity that seems to increase during the first two years of life. On the other hand, infants are initially less sensitive than adults to middle-range frequencies. Eventually, however, their capabilities within the middle range improve (Fernald, 2001; Lee & Kisilevsky, 2014).

It is not fully clear what, during infancy, leads to the improvement in sensitivity to midfrequency sounds, although it may be related to the maturation of the nervous system. More puzzling is why, after infancy, children's ability to hear very high and low frequencies gradually declines. One explanation may be that exposure to high levels of noise may diminish capacities at the extreme ranges (Trehub et al., 1989; Stewart, Scherer, & Lehman, 2003).

In addition to the ability to detect sound, infants need several other abilities in order to hear effectively. For instance, *sound localization* permits us to pinpoint the direction from which a sound is emanating. Compared to adults, infants have a slight handicap in this task because effective sound localization requires use of the slight difference in the times at which a sound reaches our two ears. Sound that we hear first in the right ear tells us that the source of the sound is to our right. Because infants' heads are smaller than those of adults, the difference in timing of the arrival of sound at the two ears is less than it is in adults, so they have difficulty determining from which direction sound is coming.

Despite the potential limitation caused by their smaller heads, infants' sound localization abilities are fairly good even at birth, and they reach adult levels of success by the age of one year. Interestingly, their improvement is not steady: Although we don't know why, studies show that the accuracy of sound localization declines between birth and two months of age, but then begins to increase (Clifton, 1992; Litovsky & Ashmead, 1997; Fenwick & Morrongiello, 1998).

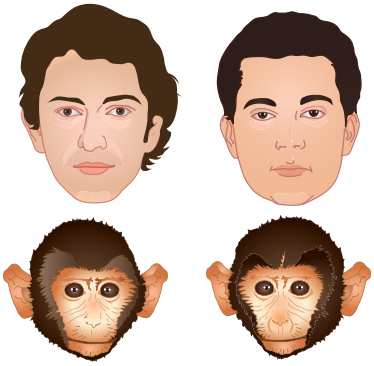
Infants can discriminate groups of different sounds, in terms of their patterns and other acoustical characteristics, quite well. For instance, infants as young as six months old can detect the change of a single note in a six-tone melody. They also react to changes in musical key and rhythm. In sum, they listen with a keen ear to the melodies of lullabies their mothers and fathers sing to them (Phillips-Silver & Trainor, 2005; Masataka, 2006; Trehub & Hannon, 2009).

Even more important to their ultimate success in the world, young infants are capable of making the fine discriminations that their future understanding of language will require (Bijeljac-Babic, Bertoncini, & Mehler, 1993; Gervain et al., 2008). For instance, in one classic study, a group of one- to four-month-old infants sucked on nipples that activated a recording of a person saying "ba" every time they sucked (Eimas et al., 1971). At first, their interest in the sound made them suck vigorously. Soon, though, they became acclimated to the sound (through a process called *habituation*, discussed in Chapter 3) and sucked with less energy. On the other hand, when the experimenters changed the sound to "pa," the infants immediately showed new interest and sucked with greater vigor once again. The clear conclusion: Infants as young as one month old could make the distinction between the two similar sounds (Miller & Eimas, 1995).

Figure 4-13 Distinguishing Faces

Examples of faces used in a study found that six-month-old infants distinguished human or monkey faces equally well, whereas nine-month-olds were less adept at distinguishing monkey faces as compared to human faces.

(**Source:** Pascalis, de Haan, & Nelson, 2002, p. 1322.)



By the age of four months infants are able to discriminate their own names from other, similar sounding, words. What are some ways an infant is able to discriminate his or her name from other words?

Even more intriguing, young infants are able to discriminate one language from another. By the age of 4½ months, infants are able to discriminate their own names from other, similar-sounding words. By the age of five months, they can distinguish the difference between English and Spanish passages, even when the two are similar in meter, number of syllables, and speed of recitation. Some evidence suggests that even two-day-olds show preferences for the language spoken by those around them over other languages (Rivera-Gaziola, Silva-Pereyra, & Kuhl, 2005; Kuhl, 2006; Palmer et al., 2012; Chonchaiya et al., 2013).

Given their ability to discriminate a difference in speech as slight as the difference between two consonants, it is not surprising that infants can distinguish different people on the basis of voice. From an early age they show clear preferences for some voices over others. For instance, in one experiment newborns were allowed to suck a nipple that turned on a recording of a human voice reading a story. The infants sucked significantly longer when the voice was that of their mother than when the voice was that of a stranger (DeCasper & Fifer, 1980; Fifer, 1987).

How do such preferences arise? One hypothesis is that prenatal exposure to the mother's voice is the key. As support for this conjecture, researchers point to the fact that newborns do not show a preference for their fathers' voices over other male voices. Furthermore, newborns prefer listening to melodies sung by their mothers before they were born to melodies that were not sung before birth. It seems, then, that the prenatal exposure to their mothers' voices—although muffled by the liquid environment of the womb—helps shape infants' listening preferences (DeCasper & Prescott, 1984; Vouloumanos & Werker, 2007; Kisilevsky et al., 2009; Jardri et al., 2012).

Smell and Taste

LO 4.11 Describe the smell and taste capacities of infants.

What do infants do when they smell a rotten egg? Pretty much what adults do—crinkle their noses and generally look unhappy. On the other hand, the scents of bananas and butter both produce a pleasant reaction on the part of infants (Steiner, 1979; Pomares, Schirrer, & Abadie, 2002).

Infants' sense of smell is so well developed they can distinguish their mothers on the basis of smell alone.

The sense of smell is so well developed, even among very young infants, that at least some 12- to 18-day-old babies can distinguish their mothers on the basis of smell alone. For instance, in one experiment, infants were exposed to the smell of gauze pads worn under the arms of adults the previous evening. Infants who were being breastfed were able to distinguish their mothers' scent from those of other adults. However, not all infants could do this: Those who were being bottle-fed were unable to make the distinction. Moreover, both breastfed and bottle-fed infants were unable to distinguish their fathers on the basis of odor (Mizuno & Ueda, 2004; Allam, Marlier, & Schaal, 2006; Lipsitt & Rovee-Collier, 2012).

Infants seem to have an innate sweet tooth (even before they have teeth!), and they show facial expressions of disgust when they taste something bitter. Very young infants smile when a sweet-tasting liquid is placed on their tongues. They also suck harder at a bottle if it is sweetened. Since breast milk has a sweet taste, it is possible that this preference may be part of our evolutionary heritage, retained because it offered a survival advantage. Infants who preferred sweet tastes may have been more likely to ingest sufficient nutrients and to survive than those who did not (Steiner, 1979; Rosenstein & Oster, 1988; Porges, Lipsitt, & Lewis, 1993).

Infants also develop taste preferences based on what their mothers drank while they were in the womb. For instance, one study found that women who drank carrot juice while pregnant had children who had a preference for the taste of carrots during infancy (Mennella, 2000).

Sensitivity to Pain and Touch

LO 4.12 Describe the nature of pain and touch in infants.

When Eli Rosenblatt was eight days old, he participated in the ancient Jewish ritual of circumcision. As he lay nestled in his father's arms, the foreskin of his penis was removed. Although Eli shrieked in what seemed to his anxious parents as pain, he soon settled down and went back to sleep. Others who had watched the ceremony assured his parents that at Eli's age, babies don't really experience pain, at least not in the same way that adults do.

Were Eli's relatives accurate in saying that young infants don't experience pain? In the past, many medical practitioners would have agreed. Because they assumed that infants didn't experience pain in truly bothersome ways, many physicians routinely carried out medical procedures, and even some forms of surgery, without the use of painkillers or anesthesia. Their argument was that the risks from the use of anesthesia outweighed the potential pain that the young infants experienced.

CONTEMPORARY VIEWS ON INFANT PAIN. Today, however, it is widely acknowledged that infants are born with the capacity to experience pain. Obviously, no one can be sure if the experience of pain in children is identical to that in adults, any more than we can tell if an adult friend who complains of a headache is experiencing pain that is more or less severe than our own pain when we have a headache. What we do know is that pain produces distress in infants. Their heartbeat increases, they sweat, show facial expressions of discomfort, and change the intensity and tone of crying when they are hurt (Kohut & Pillai Riddell, 2008; Rodkey & Riddell, 2013; Pölkki et al., 2015).

There appears to be a developmental progression in reactions to pain. For example, a newborn infant who has her heel pricked for a blood test responds with distress, but it takes her several seconds to show the response. In contrast, only a few months later, the same procedure brings a much more immediate response. It is possible that the delayed reaction in infants is produced by the relatively slower transmission of information within the newborn's less-developed nervous system (Anand & Hickey, 1992; Axia, Bonichini, & Benini, 1995; Puchalski & Hummel, 2002).

Research with rats suggests that exposure to pain in infancy may lead to a permanent rewiring of the nervous system, resulting in greater sensitivity to pain during adulthood. Such findings indicate that infants who must undergo extensive, painful medical treatments and tests may be unusually sensitive to pain when older (Ruda et al., 2000; Taddio et al., 2002; Ozawa et al., 2011).

In response to increasing support for the notion that infants experience pain and that its effects may be long-lasting, medical experts now endorse the use of anesthesia and painkillers during surgery for even the youngest infants. According to the American Academy of Pediatrics, painkilling drugs are appropriate in most types of surgery—including circumcision (Sato et al., 2007; Urso, 2007; Yamada et al., 2008; Lago, Allegro, & Heun, 2014).

RESPONDING TO TOUCH. It clearly does not take the sting of pain to get an infant's attention. Even the youngest infants respond to gentle touches, such as a soothing caress, which can calm a crying, fussy infant (Hertenstein & Campos, 2001; Hertenstein, 2002; Gitto et al., 2012).

Touch is one of the most highly developed sensory systems in a newborn, and it is also one of the first to develop; there is evidence that by 32 weeks after conception, the entire body is sensitive to touch. Furthermore, several of the basic reflexes present at birth, such as the rooting reflex, require touch sensitivity to operate: An infant must sense a touch near the mouth in order to seek automatically a nipple to suck (Haith, 1986; Field, 2014).

Touch is one of the most highly developed sensory systems in a newborn.

Infants' abilities in the realm of touch are particularly helpful in their efforts to explore the world. Several theorists have suggested that one of the ways children gain information about the world is through touching. As mentioned earlier, at the age of six months, infants are apt to place almost any object in their mouths, apparently taking in data about its configuration from their sensory responses to the feel of it in their mouths (Ruff, 1989).

In addition, as we first discussed in Chapter 3, touch plays an important role in an organism's future development, for it triggers a complex chemical reaction that assists infants in their efforts to survive. For example, gentle massage stimulates the production of certain chemicals in an infant's brain that instigate growth. Touch is also associated with social development. In fact, the brain seems primed to respond positively to slow, gentle touch (Diego, Field, & Hernandez-Reif, 2008; 2009; Gordon, 2013; Ludwig & Field, 2014).

Multimodal Perception: Combining Individual Sensory Inputs

LO 4.13 Summarize the multimodal approach to perception.

> *When Eric Pettigrew was seven months old, his grandparents presented him with a squeaky rubber doll. As soon as he saw it, he reached out for it, grasped it in his hand, and listened as it squeaked. He seemed delighted with the gift.*

One way of considering Eric's sensory reaction to the doll is to focus on each of the senses individually: what the doll looked like to Eric, how it felt in his hand, and what it sounded like. It is this approach that has dominated the study of sensation and perception in infancy.

Let's consider another approach, however: We might examine how the various sensory responses are integrated with one another. Instead of looking at each individual sensory response, we could consider how the responses work together and are combined to produce Eric's ultimate reaction. The **multimodal approach to perception** considers how information that is collected by various individual sensory systems is integrated and coordinated (Farzin, Charles, & Rivera, 2009).

multimodal approach to perception
the approach that considers how information that is collected by various individual sensory systems is integrated and coordinated

From *a health-care worker's* perspective

Persons who are born without the use of one sense often develop unusual abilities in one or more other senses. What can health-care professionals do to help infants who are lacking in a particular sense?

Although the multimodal approach is a relatively recent innovation in the study of how infants understand their sensory world, it raises some fundamental issues about the development of sensation and perception. For instance, some researchers argue that sensations are initially integrated with one another in the infant, while others maintain that the infant's sensory systems are at first separate and that brain development leads to increasing integration (Lickliter & Bahrick, 2000; Lewkowicz, 2002; Flom & Bahrick, 2007).

We do not know yet which view is correct. However, it does appear that by an early age infants are able to relate what they have learned about an object through one sensory channel to what they have learned about it through another. For instance, even one-month-old infants are able to recognize by sight objects that they have previously held in their mouths but never seen (Steri & Spelke, 1988). Clearly, some cross-talk between various sensory channels is already possible a month after birth.

Infants' multimodal perception abilities showcase the sophisticated perceptual abilities of infants, which continue to grow throughout the period of infancy. Such perceptual growth is aided by infants' discovery of **affordances**, the options that a given situation or stimulus provides. For example, infants learn that they might potentially fall when walking down a steep ramp—that is, the ramp *affords* the possibility of falling. Such

affordances
options that a given situation or stimulus provides

knowledge is crucial as infants make the transition from crawling to walking. Similarly, infants learn that an object shaped in a certain way can slip out of their hands if not grasped correctly. For example, Eric is learning that his toy has several affordances: He can grab it and squeeze it, listen to it squeak, and even chew comfortably on it if he is teething (Wilcox et al., 2007; Huang, 2012; Rocha et al., 2013; also see the "Are You an Informed Consumer of Development" section).

Are You an Informed Consumer of Development?

Exercising Your Infant's Body and Senses

Recall how cultural expectations and environments affect the age at which various physical milestones, such as the first step, occur. While most experts feel attempts to accelerate physical and sensory-perceptual development yield little advantage, parents should ensure that their infants receive sufficient physical and sensory stimulation. There are several specific ways to accomplish this goal:

- **Carry a baby in different positions** in a backpack, in a frontpack, or in a football hold with the infant's head in the palm of your hand and its feet lying on your arm. This lets the infant view the world from several perspectives.
- **Let infants explore their environment.** Don't contain them too long in a barren environment. Let them crawl or wander around—after first making the environment "childproof" by removing dangerous objects.
- **Engage in "rough-and-tumble" play that is not violent.** Wrestling, dancing, and rolling around on the floor are activities that are fun and that stimulate older infants' motor and sensory systems.
- **Let babies touch their food and even play with it.** Infancy is too early to start teaching table manners.
- **Provide toys that stimulate the senses,** particularly toys that can stimulate more than one sense at a time. For example, brightly colored, textured toys with movable parts are enjoyable and help sharpen infants' senses.

Module 4.3 Review

- Infants' sensory abilities are surprisingly well developed at or shortly after birth. Their perceptions help them explore and begin to make sense of the world. Very early, infants can see depth and motion, distinguish colors and patterns, and show clear visual preferences.
- Infants hear from the time of birth—and even before. At a very young age, infants are able to localize and discriminate sounds, and recognize the sound of their mothers.
- The scent of smell is very well developed in infants, many of whom can distinguish their mothers on the basis of smell alone. Infants have innate taste preferences, preferring sweet tastes and showing disgust when they taste something bitter.
- Infants are sensitive to pain and touch, and most medical authorities now subscribe to procedures, including anesthesia, that minimize infants' pain.
- Infants also have a keen ability to integrate information from more than one sense.

Journal Writing Prompt

Applying Lifespan Development: What might be the advantages and disadvantages of swaddling, a practice in which a baby is snuggly wrapped in a blanket and that usually calms an infant?

Epilogue

In this chapter, we discussed the nature and pace of infants' physical growth and the pace of less obvious growth in the brain and nervous system and in the regularity of infants' patterns and states.

We next looked at motor development, the development and uses of reflexes, the role of environmental influences on the pace and shape of motor development, and the importance of nutrition.

We closed the chapter with a look at the senses and the infant's ability to combine data from multiple sensory sources.

Turn back for a moment to the prologue of this chapter, which describes Evan Kaufman's unsettled sleeping and eating patterns, and answer these questions.

1. Evan's parents are wondering if he will ever sleep through the night. What could you tell them about the development of rhythms in infancy to reassure them their son will eventually adopt more conventional behavior?
2. Evan's mother mentions that she's running out of ways to entertain her son because he's awake all day long. Do you think that Evan's wakefulness could be caused, in part, by too much stimulation in his environment? What advice could you give his mother that might help both her and Evan to relax?
3. Evan's father often feeds him from a bottle at night so that his wife can rest. Why is it advantageous for Evan that the bottle contains his mother's expressed milk rather than formula?
4. Based on the information in the prologue, if Evan were shown a series of photographs of women and men, do you think he would show a preference for one over the other? Explain your thinking.

Looking Back

LO 4.1 Describe how the human body develops in the first two years of life, including the four principles that govern its growth.

Human babies grow rapidly in height and weight, especially during the first two years of life. Major principles that govern human growth include the cephalocaudal principle, the proximodistal principle, the principle of hierarchical integration, and the principle of the independence of systems.

LO 4.2 Describe how the nervous system and brain develop in the first two years of life and how the environment affects such development.

The nervous system contains a huge number of neurons, more than will be needed as an adult. "Extra" connections and neurons that are not used are eliminated as an infant develops. Brain development, largely predetermined genetically, also contains a strong element of plasticity—a susceptibility to environmental influences. Many aspects of development occur during sensitive periods when the organism is particularly susceptible to environmental influences.

LO 4.3 Explain the body rhythms and states that govern an infant's behavior the first two years of life.

One of the primary tasks of the infant is the development of rhythms—cyclical patterns that integrate individual behaviors. An important rhythm pertains to the infant's state—the degree of awareness of stimulation it displays.

LO 4.4 Describe sudden infant death syndrome (SIDS) and guidelines to prevent it.

Sudden infant death syndrome (SIDS) is a disorder in which seemingly healthy infants die in their sleep. The American Academy of Pediatrics now suggests that babies sleep on their backs rather than on their sides or stomachs to help prevent SIDS.

LO 4.5 Explain how the reflexes that infants are born with help them adapt to their surroundings and protect them.

Reflexes are unlearned, automatic responses to stimuli that help newborns survive and protect themselves. Some reflexes also have value as the foundation for future, more conscious behaviors.

LO 4.6 Summarize the landmarks of motor skill development in infancy.

The development of gross and fine motor skills proceeds along a generally consistent timetable in normal children, with substantial individual and cultural variations.

LO 4.7 Summarize the role of nutrition in the physical development of infants.

Adequate nutrition is essential for physical development. Malnutrition and undernutrition affect physical aspects of growth and may also affect IQ and school performance.

LO 4.8 Summarize the benefits of breastfeeding in infancy.

Breastfeeding has distinct advantages over bottle-feeding, including the nutritional completeness of breast milk, its provision of a degree of immunity to certain childhood diseases, and its easy digestibility. In addition, breastfeeding offers significant physical and emotional benefits to both child and mother.

LO 4.9 Describe the capabilities of infants in the realm of visual perception.

Sensation, the stimulation of the sense organs, differs from perception, the interpretation and integration of sensed stimuli. Very early, infants can see depth and motion, distinguish colors and patterns, and show clear visual preferences.

LO 4.10 Describe the capabilities of infants in the realm of auditory sensation and perception.

Infants hear from the time of birth—and even before. At a very young age, infants are able to localize and discriminate sounds, and recognize the sound of their mothers.

LO 4.11 Describe the smell and taste capacities of infants.

The scent of smell is very well developed in infants, many of whom can distinguish their mothers on the basis of smell alone. Infants have innate taste preferences, preferring sweet tastes and showing disgust when they taste something bitter.

LO 4.12 Describe the nature of pain and touch in infants.

While at one point it was assumed that young infants do not experience pain, it is widely acknowledged today that they are born with the capacity to experience pain. One of the most highly developed sensory systems in infants, which is only now being understood, touch plays an important role in the child's future development.

LO 4.13 Summarize the multimodal approach to perception.

The multimodal approach to perception considers how information that is collected by various individual sensory systems is integrated and coordinated.

Key Terms and Concepts

cephalocaudal principle 137
proximodistal principle 137
principle of hierarchical integration 137
principle of the independence of systems 137
neuron 137
synapse 137
synaptic pruning 139
myelin 139
cerebral cortex 139
plasticity 140
sensitive period 140
rhythms 141
state 141
rapid eye movement (REM) sleep 143
sudden infant death syndrome (SIDS) 144
reflexes 146
dynamic systems theory 149
norm 150
Brazelton Neonatal Behavioral Assessment Scale (NBAS) 150
nonorganic failure to thrive 153
sensation 157
perception 157
multimodal approach to perception 162
affordances 162

Chapter 5

Cognitive Development in Infancy

Learning Objectives

LO 5.1 Summarize the fundamental features of Piaget's theory of cognitive development.

LO 5.2 Describe Piaget's sensorimotor stage of cognitive development.

LO 5.3 Summarize the arguments both in support of and critical of Piaget's theory of cognitive development.

LO 5.4 Describe how infants process information according to information processing approaches to cognitive development.

LO 5.5 Describe the memory capabilities of infants their first two years of life.

LO 5.6 Describe how infant intelligence is measured using information processing approaches.

LO 5.7 Outline the processes by which children learn to use language.

LO 5.8 Outline the major theories of language development.

LO 5.9 Describe how children influence adults' language.

Chapter Overview

Prologue: Making Things Happen

Nine-month-old Raisa Novak has just begun to crawl. "I've had to baby-proof everything," her mother Bela says. One of the first things Raisa discovered as she began moving about the living room was the radio/CD player. At first, she pushed all the buttons in random order. But after just one week, she knows the red button makes the radio come on. "She has always loved music," Bela says. "She is clearly thrilled that she can make it happen whenever she wants." Raisa now crawls around the house looking for buttons to push, and cries when she gets to the dishwasher or the DVD player for the television because she can't reach their buttons—yet. "I will really have my hands full when she begins to walk," Bela says. ■

Looking Ahead

How much of the world do infants understand? How do they begin to make meaning of it all? Does intellectual stimulation accelerate an infant's cognitive development? We address these and related questions in this chapter as we consider cognitive development during the first years of life. Our examination focuses on the work of developmental researchers who seek to understand how infants develop their knowledge and understanding of the world. We first discuss the work of Swiss psychologist Jean Piaget, whose theory of developmental stages served as a highly influential impetus for a considerable amount of work on cognitive development. We look at both the limitations and the contributions of this important developmental specialist.

We then cover more contemporary views of cognitive development, examining information processing approaches that seek to explain how cognitive growth occurs. After considering how learning takes place, we examine memory in infants and the ways in which infants process, store, and retrieve information. We discuss the controversial issue of the recollection of events that occurred during infancy. We also address individual differences in intelligence.

Finally, we consider language, the cognitive skill that permits infants to communicate with others. We look at the roots of language in prelinguistic speech and trace the milestones indicating the development of language skills in the progression from baby's first words to phrases and sentences. We also look at the characteristics of adults' communication addressed to infants, characteristics that are surprisingly similar across different cultures.

By interacting with their children, parents influence cognitive development during infancy.

Piaget's Approach to Cognitive Development

Olivia's dad is wiping up the mess around the base of her high chair—for the third time today! It seems to him that 14-month-old Olivia takes great delight in dropping food from the high chair. She also drops toys, spoons, anything it seems, just to watch how it hits the floor. She almost appears to be experimenting to see what kind of noise or what size of splatter is created by each different thing she drops.

Swiss psychologist Jean Piaget (1896–1980) probably would have said that Olivia's dad is right in theorizing that Olivia is conducting her own series of experiments to learn more about the workings of her world. Piaget's views of the ways infants learn could be summed in a simple equation: *Action = Knowledge*.

Piaget argued that infants do not acquire knowledge from facts communicated by others, nor through sensation and perception. Instead, Piaget suggested that knowledge is the product of direct motor behavior. Although many of his basic explanations and propositions have been challenged by subsequent research, as we'll discuss later, the view that in significant ways infants learn by doing remains unquestioned (Piaget, 1952, 1962, 1983; Bullinger, 1997).

Swiss psychologist Jean Piaget

Key Elements of Piaget's Theory

LO 5.1 **Summarize the fundamental features of Piaget's theory of cognitive development.**

As first noted in Chapter 1, Piaget's theory is based on a stage approach to development. He assumed that all children pass through a series of four universal stages in a fixed order from birth through adolescence: sensorimotor, preoperational, concrete operational, and formal operational. He also suggested that movement from one stage to the next occurs when a child reaches an appropriate level of physical maturation *and* is exposed to relevant experiences. Without such experiences, children are assumed to be incapable of reaching their cognitive potential. Some approaches to cognition focus on changes in the *content* of children's knowledge about the world, but Piaget argued that it was critical to also consider the changes in the *quality* of children's knowledge and understanding as they move from one stage to another.

For instance, as they develop cognitively, infants experience changes in their understanding about what can and cannot occur in the world. Consider a baby who participates in an experiment during which she is exposed to three identical versions of her mother all at the same time, thanks to some well-placed mirrors. A three-month-old infant will interact happily with each of these images of mother. However, by five months, the child becomes quite agitated at the sight of multiple mothers. Apparently, by this time the child has figured out that she has but one mother, and viewing three at a time is thoroughly alarming (Bower, 1977). To Piaget, such reactions suggest that a baby is beginning to master principles regarding the way the world operates, indicating that she has begun to construct a mental sense of the world that she didn't have two months earlier.

schemes
organized patterns of functioning that adapt and change with mental development

Piaget believed that the basic building blocks of the way we understand the world are mental structures called **schemes**—organized patterns of functioning that adapt and change with mental development. At first, schemes are related to physical, or sensorimotor, activity, such as picking up or reaching for toys. As children develop, their schemes move to a mental level, reflecting thought. Schemes are similar to computer software: They direct and determine how data from the world, such as new events

or objects, are considered and dealt with (Achenbach, 1992; Rakison & Oakes, 2003; Rakison & Krogh, 2012).

If you give a baby a new cloth book, for example, he or she will touch it, mouth it, and perhaps try to tear it or bang it on the floor. To Piaget, each of these actions may represent a scheme, and they are the infant's way of gaining knowledge and understanding of this new object. Adults, however, would use a different scheme upon encountering the book. Rather than picking it up and putting it in their mouths or banging it on the floor, they would probably be drawn to the letters on the page, seeking to understand the book through the meaning of the printed words—a very different approach.

Piaget suggested that two principles underlie the growth in children's schemes: assimilation and accommodation. **Assimilation** is the process by which people understand an experience in terms of their current stage of cognitive development and way of thinking. Assimilation occurs, then, when a stimulus or an event is acted upon, perceived, and understood in accordance with existing patterns of thought. For example, an infant who tries to suck on any toy in the same way is assimilating the objects to her existing sucking scheme. Similarly, a child who encounters a flying squirrel at a zoo and calls it a "bird" is assimilating the squirrel to his existing scheme of bird.

In contrast, when we change our existing ways of thinking, understanding, or behaving in response to encounters with new stimuli or events, **accommodation** takes place. For instance, when a child sees a flying squirrel and calls it "a bird with a tail," he is beginning to *accommodate* new knowledge, modifying his scheme of bird.

Piaget believed that the earliest schemes are primarily limited to the reflexes with which we are all born, such as sucking and rooting. Infants start to modify these simple early schemes almost immediately, through the processes of assimilation and accommodation, in response to their exploration of the environment. Schemes quickly become more sophisticated as infants become more advanced in their motor capabilities—to Piaget, a signal of the potential for more advanced cognitive development. Because Piaget's sensorimotor stage of development begins at birth and continues until the child is about two years old, we consider that stage here in detail. (In future chapters, we'll discuss development during the later stages.)

According to Piaget, a baby will use a sensorimotor *scheme*, such as mouthing or banging, to understand a new object.

assimilation
the process by which people understand an experience in terms of their current stage of cognitive development and way of thinking

accommodation
changes in existing ways of thinking that occur in response to encounters with new stimuli or events

The Sensorimotor Period: The Earliest Stage of Cognitive Growth

LO 5.2 Describe Piaget's sensorimotor stage of cognitive development.

Piaget suggests that the **sensorimotor stage**, the initial major stage of cognitive development, can be divided into six substages. These are summarized in Table 5-1. It is important to keep in mind that although the specific substages of the sensorimotor period may at first appear to unfold with great regularity, as though infants reach a particular age and smoothly proceed into the next substage, the reality of cognitive development is somewhat different. First, the ages at which infants actually reach a particular stage vary a good deal among different children. The exact timing of a stage reflects an interaction between the infant's level of physical maturation and the nature of the social environment in which the child is being raised. Consequently, although Piaget contended that the order of the substages does not change from one child to the next, he admitted that the timing can and does vary to some degree.

sensorimotor stage (of cognitive development)
Piaget's initial major stage of cognitive development, which can be broken down into six substages

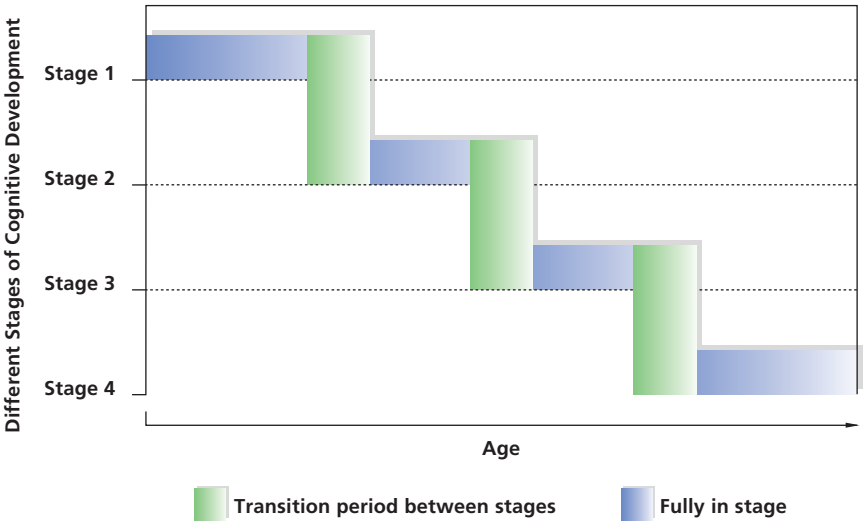
Piaget viewed development as a more gradual process than the notion of different stages might seem to imply. Infants do not go to sleep one night in one substage and wake up the next morning in the next one. Instead, there is a rather gradual and steady shifting of behavior as a child moves toward the next stage of cognitive development. Infants also pass through periods of transition, in which some aspects of their behavior reflect the next higher stage, while other aspects indicate their current stage (see Figure 5-1).

Table 5-1 Piaget's Six Substages of the Sensorimotor Stage

Substage	Age	Description	Example
Substage 1: Simple reflexes	First month of life	During this period, the various reflexes that determine the infant's interactions with the world are at the center of its cognitive life.	The sucking reflex causes the infant to suck at anything placed in its lips.
Substage 2: First habits and primary circular reactions	From 1 to 4 months	At this age, infants begin to coordinate what were separate actions into single, integrated activities.	An infant might combine grasping an object with sucking on it, or staring at something with touching it.
Substage 3: Secondary circular reactions	From 4 to 8 months	During this period, infants take major strides in shifting their cognitive horizons beyond themselves and begin to act on the outside world.	A child who repeatedly picks up a rattle and shakes it in different ways to see how the sound changes is demonstrating her ability to modify her cognitive scheme about shaking rattles.
Substage 4: Coordination of secondary circular reactions	From 8 to 12 months	In this stage, infants begin to use more calculated approaches to producing events, coordinating several schemes to generate a single act. They achieve object performance during this stage.	An infant will push one toy out of the way to reach another toy that is lying, partially exposed, under it.
Substage 5: Tertiary circular reactions	From 12 to 18 months	At this age, infants develop what Piaget regards as the deliberate variation of actions that bring desirable consequences. Rather than just repeating enjoyable activities, infants appear to carry out miniature experiments to observe the consequences.	A child will drop a toy repeatedly, varying the position from which he drops it, carefully observing each time to see where it falls.
Substage 6: Beginnings of thought	From 18 months to 2 years	The major achievement of Substage 6 is the capacity for mental representation, or symbolic thought. Piaget argued that only at this stage can infants imagine where objects that they cannot see might be.	Children can plot in their heads unseen trajectories of objects, so that if a ball rolls under a piece of furniture, they can figure out where it is likely to emerge on the other side.

Figure 5-1 Cognitive Transitions

Infants do not suddenly shift from one stage of cognitive development to the next. Instead, Piaget argues that there is a period of transition in which some behavior reflects one stage, while other behavior reflects the more advanced stage. Does this gradualism argue against Piaget's interpretation of stages?



SUBSTAGE 1: SIMPLE REFLEXES. The first substage of the sensorimotor period is *Substage 1: Simple reflexes*, encompassing the first month of life. During this time, the various inborn reflexes, described in Chapter 3 and Chapter 4, are at the center of a baby's physical and cognitive life, determining the nature of his or her interactions with the world. For example, the sucking reflex causes the infant to suck at anything placed in his or her lips. This sucking behavior, according to Piaget, provides the newborn with information about objects—information that paves the way to the next substage of the sensorimotor period.

At the same time, some of the reflexes begin to accommodate the infant's experience with the nature of the world. For instance, an infant who is being breastfed but who also receives supplemental bottles may start to change the way he or she sucks, depending on whether a nipple is on a breast or a bottle.

SUBSTAGE 2: FIRST HABITS AND PRIMARY CIRCULAR REACTIONS. *Substage 2: First habits and primary circular reactions*, the second substage of the sensorimotor period, occurs from one to four months of age. In this period, infants begin to coordinate what were separate actions into single, integrated activities. For instance, an infant might combine grasping an object with sucking on it, or staring at something while touching it.

If an activity engages a baby's interests, he or she may repeat it over and over, simply for the sake of continuing to experience it. This repetition of a chance motor event helps the baby start building cognitive schemes through a process known as a *circular reaction*. *Primary circular reactions* are schemes reflecting an infant's repetition of interesting or

enjoyable actions that focus on the infant's own body, just for the enjoyment of doing them. Thus, when an infant first puts his thumb in his mouth and begins to suck, it is a mere chance event. However, when he repeatedly sucks his thumb in the future, it represents a primary circular reaction, which he is repeating because the sensation of sucking is pleasurable.

SUBSTAGE 3: SECONDARY CIRCULAR REACTIONS. In *Substage 3: Secondary circular reactions*, the infant's actions are more purposeful. According to Piaget, this third stage of cognitive development in infancy occurs from four to eight months of age. During this period, a child begins to act upon the outside world. For instance, infants now seek to repeat enjoyable events in their environments if they happen to produce them through chance activities. A child who repeatedly picks up a rattle in her crib and shakes it in different ways to see how the sound changes is demonstrating her ability to modify her cognitive scheme about shaking rattles. She is engaging in what Piaget calls secondary circular reactions.

Secondary circular reactions are schemes regarding repeated actions that bring about a desirable consequence. The major difference between primary circular reactions and secondary circular reactions is whether the infant's activity is focused on the infant and his or her own body (primary circular reactions) or involves actions relating to the world outside (secondary circular reactions).

During the third substage, babies' vocalization increases substantially as infants come to notice that if they make noises, other people around them will respond with noises of their own. Similarly, infants begin to imitate the sounds made by others. Vocalization becomes a secondary circular reaction that ultimately helps lead to the development of language and the formation of social relationships.

SUBSTAGE 4: COORDINATION OF SECONDARY CIRCULAR REACTIONS. One of the major leaps forward is *Substage 4: Coordination of secondary circular reactions*, which lasts from around 8 months to 12 months. Before this stage, behavior involved direct action on objects. When something happened by chance that caught an infant's interest, she attempted to repeat the event using a single scheme. However, in Substage 4, infants begin to employ *goal-directed behavior*, in which several schemes are combined and coordinated to generate a single act to solve a problem. For instance, they will push one toy out of the way to reach another toy that is lying, partially exposed, under it. They also begin to anticipate upcoming events. For instance, Piaget tells of his son Laurent, who at eight months "recognizes by a certain noise caused by air that he is nearing the end of his feeding and, instead of insisting on drinking to the last drop, he rejects his bottle" (Piaget, 1952, pp. 248–249).

object permanence
the realization that people and objects exist even when they cannot be seen

Infants' newfound purposefulness, their ability to use means to attain particular ends, and their skill in anticipating future circumstances owe their appearance in part to the developmental achievement of object permanence that emerges in Substage 4. **Object permanence** is the realization that people and objects exist even when they cannot be seen. It is a simple principle, but its mastery has profound consequences.

Consider, for instance, seven-month-old Chu, who has yet to learn the idea of object permanence. Chu's mother shakes a rattle in front of him, then takes the rattle and places it under a blanket. To Chu, who has not mastered the concept of object permanence, the rattle no longer exists. He will make no effort to look for it.

Several months later, when he reaches Substage 4, the story is quite different (see Figure 5-2). This time, as soon as

Infants in Substage 4 can coordinate their secondary circular reactions, displaying an ability to plan or calculate how to produce a desired outcome.

Figure 5-2 Object Permanence

Before an infant has understood the idea of object permanence, he will not search for an object that has been hidden right before his eyes. But several months later, he will search for it, illustrating that he has attained object permanence. Why is the concept of object permanence important?

Before Object Permanence

After Object Permanence

his mother places the rattle under the blanket, Chu tries to toss the cover aside, eagerly searching for the rattle. Chu clearly has learned that the object continues to exist even when it cannot be seen. For the infant who achieves an understanding of object permanence, then, out of sight is decidedly not out of mind.

The attainment of object permanence extends not only to inanimate objects, but to people, too. It gives Chu the security that his father and mother still exist even when they have left the room. This awareness is likely a key element in the development of social attachments, which we consider in Chapter 6. The recognition of object permanence also feeds infants' growing assertiveness: As they realize that an object taken away from them doesn't just cease to exist but is merely somewhere else, their only-too-human reaction may be to want it back—and quickly.

Although the understanding of object permanence emerges in Substage 4, it is only a rudimentary understanding. It takes several months for the concept to be fully comprehended, and infants continue for several months to make certain kinds of errors relating to object permanence. For instance, they often are fooled when a toy is hidden first under one blanket and then under a second blanket. In seeking out the toy, Substage 4 infants most often turn to the first hiding place, ignoring the second blanket under which the toy is currently located—even if the hiding was done in plain view.

WATCH THIS VIDEO ON MYPSYCHLAB OBJECT PERMANENCE ACROSS CULTURES

SUBSTAGE 5: TERTIARY CIRCULAR REACTIONS. *Substage 5: Tertiary circular reactions* is reached at around the age of 12 months and extends to 18 months. As the name of the stage indicates, during this period, infants develop tertiary circular reactions, which are schemes regarding the deliberate variation of actions that bring desirable consequences. Rather than just repeating enjoyable activities, as they do with secondary circular reactions, infants appear to carry out miniature experiments to observe the consequences.

For example, Piaget observed his son Laurent dropping a toy swan repeatedly, varying the position from which he dropped it, carefully observing each time to see where it fell. Instead of just repeating the action each time (as in a secondary circular reaction), Laurent made modifications in the situation to learn about their consequences. As you may recall from our discussion of research methods in Chapter 1, this behavior represents the

essence of the scientific method: An experimenter varies a situation in a laboratory to learn the effects of the variation. To infants in Substage 5, the world is their laboratory, and they spend their days leisurely carrying out one miniature experiment after another. Olivia, the baby described earlier who enjoyed dropping different things from her high chair, is a little scientist in action.

What is most striking about infants' behavior during Substage 5 is their interest in the unexpected. Unanticipated events are treated not only as interesting but also as something to be explained and understood. Infants' discoveries can lead to newfound skills, some of which may cause a certain amount of chaos, as Olivia's dad realized while cleaning up around her high chair.

With the attainment of the cognitive skill of deferred imitation, children are able to imitate people and scenes they have witnessed in the past.

SUBSTAGE 6: BEGINNINGS OF THOUGHT. The final stage of the sensorimotor period is *Substage 6: Beginnings of thought*, which lasts from around 18 months to two years. The major achievement of Substage 6 is the capacity for mental representation, or symbolic thought. A **mental representation** is an internal image of a past event or object. Piaget argued that by this stage infants can imagine where objects might be that they cannot see. They can even plot in their heads unseen trajectories of objects, so if a ball rolls under a piece of furniture, they can figure out where it is likely to emerge on the other side.

mental representation
an internal image of a past event or object

Because of children's new abilities to create internal representations of objects, their understanding of causality also becomes more sophisticated. For instance, consider Piaget's description of his son Laurent's efforts to open a garden gate:

> *Laurent tries to open a garden gate but cannot push it forward because it is held back by a piece of furniture. He cannot account either visually or by any sound for the cause that prevents the gate from opening, but after having tried to force it he suddenly seems to understand; he goes around the wall, arrives at the other side of the gate, moves the armchair which holds it firm, and opens it with a triumphant expression. (Piaget, 1954, p. 296)*

The attainment of mental representation also permits another important development: the ability to pretend. Using the skill of what Piaget refers to as **deferred imitation**, in which a person who is no longer present is imitated later, children are able to pretend that they are driving a car, feeding a doll, or cooking dinner long after they have witnessed such scenes played out in reality. To Piaget, deferred imitation provided clear evidence that children form internal mental representations.

deferred imitation
an act in which a person who is no longer present is imitated by children who have witnessed a similar act

Appraising Piaget: Support and Challenges

LO 5.3 Summarize the arguments both in support of and critical of Piaget's theory of cognitive development.

Most developmental researchers would probably agree that in many significant ways, Piaget's descriptions of how cognitive development proceeds during infancy are generally accurate (Harris, 1987; Marcovitch, Zelazo, & Schmuckler, 2003). Yet there is substantial disagreement over the validity of the theory and many of its specific predictions.

Let's start with what is clearly accurate about the Piagetian approach. Piaget was a masterful reporter of children's behavior, and his descriptions of growth during infancy remain a monument to his powers of observation. Furthermore, literally thousands of studies have supported Piaget's view that children learn much about the world by acting on objects in their environment. Finally, the broad outlines sketched out by Piaget of the sequence of cognitive development and the increasing cognitive accomplishments that occur during infancy are generally accurate (Schlottmann & Wilkening, 2012; Bibace, 2013; Müller, Ten Eycke, & Baker, 2015).

On the other hand, specific aspects of the theory have come under increasing scrutiny—and criticism—in the decades since Piaget carried out his pioneering work. For example, some researchers question the stage conception that forms the basis of Piaget's theory. Although, as noted earlier, even Piaget acknowledged that children's transitions

between stages are gradual, critics contend that development proceeds in a much more continuous fashion. Rather than showing major leaps of competence at the end of one stage and the beginning of the next, improvement comes in more gradual increments, growing step by step in a skill-by-skill manner.

For instance, developmental researcher Robert Siegler suggests that cognitive development proceeds not in stages but in "waves." According to Siegler, children don't one day drop a mode of thinking and the next take up a new form. Instead, there is an ebb and flow of cognitive approaches that children use to understand the world. One day children may use one form of cognitive strategy, while another day they may choose a less advanced strategy—moving back and forth over a period of time. Although one strategy may be used most frequently at a given age, children still may have access to alternative ways of thinking. Siegler thus sees cognitive development as in constant flux (Opfer & Siegler, 2007; Siegler, 2012; Siegler & Lortie-Forgues, 2014).

Other critics dispute Piaget's notion that cognitive development is grounded in motor activities. They charge that Piaget overlooked the importance of the sensory and perceptual systems that are present from a very early age in infancy—systems about which Piaget knew little, since so much of the research illustrating how sophisticated they are even in infancy was done relatively recently. Studies of children born without arms and legs (due to their mothers' unwitting use of teratogenic drugs during pregnancy, as described in Chapter 2) show that such children display normal cognitive development, despite their lack of practice with motor activities. This constitutes further evidence that the connection Piaget made between motor development and cognitive development was exaggerated (Decarrie, 1969; Butterworth, 1994).

To bolster their views, Piaget's critics also point to more recent studies that cast doubt on Piaget's view that infants are incapable of mastering the concept of object permanence until they are close to a year old. For instance, some work suggests that younger infants did not appear to understand object permanence because the techniques used to test their abilities were not sensitive enough to their true capabilities (Baillargeon, 2004, 2008; Walden et al., 2007; Bremer, Slater, & Johnson, 2015).

According to researcher Renée Baillargeon, infants as young as 3½ months have at least some understanding of object permanence. She argues that it may be that younger infants don't search for a rattle hidden under a blanket because they don't have the motor skills necessary to do the searching—not because they don't understand that the rattle still exists. Similarly, the apparent inability of young infants to comprehend object permanence may reflect more about infants' memory deficits than their lack of understanding of the concept: The memories of young infants may be so poor that they simply do not recall the earlier concealment of the toy (Hespos & Baillargeon, 2008).

Baillargeon has conducted ingenious experiments that demonstrate the earlier capabilities of infants in understanding object permanence. For example, in her *violation-of-expectation* studies, she repeatedly exposes infants to a physical event and then observes how they react to a variation of that event that is physically impossible. It turns out that infants as young as 3½ months show strong physiological reactions to impossible events, suggesting that they have some sense of object permanence far earlier than Piaget was able to discern (Luo, Kaufman, & Baillargeon, 2009; Scott & Baillargeon, 2013; Baillargeon et al., 2015).

Other types of behavior also seem to emerge earlier than Piaget suggested. For instance, recall the ability of neonates to imitate the basic facial expressions of adults just hours after birth, as discussed in Chapter 3. The presence of this skill at such an early age contradicts Piaget's view that initially infants are able to imitate only behavior that they see in others, using parts of their own body that they can plainly view—such as their hands and feet. In fact, facial imitation suggests that humans are born with a basic, innate capability for imitating others' actions, a capability that depends on certain kinds of environmental experiences, but one that Piaget believed develops later in infancy (Lepage & Théret, 2007; Legerstee & Markova, 2008; Gredebäck et al., 2012).

From *a caregiver's* perspective

In general, what are some implications for childrearing practices of Piaget's observations about the ways children gain an understanding of the world? Would you use the same approaches in childrearing for a child growing up in a non-Western culture? Why or why not?

Research on babies in non-Western cultures suggests that Piaget's stages are not universal but are to some degree culturally derived.

Piaget's work also seems to describe children from developed, Western countries better than those in non-Western cultures. For instance, some evidence suggests that cognitive skills emerge on a different timetable for children in non-Western cultures than for children living in Europe and the United States. Infants raised in the Ivory Coast of Africa, for example, reach the various substages of the sensorimotor period at an earlier age than infants reared in France (Dasen et al., 1978; Mistry & Saraswathi, 2003; Tamis-LeMonda et al., 2012).

Despite these problems regarding Piaget's view of the sensorimotor period, even his most passionate critics concede that he has provided us with a masterful description of the broad outlines of cognitive development during infancy. His failings seem to be in underestimating the capabilities of younger infants and in his claims that sensorimotor skills develop in a consistent, fixed pattern. Still, his influence has been enormous, and although the focus of many contemporary developmental researchers has shifted to newer information processing approaches that we discuss next, Piaget remains a pioneering figure in the field of development (Roth, Slone, & Dar, 2000; Kail, 2004; Maynard, 2008).

Module 5.1 Review

- Jean Piaget's theory of human cognitive development involves a succession of stages through which children progress from birth to adolescence. As humans move from one stage to another, the way they understand the world changes.
- The sensorimotor stage, from birth to about two years, involves a gradual progression through simple reflexes, single coordinated activities, interest in the outside world, purposeful combinations of activities, manipulation of actions to produce desired outcomes, and symbolic thought. The sensorimotor stage has six substages.
- Piaget is respected as a careful observer of children's behavior and a generally accurate interpreter of the way human cognitive development proceeds, though subsequent research on his theory does suggest several limitations.

Journal Writing Prompt

Applying Lifespan Development: How do schemes explain the way that an infant, a young child, and an adult will all react differently to the same object?

Information Processing Approaches to Cognitive Development

Amber Nordstrom, three months old, breaks into a smile as her brother Marcus stands over her crib, picks up a doll, and makes a whistling noise through his teeth. Amber never seems to tire of Marcus's efforts at making her smile, and soon whenever Marcus appears and simply picks up the doll, her lips begin to curl into a smile.

Clearly, Amber remembers Marcus and his humorous ways. But how does she remember him? And how much else can Amber remember?

To answer questions such as these, we need to diverge from the road that Piaget laid out for us. Rather than seeking to identify the universal, broad milestones in cognitive

development through which all infants pass, as Piaget tried to do, we must consider the specific processes by which individual babies acquire and use the information to which they are exposed. We need, then, to focus less on the qualitative changes in infants' mental lives and consider more closely their quantitative capabilities, as we do in this section.

The Foundations of Information Processing

LO 5.4 **Describe how infants process information according to information processing approaches to cognitive development.**

information processing approaches the model that seeks to identify the way that individuals take in, use, and store information

Information processing approaches to cognitive development seek to identify the way that individuals take in, use, and store information. According to this approach, the quantitative changes in infants' abilities to organize and manipulate information represent the hallmarks of cognitive development.

Taking this perspective, cognitive growth is characterized by increasing sophistication, speed, and capacity in processing information. Earlier, we compared Piaget's idea of schemes to computer software, which directs the computer in how to deal with data from the world. We might compare the information processing perspective on cognitive growth to the improvements that come from use of more efficient programs that lead to increased speed and sophistication in the processing of information. Information processing approaches, then, focus on the types of "mental programs" that people use when they seek to solve problems (Cohen & Cashon, 2003; Fagan & Ployhart, 2015).

ENCODING, STORAGE, AND RETRIEVAL. Information processing has three basic aspects: encoding, storage, and retrieval (see Figure 5-3). *Encoding* is the process by which information is initially recorded in a form usable to memory. Infants and children—indeed, all people—are exposed to a massive amount of information; if they tried to process it all, they would be overwhelmed. Consequently, they encode selectively, picking and choosing the information to which they will pay attention.

Even if someone has been exposed to the information initially and has encoded it in an appropriate way, there is still no guarantee that he or she will be able to use it in the future. Information must also have been stored in memory adequately. *Storage* refers to the placement of material into memory. Finally, success in using the material in the future depends on retrieval processes. *Retrieval* is the process by which material in memory storage is located, brought into awareness, and used.

We can use our comparison to computers again here. Information processing approaches suggest that the processes of encoding, storage, and retrieval are analogous to different parts of a computer. Encoding can be thought of as a computer's keyboard, through which one inputs information; storage is the computer's hard drive or a zip drive, where information is stored; and retrieval is analogous to software that accesses the information for display on the screen. Only when all three processes are operating—encoding, storage, and retrieval—can information be processed.

AUTOMATIZATION. In some cases, encoding, storage, and retrieval are relatively automatic, while in other cases they are deliberate. *Automatization* is the degree to which an activity requires attention. Processes that require relatively little attention are automatic;

Figure 5-3 Information Processing

The process by which information is encoded, stored, and retrieved.

processes that require relatively large amounts of attention are controlled. For example, some activities such as walking, eating with a fork, or reading may be automatic for you, but at first they required your full attention.

Automatic mental processes help children in their initial encounters with the world by enabling them to easily and "automatically" process information in particular ways. For instance, by the age of five, children automatically encode information in terms of frequency. Without a lot of attention to counting or tallying, they become aware, for example, of how often they have encountered various people, permitting them to differentiate familiar from unfamiliar people (Homae et al., 2012).

Furthermore, without intending to and without being aware of it, infants and children develop a sense of how often different stimuli are found together simultaneously. This permits them to develop an understanding of *concepts*, categorizations of objects, events, or people that share common properties. For example, by encoding the information that four legs, a wagging tail, and barking are often found together, we learn very early in life to understand the concept of "dog." Children—as well as adults—are rarely aware of how they learn such concepts, and they are often unable to articulate the features that distinguish one concept (such as a dog) from another (such as cat). Instead, learning tends to occur automatically.

Many of the tasks that are now automatic for you, such as holding a cup or using a fork, at one time required your full attention.

Some of the things we learn automatically are unexpectedly complex. For example, infants have the ability to learn subtle statistical patterns and relationships; these results are consistent with a growing body of research showing that the mathematical skills of infants are surprisingly good. Infants as young as five months old are able to calculate the outcome of simple addition and subtraction problems. In a study by developmental psychologist Karen Wynn, infants first were shown an object—a four-inch-high Mickey Mouse statuette. A screen was then raised, hiding the statuette. Next, the experimenter showed the infants a second, identical Mickey Mouse and then placed it behind the same screen (Wynn, 1992, 1995, 2000). Finally, depending on the experimental condition, one of two outcomes occurred. In the "correct addition" condition, the screen dropped, revealing the two statuettes (analogous to 1 + 1 = 2). But in the "incorrect addition" condition, the screen dropped to reveal just one statuette (analogous to the incorrect 1 + 1 = 1).

Because infants look longer at unexpected occurrences than at expected ones, the researchers examined the pattern of infants' gazes in the different conditions. In support of the notion that infants can distinguish between correct and incorrect addition, the infants in the experiment gazed longer at the incorrect result than at the correct one, indicating they expected a different number of statuettes. In a similar procedure, infants also looked longer at incorrect subtraction problems than at correct ones. The conclusion: Infants have rudimentary mathematical skills that enable them to understand whether a quantity is accurate.

The existence of basic mathematical skills in infants has been supported by findings that nonhumans are born with some basic numeric proficiency. Even newly hatched chicks show some counting abilities. And it is not too long into infancy that children demonstrate an understanding of such basic physics as movement trajectories and gravity (Gopnik, 2010; van Marle & Wynn, 2011; Hespos & van Marle, 2012).

The results of this growing body of research suggest that infants have an innate grasp of certain basic mathematical functions and statistical patterns. This inborn proficiency is likely to form the basis for learning more complex mathematics and statistical relationships later in life (McCrink & Wynn, 2009; van Marle & Wynn, 2009; Starr, Libertus, & Brannon, 2013; Posid & Cordes, 2015).

We turn now to several aspects of information processing, focusing on memory and individual differences in intelligence.

Memory during Infancy: They Must Remember This…

LO 5.5 **Describe the memory capabilities of infants their first two years of life.**

> *Arif Terzic was born during the war in Afghanistan. He spent his first two years hiding in a basement with his mother. The only light he saw came from a kerosene lamp. The only sounds he heard were his mother's hushed lullabies and the explosion of shells. Someone he never saw left food for them. There was a water faucet, but sometimes the water was too filthy to drink. At one point, his mother suffered a kind of breakdown. She fed him when she remembered. But she didn't speak. Or sing.*
>
> *Arif was lucky. His family emigrated to the United States when he was two. His father found work. They rented a little house. Arif went to preschool, then kindergarten. Today, he has friends, toys, a dog, and loves soccer. "He doesn't remember Afghanistan," his mother says. "It's like it never happened."*

How likely is it that Arif truly remembers nothing of his infancy? And if he ever does recall his first two years of life, how accurate will his memories be? To answer these questions, we need to consider the qualities of memory that exist during infancy.

memory
the process by which information is initially recorded, stored, and retrieved

MEMORY CAPABILITIES IN INFANCY. Certainly, infants have **memory** capabilities, defined as the process by which information is initially recorded, stored, and retrieved. As we've seen, infants can distinguish new stimuli from old, and this implies that some memory of the old must be present. Unless the infants had some memory of an original stimulus, it would be impossible for them to recognize that a new stimulus differed from the earlier one.

Infants who have learned the association between a moving mobile and kicking showed surprising recall ability when they were exposed to a reminder.

Infants' capability to recognize new stimuli from old tells us little, however, about how age brings about changes in the capacities of memory and in its fundamental nature. Do infants' memory capabilities increase as they get older? The answer is clearly affirmative. In one study, infants were taught that they could move a mobile hanging over the crib by kicking their legs. It took only a few days for two-month-old infants to forget their training, but six-month-old infants still remembered for as long as three weeks (Rovee-Collier, 1993, 1999).

Furthermore, infants who were later prompted to recall the association between kicking and moving the mobile showed evidence that the memory continued to exist even longer. Infants who had received just two training sessions lasting nine minutes each still recalled the association about a week later, as illustrated by the fact that they began to kick when they were placed in the crib with the mobile. Two weeks later, however, they made no effort to kick, suggesting that they had forgotten entirely.

But they hadn't forgotten: When the babies saw a reminder—a moving mobile—their memories were apparently reactivated. The infants could remember the association, following prompting, for as long as an additional month. Other evidence confirms these results, suggesting that hints can reactivate memories that at first seem lost and that the older the infant, the more effective such prompting is (DeFrancisco & Rovee-Collier, 2008; Moher, Tuerk & Feigenson, 2012; Brito & Barr, 2014).

Is infant memory qualitatively different from that in older children and adults? Researchers generally believe that information is processed similarly throughout the life span, even though the kind of information being processed changes and different parts of the brain may be used. According to memory expert Carolyn Rovee-Collier, people, regardless of their age, gradually lose memories, although, just like babies, they may regain them if reminders are provided. Moreover, the more times a memory is retrieved, the more enduring the memory becomes (Barr et al., 2007; Turati, 2008; Bell, 2012).

THE DURATION OF MEMORIES. Although the processes that underlie memory retention and recall seem similar throughout the life span, the quantity of information stored and recalled does differ markedly as infants develop. Older infants can retrieve information more rapidly, and they can remember it longer. But just how long? Can memories from infancy be recalled, for example, after babies grow up?

Researchers disagree on the age from which memories can be retrieved. Although early research supported the notion of **infantile amnesia**—the lack of memory for experiences occurring prior to three years of age—more recent research shows that infants do retain memories of these years. For example, in one study, six-month-old infants were shown a series of unusual events, such as intermittent periods of light and dark and strange sounds. When the children were later tested at the age of 1½ years or 2½ years, they demonstrated that they recalled the experience. Other research indicates that infants show memory for behavior and situations that they have seen only once (Howe, Courage, & Edison, 2004; Neisser, 2004; Callaghan, Li & Richardson, 2014).

Though researchers disagree as to the age from which memories can be retrieved, people generally cannot remember events or experiences that occurred before the age of three.

Such findings are consistent with evidence that the physical trace of a memory in the brain appears to be relatively permanent; this suggests that memories, even from infancy, may be enduring. However, memories may not be easily, or accurately, retrieved. For example, memories are susceptible to interference from other, newer information, which may displace or block out the older information, thereby preventing its recall.

infantile amnesia
the lack of memory for experiences that occurred prior to three years of age

One reason infants appear to remember less may be because language plays a key role in determining the way in which memories from early in life can be recalled: Older children and adults may only be able to report memories using the vocabulary that they had available at the time of the initial event, when the memories were stored. Because their vocabulary at the time of initial storage may have been quite limited, they are unable to describe the event later in life, even though it is actually in their memories (Simcock & Hayne, 2002; Heimann et al., 2006).

The question of how well memories formed during infancy are retained in adulthood remains not fully answered. Although infants' memories may be highly detailed and can be enduring if the infants experience repeated reminders, it is still not clear how accurate those memories remain over the course of the life span. Early memories are susceptible to misrecollection if people are exposed to related, and contradictory, information following the initial formation of the memory. Not only does such new information potentially impair recall of the original material, but the new material may be inadvertently incorporated into the original memory, thereby corrupting its accuracy (Cordón et al., 2004; Li, Callaghan, & Richardson, 2014).

In sum, the data suggest that although it is at least theoretically possible for memories to remain intact from a very young age—if subsequent experiences do not interfere with their recollection—in most cases memories of personal experiences in infancy do not last into adulthood. Current findings suggest that memories of personal experience seem not to become accurate before age 18 to 24 months (Howe, 2003; Howe et al., 2004; Bauer, 2007; also see the From Research to Practice box).

THE COGNITIVE NEUROSCIENCE OF MEMORY. Some of the most exciting research on the development of memory is coming from studies of the neurological basis of memory. Advances in brain scan technology, as well as studies of adults with brain damage, suggest that there are two separate systems involved with long-term memory. These two systems, called explicit memory and implicit memory, retain different sorts of information.

Explicit memory is memory that is conscious and can be recalled intentionally. When we try to recall a name or phone number, we're using explicit memory. In comparison, *implicit memory* consists of memories of which we are not consciously aware but that affect performance and behavior. Implicit memory consists of motor skills, habits, and activities that can be remembered without conscious cognitive effort, such as how to ride a bike or climb a stairway.

Explicit and implicit memories emerge at different rates and involve different parts of the brain. The earliest memories seem to be implicit, and they involve the cerebellum

From Research to Practice

Brain Growth May Be Responsible for Infantile Amnesia

What are your earliest memories? Perhaps you recall playing with a childhood friend, or your kindergarten teacher, or bits and pieces of your fifth birthday party. But try as you might, you almost certainly can't remember anything from your infancy. Nobody can. Psychologists have long considered the possible cause of this phenomenon, known as *infantile amnesia*, and attributed it to a lack of some function during this period of life—usually self-awareness or language—that impedes the proper encoding of memories. Now researchers are considering a different cause: the continuing growth of new brain cells.

The brain's ability to grow, change, and create new connections between cells is a good thing. This phenomenon, known as *neuroplasticity*, allows the brain to assimilate new information and in extreme cases even gives it some ability to overcome damage. But as you might imagine, there comes a point where new pathways developing in the brain can interfere with or replace existing pathways, thereby "crowding out" old information. Researchers hypothesized that the rapid growth of new brain cells in the developing infant brain thereby interferes with later recall of this period of life.

To test their hypothesis, neuroscientists Sheena Josselyn and Paul Frankland and colleagues conditioned adult mice to fear a specific stimulus. They then induced increased cell growth in the hippocampal region of the mice's brains—the area responsible for recording new memories. As predicted, these mice showed less of a fear response to the conditioned stimulus than did a control group of mice; the mice that experienced intervening brain cell growth in the hippocampus had forgotten their earlier conditioning. Josselyn and Frankland and their team showed the reverse pattern with infant mice, who naturally undergo rapid brain cell development (and also experience infantile amnesia). When this natural growth was hindered, the infant mice retained information better than unhindered controls (Akers, Martinez-Canabal, Restivo, & Yiu, 2014).

What can a mouse tell us about infant memory?

After infancy the rapid growth of brain cells slows, arriving at a balance between plasticity and stability that allows the recording of new memories while mostly retaining the old ones. Some forgetting still occurs, of course, but this is also a good thing. Most things we do are pretty mundane, Frankland says. "For healthy adult memory function, you need not only to be able to remember things but also to clear out the inconsequential memories" (Sneed, 2014, p. 28).

Shared Writing Prompt

Might there be some benefit to forgetting the events of infancy?

and brain stem. The forerunner of explicit memory involves the hippocampus, but true explicit memory doesn't emerge until the second half of the first year. When explicit memory does emerge, it involves an increasing number of areas of the cortex of the brain (Squire & Knowlton, 1995; Bauer, 2007; Low & Perner, 2012).

Individual Differences in Intelligence: Is One Infant Smarter Than Another?

LO 5.6 Explain how infant intelligence is measured using information processing approaches.

> *Maddy Rodriguez is a bundle of curiosity and energy. At six months of age, she cries heartily if she can't reach a toy, and when she sees a reflection of herself in a mirror, she gurgles and seems, in general, to find the situation quite amusing.*
>
> *Jared Lynch, at six months, is a good deal more inhibited than Maddy. He doesn't seem to care much when a ball rolls out of his reach, losing interest in it rapidly. And, unlike Maddy, when he sees himself in a mirror, he pretty much ignores the reflection.*

As anyone who has spent any time at all observing more than one baby can tell you, not all infants are alike. Some are full of energy and life, apparently displaying a natural-born

curiosity, while others seem, by comparison, somewhat less interested in the world around them. Does this mean that such infants differ in intelligence?

Answering questions about how and to what degree infants vary in their underlying intelligence is not easy. Although it is clear that different infants show significant variations in their behavior, the issue of just what types of behavior may be related to cognitive ability is complicated. Interestingly, the examination of individual differences between infants was the initial approach taken by developmental specialists to understand cognitive development, and such issues still represent an important focus within the field.

Infant intelligence is difficult to define and measure. Is this infant displaying intelligent behavior?

WHAT IS INFANT INTELLIGENCE? Before we can address whether and how infants may differ in intelligence, we need to consider what is meant by the term *intelligence.* Educators, psychologists, and other experts on development have yet to agree upon a general definition of intelligent behavior, even among adults. Is it the ability to do well in scholastic endeavors? Proficiency in business negotiations? Competence in navigating across treacherous seas, such as that shown by peoples of the South Pacific who have no knowledge of Western navigational techniques?

It is even more difficult to define and measure intelligence in infants than it is in adults. Do we base it on the speed with which a new task is learned through classical or operant conditioning? How fast a baby becomes habituated to a new stimulus? The age at which an infant learns to crawl or walk? Even if we are able to identify particular behaviors that seem to differentiate one infant from another in terms of intelligence during infancy, we need to address a further, and probably more important, issue: How well do measures of infant intelligence relate to eventual adult intelligence?

Such questions are not simple, and no simple answers have been found. However, developmental specialists have devised several approaches (summarized in Table 5-2) to illuminate the nature of individual differences in intelligence during infancy.

DEVELOPMENTAL SCALES. Developmental psychologist Arnold Gesell formulated the earliest measure of infant development, which was designed to distinguish between normally developing and atypically developing babies (Gesell, 1946). Gesell based his scale on examinations of hundreds of babies. He compared their performance at different ages to learn what behaviors were most common at a particular age. If an infant varied significantly from the norms of a given age, he or she was considered to be developmentally delayed or advanced.

developmental quotient
an overall developmental score that relates to performance in four domains: motor skills, language use, adaptive behavior, and personal–social

Following the lead of researchers who sought to quantify intelligence through a specific score (known as an intelligence quotient, or IQ, score), Gesell (1946) developed a developmental quotient, or DQ. The **developmental quotient** is an overall developmental

Table 5-2 Approaches Used to Detect Differences in Intelligence during Infancy

Developmental quotient	Formulated by Arnold Gesell, the developmental quotient is an overall development score that relates to performance in four domains: motor skills (balance and sitting), language use, adaptive behavior (alertness and exploration), and personal-social behavior.
Bayley Scales of Infant Development	Developed by Nancy Bayley, the Bayley Scales of Infant Development evaluate an infant's development from 2 to 42 months. The Bayley Scales focus on two areas: mental (senses, perception, memory, learning, problem solving, and language) and motor abilities (fine and gross motor skills).
Visual-recognition memory measurement	Measures of visual-recognition memory, the memory and recognition of a stimulus that has been previously seen, also relate to intelligence. The more quickly an infant can retrieve a representation of a stimulus from memory, the more efficient, presumably, is that infant's information processing.

Table 5-3 Sample Items from the Bayley Scales of Infant Development

Age	2 months	6 months	12 months	17–19 months	23–25 months	38–42 months
Mental scale	Turns head to locate origin of sound; visibly responds to disappearance of face	Picks up cup by handle; notices illustrations in a book	Constructs tower of two cubes; can turn pages in a book	Mimics crayon stroke; labels objects in photo	Pairs up pictures; repeats a two-word sentence	Can identify four colors; past tense evident in speech; distinguishes gender
Motor scale	Can hold head steady and erect for 15 seconds; sits with assistance	Sits up without aid for 30 seconds; grasps foot with hands	Walks when holding onto someone's hand or furniture; holds pencil in fist	Stands on right foot without help; remains upright climbing stairs with assistance	Strings three beads; jumps length of 4 inches	Can reproduce drawing of a circle; hops two times on one foot; descends stairs, alternating feet

(**Source:** Based on Bayley, N. 1993. *Bayley Scales of Infant Development* [BSID-II], 2nd ed, San Antonio, TX: The Psychological Corporation.)

score that relates to performance in four domains: motor skills (for example, balance and sitting), language use, adaptive behavior (such as alertness and exploration), and personal-social (for example, adequately feeding and dressing oneself).

Bayley Scales of Infant Development
a measure that evaluates an infant's development from 2 to 42 months in two areas: mental and motor abilities

Later researchers have created other developmental scales. For instance, Nancy Bayley developed one of the most widely used measures for infants. The **Bayley Scales of Infant Development** evaluate an infant's development from 2 to 42 months. The Bayley Scales focus on two areas: mental and motor abilities. The mental scale focuses on the senses, perception, memory, learning, problem solving, and language, while the motor scale evaluates fine and gross motor skills (see Table 5-3). Like Gesell's approach, the Bayley yields a developmental quotient (DQ). A child who scores at an average level—meaning average performance for other children at the same age—receives a score of 100 (Bayley, 1969; Lynn, 2009; Bos, 2013; Greene et al., 2013).

The virtue of approaches such as those taken by Gesell and Bayley is that they provide a good snapshot of an infant's current developmental level. Using these scales, we can tell in an objective manner whether a particular infant falls behind or is ahead of his or her same-age peers.

The scales are particularly useful in identifying the latter. In these cases, infants need immediate special attention. Tests might be administered if a parent or physician believes that an infant is suffering from developmental delays and to assess the significance of such delays. Based on their scores, early intervention programs can be put in place (Aylward & Verhulst, 2000; Sonne, 2012; Bode et al., 2014).

What such scales are not useful for is predicting a child's future course of development. A child whose development is identified by these measures as relatively slow at the age of 1 year will not necessarily display slow development at age 5, or 12, or 25. The association between most measures of behavior during infancy and adult intelligence, then, is minimal (Molfese & Acheson, 1997; Murray et al., 2007).

From *a nurse's* perspective

In what ways is the use of such developmental scales as Gesell's or Bayley's helpful? In what ways is it dangerous? How would you maximize the helpfulness and minimize the danger if you were advising a parent?

INFORMATION PROCESSING APPROACHES TO INDIVIDUAL DIFFERENCES IN INTELLIGENCE. When we speak of intelligence in everyday parlance, we often differentiate between "quick" and "slow" individuals. According to research on the speed of information processing, such terms hold some truth. Contemporary approaches to infant intelligence suggest that the speed with which infants process information may correlate most strongly with later intelligence, as measured by IQ tests administered during adulthood (Rose & Feldman, 1997; Sigman, Cohen, & Beckwith, 1997).

How can we tell whether a baby is processing information quickly? To answer this question, most researchers use habituation tests. Infants who process information

efficiently ought to be able to learn about stimuli more quickly. Consequently, we would expect them to turn their attention away from a given stimulus more rapidly than those who are less efficient at information processing, leading to the phenomenon of habituation. Similarly, measures of *visual-recognition memory*, the memory and recognition of a stimulus that has been previously seen, also relate to IQ. The more quickly an infant can retrieve a representation of a stimulus from memory, the more efficient, presumably, is that infant's information processing (Rose, Jankowski, & Feldman, 2002; Robinson & Pascalis, 2005; Trainor, 2012).

Research using an information processing framework clearly suggests a relationship between information processing efficiency and cognitive abilities: Measures of how quickly infants lose interest in stimuli that they have previously seen, as well as their responsiveness to new stimuli, correlate moderately well with later measures of intelligence. Infants who are more efficient information processors during the 6 months following birth tend to have higher intelligence scores between 2 and 12 years of age, as well as higher scores on other measures of cognitive competence (Rose, Feldman, & Jankowski, 2009; Otsuka et al., 2014).

Other research suggests that abilities related to the *multimodal approach to perception* may offer clues about later intelligence. For instance, the ability to identify a stimulus that previously has been experienced through only one sense by using another sense (called *cross-modal transference*) is associated with intelligence. A baby who is able to recognize by sight a screwdriver that she has previously only touched, but not seen, is displaying cross-modal transference. Research has found that the degree of cross-modal transference displayed by an infant at age one—which requires a high level of abstract thinking—is associated with intelligence scores several years later (Rose, Feldman, & Jankowski, 2004).

Although information processing efficiency and cross-modal transference abilities during infancy relate moderately well to later IQ scores, we need to keep in mind two qualifications. First, even though there is an association between early information processing capabilities and later measures of IQ, the correlation is only moderately strong. Other factors, such as the degree of environmental stimulation, also play a crucial role in helping to determine adult intelligence. Consequently, we should not assume that intelligence is somehow permanently fixed in infancy.

Second, and perhaps even more important, intelligence measured by traditional IQ tests relates to a particular type of intelligence, one that emphasizes abilities that lead to academic, and certainly not artistic or professional, success. Consequently, predicting that a child may do well on IQ tests later in life is not the same as predicting that the child will be successful later in life.

Despite these qualifications, the relatively recent finding that an association exists between efficiency of information processing and later IQ scores does suggest some consistency of cognitive development across the life span. Whereas the earlier reliance on scales such as the Bayley led to the misconception that little continuity existed, the more recent information processing approaches suggest that cognitive development unfolds in a more orderly, continuous manner from infancy to the later stages of life. (Also see the *Are You an Informed Consumer of Development?* feature regarding ways of promoting infants' cognitive development.)

ASSESSING INFORMATION PROCESSING APPROACHES. The information processing perspective on cognitive development during infancy is very different from Piaget's. Rather than focusing on broad explanations of the *qualitative* changes that occur in infants' capabilities, as Piaget does, information processing looks at *quantitative* change. Piaget sees cognitive growth occurring in fairly sudden spurts; information processing sees more gradual, step-by-step growth. (Think of the difference between a track-and-field runner leaping hurdles versus a slow-but-steady marathon racer.)

Because information processing researchers consider cognitive development in terms of a collection of individual skills, they are often able to use more precise measures

Are You an Informed Consumer of Development?

What Can You Do to Promote Infants' Cognitive Development?

All parents want their children to reach their full cognitive potential, but sometimes efforts to reach this goal take a bizarre path. For instance, some parents spend hundreds of dollars enrolling in workshops with titles such as "How to Multiply Your Baby's Intelligence" and buying books with titles such as *How to Teach Your Baby to Read* (Doman & Doman, 2002).

Do such efforts ever succeed? Although some parents swear they do, there is no scientific support for the effectiveness of such programs. For example, despite the many cognitive skills of infants, no infant can actually read. Furthermore, "multiplying" a baby's intelligence is impossible, and such organizations as the American Academy of Pediatrics and the American Academy of Neurology have denounced programs that claim to do so.

On the other hand, certain things can be done to promote cognitive development in infants. The following suggestions, based on the findings of developmental researchers, offer a starting point (Gopnik, Meltzoff, & Kuhl, 2002; Cabrera, Shannon, & Tamis-LeMonda, 2007):

- **Provide infants the opportunity to explore the world.** As Piaget suggests, children learn by doing, and they need the opportunity to explore and probe their environment.
- **Be responsive to infants on both a verbal and a nonverbal level.** Try to speak *with* babies, as opposed to *at* them. Ask questions, listen to their responses, and provide further communication (Merlo, Bowman, & Barnett, 2007).
- **Read to your infants.** Although they may not understand the meaning of your words, they will respond to your tone of voice and the intimacy provided by the activity. Reading together also is associated with later literacy skills and begins to create a lifelong reading habit. The American Academy of Pediatrics recommends daily reading to children starting at the age of six months (American Academy of Pediatrics, 1997; Holland, 2008; Robb, Richert, & Wartella, 2009).

Even if they don't understand the meaning of the words, infants still benefit from being read to.

- **Keep in mind that you don't have to be with an infant 24 hours a day.** Just as infants need time to explore their world on their own, parents and other caregivers need time off from child-care activities.
- **Don't push infants and don't expect too much too soon.** Your goal should not be to create a genius; it should be to provide a warm, nurturing environment that will allow an infant to reach his or her potential.

of cognitive ability, such as processing speed and memory recall, than proponents of Piaget's approach. Still, the very precision of these individual measures makes it harder to get an overall sense of the nature of cognitive development, something at which Piaget was a master. It's as if information processing approaches focus more on the individual pieces of the puzzle of cognitive development, while Piagetian approaches focus more on the whole puzzle (Kagan, 2008; Quinn, 2008).

Ultimately, both Piagetian and information processing approaches are critical in providing an account of cognitive development in infancy. Coupled with advances in the biochemistry of the brain and theories that consider the effects of social factors on learning and cognition, the two help us paint a full picture of cognitive development.

Module 5.2 Review

- Information processing approaches consider quantitative changes in children's abilities to organize and use information. Cognitive growth is regarded as the increasing sophistication of encoding, storage, and retrieval.
- Infants clearly have memory capabilities from a very early age, although the duration and accuracy of such memories are unresolved questions.
- Traditional measures of infant intelligence focus on behavioral attainments, which can help identify developmental delays or advances but are not strongly related to measures of adult intelligence. Information processing approaches to assessing intelligence rely on variations in the speed and quality with which infants process information.

Journal Writing Prompt

Applying Lifespan Development: Describe some of the ways that intelligence in infants is measured. What are some of the challenges in measuring infant intelligence?

The Roots of Language

Vicki and Dominic were engaged in a friendly competition over whose name would be the first word their baby, Maura, said. "Say 'mama,'" Vicki would coo, before handing Maura over to Dominic for a diaper change. Grinning, he would take her and coax, "No, say 'daddy.'" Both parents ended up losing—and winning—when Maura's first word sounded more like "baba," and seemed to refer to her bottle.

Mama. No. Cookie. Dad. Jo. Most parents can remember their baby's first word, and no wonder. It's an exciting moment, this emergence of a skill that is, arguably, unique to human beings.

But those initial words are just the first and most obvious manifestations of language. Many months earlier, infants began to understand the language used by others to make sense of the world around them. How does this linguistic ability develop? What is the pattern and sequence of language development? And how does the use of language transform the cognitive world of infants and their parents? We consider these questions, and others, as we address the development of language during the first years of life.

The Fundamentals of Language: From Sounds to Symbols

LO 5.7 Outline the processes by which children learn to use language.

Language, the systematic, meaningful arrangement of symbols, provides the basis for communication. But it does more than this: It is closely tied to the way we think and how we understand the world. It enables us to reflect on people and objects and to convey our thoughts to others.

language
the systematic, meaningful arrangement of symbols, which provides the basis for communication

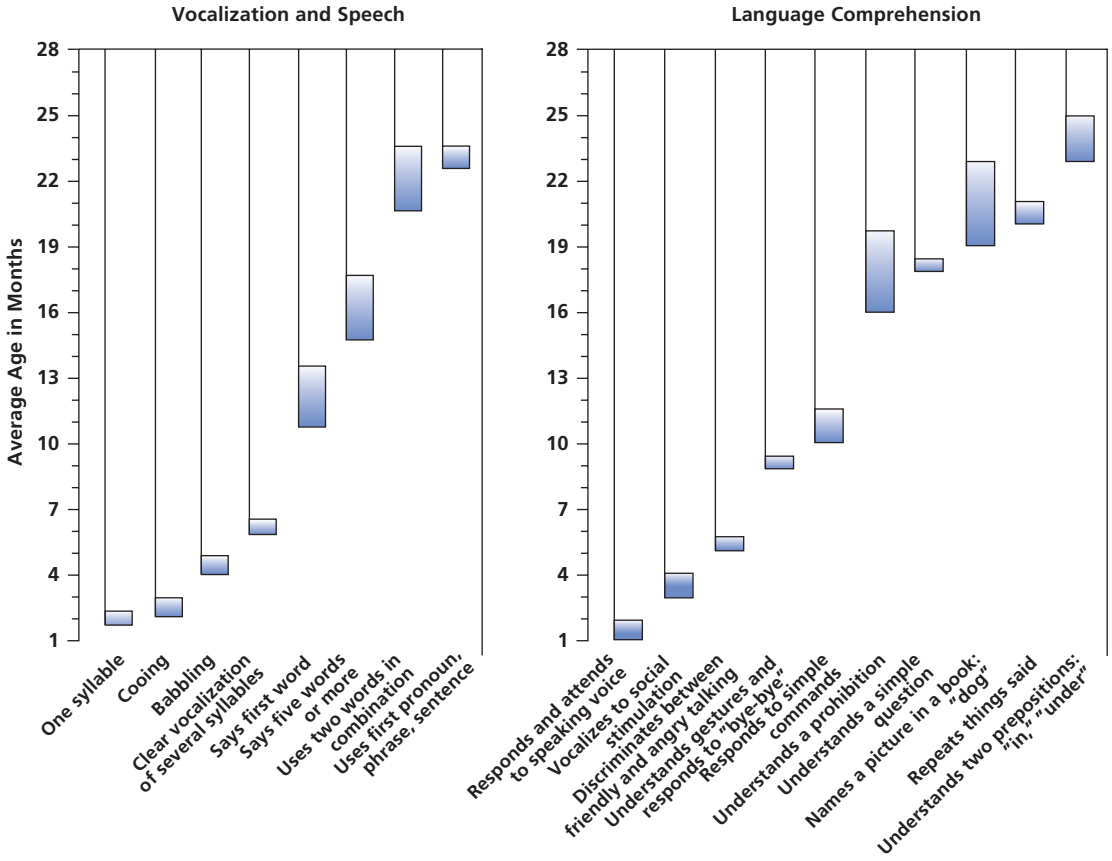
Language has several formal characteristics that must be mastered as linguistic competence is developed. They include:

- ***Phonology.*** Phonology refers to the basic sounds of language, called *phonemes*, that can be combined to produce words and sentences. For instance, the "a" in "mat" and the "a" in "mate" represent two different phonemes in English. Although English employs just 40 phonemes to create every word in the language, other languages have as many as 85 phonemes—and some as few as 15 (Akmajian, Demers, & Harnish, 1984).
- ***Morphemes.*** A morpheme is the smallest language unit that has meaning. Some morphemes are complete words, while others add information necessary for interpreting a word, such as the endings "-s" for plural and "-ed" for past tense.

Figure 5-4 Comprehension Precedes Production

Throughout infancy, the comprehension of speech precedes the production of speech.

(Source: Based on Bornstein & Lamb, 1992.)



- ***Semantics.*** Semantics are the rules that govern the meaning of words and sentences. As their knowledge of semantics develops, children are able to understand the subtle distinction between "Ellie was hit by a ball" (an answer to the question of why Ellie doesn't want to play catch) and "A ball hit Ellie" (used to announce the current situation).

In considering the development of language, we need to distinguish between linguistic *comprehension*, the understanding of speech, and linguistic *production*, the use of language to communicate. One principle underlies the relationship between the two: Comprehension precedes production. An 18-month-old may be able to understand a complex series of directions ("Pick up your coat from the floor and put it on the chair by the fireplace.") but may not yet have strung more than two words together when speaking for herself. Throughout infancy, comprehension also outpaces production. For instance, during infancy, comprehension of words expands at a rate of 22 new words a month, while production of words increases at a rate of about 9 new words a month, once talking begins (Rescorla, Alley, & Christine, 2001; Shafto et al., 2012; Phung, Milojevich, & Lukowski, 2014; see Figure 5-4).

EARLY SOUNDS AND COMMUNICATION. Spend 24 hours with even a very young infant and you will hear a variety of sounds: cooing, crying, gurgling, murmuring, and assorted types of other noises. These sounds, though not meaningful in themselves, play an important role in linguistic development, paving the way for true language (O'Grady & Aitchison, 2005; Martin, Onishi & Vouloumanos, 2012).

Prelinguistic communication is communication through sounds, facial expressions, gestures, imitation, and other nonlinguistic means. When a father responds to his

daughter's "ah" with an "ah" of his own, and then the daughter repeats the sound, and the father responds once again, they are engaged in prelinguistic communication. Clearly, the "ah" sound has no particular meaning. However, its repetition, which mimics the give-and-take of conversation, teaches the infant something about turn-taking and the back-and-forth of communication (Reddy, 1999).

The most obvious manifestation of prelinguistic communication is babbling. **Babbling**, making speech-like but meaningless sounds, starts at the age of two or three months and continues until around the age of one year. When they babble, infants repeat the same vowel sound over and over, changing the pitch from high to low (as in "ee-ee-ee," repeated at different pitches). After the age of five months, the sounds of babbling begin to expand, reflecting the addition of consonants (such as "bee-bee-bee-bee").

babbling
making speech-like but meaningless sounds

Babbling is a universal phenomenon, accomplished in the same way throughout all cultures. While they are babbling, infants spontaneously produce all of the sounds found in every language, not just the language they hear people around them speaking.

Even deaf children display their own form of babbling: Infants who cannot hear and who are exposed to sign language babble with their hands instead of their voices. Their gestural babbling thus is analogous to the verbal babbling of children who can hear. Furthermore, as shown in Figure 5-5, the areas of the brain activated during the production of hand gestures are similar to the areas activated during speech production, suggesting that spoken language may have evolved from gestural language (Gentilucci & Corballis, 2006; Caselli et al., 2012).

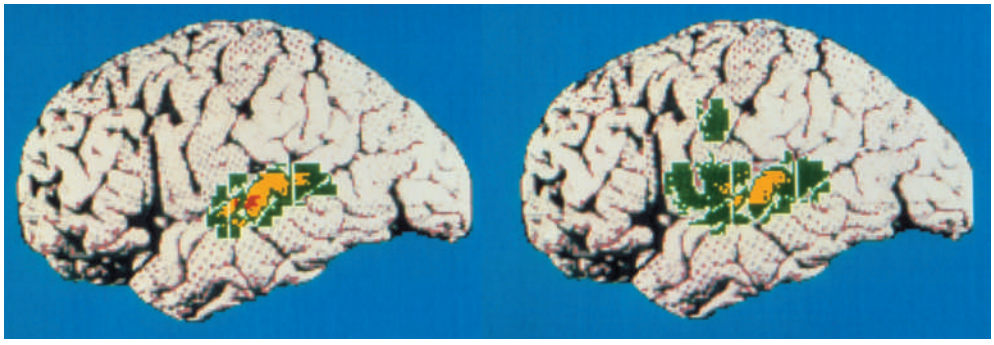
Babbling typically follows a progression from simple to more complex sounds. Although exposure to the sounds of a particular language does not seem to influence babbling initially, eventually experience does make a difference. By the age of six months, babbling reflects the sounds of the language to which infants are exposed (Blake & de Boysson-Bardies, 1992). The difference is so noticeable that even untrained listeners can distinguish between babbling infants who have been raised in cultures in which French, Arabic, or Cantonese languages are spoken. Furthermore, the speed at which infants begin homing in on their own language is related to the speed of later language development (Whalen, Levitt, & Goldstein, 2007; Depaolis, Vihman & Nakai, 2013; Masapollo, Polka & Ménard, 2015).

There are other indications of prelinguistic speech. For instance, consider five-month-old Marta, who spies her red ball just beyond her reach. After reaching for it and finding that she is unable to get to it, she makes a cry of anger that alerts her parents that something is amiss, and her mother hands it to her. Communication has occurred.

Four months later, when Marta faces the same situation, she no longer bothers to reach for the ball and doesn't respond in anger. Instead, she holds out her arm in the direction of the ball, and with great purpose, seeks to catch her mother's eye. When

Figure 5-5 Broca's Area

Areas of the brain that are activated during speech, left, are similar to areas activated during the production of hand gestures, right.



Deaf infants who are exposed to sign language do their own type of babbling, related to the use of signs.

her mother sees the behavior, she knows just what Marta wants. Clearly, Marta's communicative skills—though still prelinguistic—have taken a leap forward.

Even these prelinguistic skills are supplanted in just a few months, when the gesture gives way to a new communicative skill: producing an actual word. Marta's parents clearly hear her say "ball."

FIRST WORDS. When a mother and father first hear their child say "Mama" or "Dada," or even "baba," as in the case of Maura, the baby described earlier in this section, it is hard to be anything but delighted. But their initial enthusiasm may be dampened a bit when they find that the same sound is used to ask for a cookie, a doll, and a ratty old blanket.

First words generally are spoken somewhere around the age of 10 to 14 months but may occur as early as 9 months. Linguists differ on just how to recognize that a first word has actually been uttered. Some say it is when an infant clearly understands words and can produce a sound that is close to a word spoken by adults, such as a child who uses "mama" for any request she may have. Other linguists use a stricter criterion for the first word; they restrict "first word" to cases in which children give a clear, consistent name to a person, event, or object. In this view, "mama" counts as a first word only if it is consistently applied to the same person, seen in a variety of situations and doing a variety of things, and is not used to label other people (Hollich et al., 2000; Masataka, 2003; Koenig & Cole, 2013).

Although there is disagreement over when we can say a first word has been uttered, no one disputes that once an infant starts to produce words, vocabulary increases at a rapid rate. By the age of 15 months, the average child has a vocabulary of 10 words and methodically expands until the one-word stage of language development ends at around 18 months. Once that happens, a sudden spurt in vocabulary occurs. In just a short period—a few weeks somewhere between 16 and 24 months of age—there is an explosion of language, in which a child's vocabulary typically increases from 50 to 400 words (Nazzi & Bertoncini, 2003; McMurray, Aslin, & Toscano, 2009).

holophrases

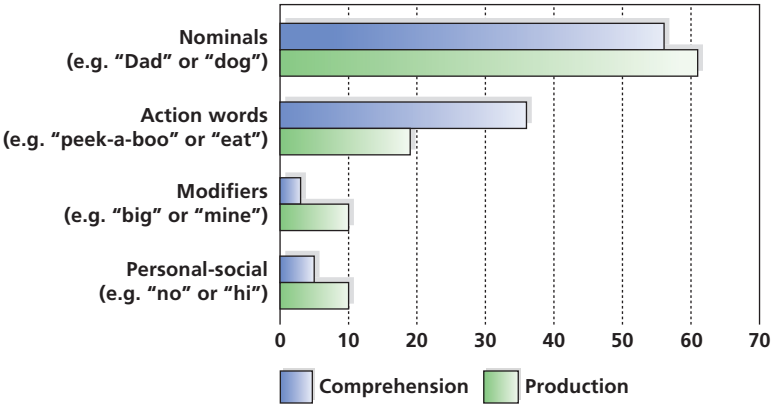
one-word utterances that stand for a whole phrase, whose meaning depends on the particular context in which they are used

As you can see from the list in Figure 5-6, the first words in children's early vocabularies typically regard objects and things, both animate and inanimate. Most often they refer to people or objects who constantly appear and disappear ("Mama"), to animals ("kitty"), or to temporary states ("wet"). These first words are often **holophrases**, one-word utterances that stand for a whole phrase, whose meaning depends on the particular context in which they are used. For instance, a youngster may use the phrase "ma" to mean, depending on the context, "I want to be picked up by Mom" or "I want something to eat, Mom" or "Where's Mom?" (Dromi, 1987; O'Grady & Aitchison, 2005).

Culture has an effect on the type of first words spoken. For example, unlike North American English-speaking infants, who are more apt to use nouns initially, Chinese Mandarin-speaking infants use more verbs than nouns. On the other hand, by the age of 20 months, there are remarkable cross-cultural similarities in the types of words spoken. For

Figure 5-6 The Top 50: The First Words Children Understand and Speak

(Source: Based on Benedict, 1979.)



Note: Percentage refers to percentage of children who include this type of word among their first 50 words.

example, a comparison of 20-month-olds in Argentina, Belgium, France, Israel, Italy, and the Republic of Korea found that children's vocabularies in every culture contained greater proportions of nouns than other classes of words (Tardif, 1996; Bornstein, Cote, & Maital, 2004; Andruski, Casielles & Nathan, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB LANGUAGE
DEVELOPMENT ACROSS CULTURES

FIRST SENTENCES. When Aaron was 19 months old, he heard his mother coming up the back steps, as she did every day just before dinner. Aaron turned to his father and distinctly said, "Ma come." In stringing those two words together, Aaron took a giant step in his language development.

The explosive increase in vocabulary that comes at around 18 months is accompanied by another accomplishment: the linking together of individual words into sentences that convey a single thought. Although there is a good deal of variability in the time at which children first create two-word phrases, it is generally around 8 to 12 months after they say their first word.

The linguistic advance represented by two-word combinations is important because the linkage not only provides labels for things in the world but also indicates the relations between them. For instance, the combination may declare something about possession ("Mama key") or recurrent events ("Dog bark"). Interestingly, most early sentences don't represent demands or even necessarily require a response. Instead, they are often merely comments and observations about events occurring in the child's world (O'Grady & Aitchison, 2005; Rossi et al., 2012).

Two-year-olds using two-word combinations tend to employ particular sequences that are similar to the ways in which adult sentences are constructed. For instance, sentences in English typically follow a pattern in which the subject of the sentence comes first, followed by the verb, and then the object ("Josh threw the ball"). Children's speech most often uses a similar order, although not all the words are initially included. Consequently, a child might say "Josh threw" or "Josh ball" to indicate the same thought. What is significant is that the order is typically not "threw Josh" or "ball Josh," but rather the usual order of English, which makes the utterance much easier for an English speaker to comprehend (Hirsh-Pasek & Michnick-Golinkoff, 1995; Masataka, 2003).

Although the creation of two-word sentences represents an advance, the language used by children still is by no means adult-like. As we've just seen, two-year-olds tend to leave out words that aren't critical to the message, similar to the way we might write a telegram for which we were paying by the word. For that reason, their talk is often called **telegraphic speech**. Rather than saying, "I put on my shoes," a child using telegraphic speech might say, "My shoes on." "I want to ride the pony" might become "I want pony" (see Table 5-4).

telegraphic speech
speech in which words not critical to the message are left out

Early language has other characteristics that differentiate it from the language used by adults. For instance, consider Sarah, who refers to the blanket she sleeps with as "blankie." When her Aunt Ethel gives her a new blanket, Sarah refuses to call the new one a "blankie," restricting the word to her original blanket.

Table 5-4 Children's Imitation of Sentences Showing Decline of Telegraphic Speech

Sample Sentences	Speaker	26 months	29 months	32 months	35 months
I put on my shoes	Kim Darden	Shoes Shoes on	My shoes My shoes on	I put on shoes Put on shoes	A Put on my shoes
I will not go to bed	Kim Darden	No bed Not go bed	Not go bed I not go bed	I not go bed I not go to bed	I not go to bed I will not go bed
I want to ride the pony	Kim Darden	Pony, pony Want pony	Want ride pony I want pony	I want ride pony I want the pony	I want to ride pony A

A = accurate imitation.
(**Source:** Based on R. Brown & C. Fraser, 1963.)

underextension
the overly restrictive use of words; common among children just mastering spoken language

Sarah's inability to generalize the label of "blankie" to blankets in general is an example of **underextension**, using words too restrictively, which is common among children just mastering spoken language. Underextension occurs when language novices think that a word refers to a specific instance of a concept, instead of to all examples of the concept (Caplan & Barr, 1989; Masataka, 2003).

overextension
the overly broad use of words, overgeneralizing their meaning

As infants like Sarah grow more adept with language, the opposite phenomenon sometimes occurs. In **overextension**, words are used too broadly, overgeneralizing their meaning. For example, when Sarah refers to buses, trucks, and tractors as "cars," she is guilty of overextension, making the assumption that any object with wheels must be a car. Although overextension reflects speech errors, it also shows that advances are occurring in the child's thought processes: The child is beginning to develop general mental categories and concepts (McDonough, 2002).

referential style
a style of language use in which language is used primarily to label objects

expressive style
a style of language use in which language is used primarily to express feelings and needs about oneself and others

Infants also show individual differences in the style of language they use. For example, some use a **referential style**, in which language is used primarily to label objects. Others tend to use an **expressive style**, in which language is used mainly to express feelings and needs about oneself and others (Bates et al., 1994; Nelson, 1996; Bornstein, 2000). Language styles reflect, in part, cultural factors. For example, mothers in the United States label objects more frequently than do Japanese mothers, encouraging a more referential style of speech. In contrast, mothers in Japan are more apt to speak about social interactions, encouraging a more expressive style of speech (Fernald & Morikawa, 1993).

The Origins of Language Development

LO 5.8 Differentiate the major theories of language development.

The immense strides in language development during the preschool years raise a fundamental question: How does proficiency in language come about? Linguists are deeply divided on how to answer this question.

LEARNING THEORY APPROACHES: LANGUAGE AS A LEARNED SKILL. One view of language development emphasizes the basic principles of learning. According to the **learning theory approach**, language acquisition follows the basic laws of reinforcement and conditioning discussed in Chapter 1 (Skinner, 1957). For instance, a child who articulates the word "da" may be hugged and praised by her father, who jumps to the conclusion that she is referring to him. This reaction reinforces the child, who is more likely to repeat the word. In sum, the learning theory perspective on language acquisition suggests that children learn to speak by being rewarded for making sounds that approximate speech. Through the process of *shaping*, language becomes more and more similar to adult speech.

learning theory approach to language
the theory that language acquisition follows the basic laws of reinforcement and conditioning

There's a problem, though, with the learning theory approach. It doesn't seem to adequately explain how children acquire the rules of language as readily as they do. For instance, young children are reinforced when they make errors. Parents are apt to be just as responsive if their child says, "Why the dog won't eat?" as they are if the child phrases the question more correctly ("Why won't the dog eat?"). Both forms of the question are understood correctly, and both elicit the same response; reinforcement is provided for both correct and incorrect language usage. Under such circumstances, learning theory is hard-put to explain how children learn to speak properly.

In what ways do parents shape their children's speaking abilities?

Children are also able to move beyond specific utterances they have heard and produce novel phrases, sentences, and constructions, an ability that also cannot be explained by learning theory. Furthermore, children can apply linguistic rules to nonsense words. In one study, four-year-old children heard the nonsense verb "to pilk" in the sentence "the bear is pilking the horse." Later, when asked what was happening

to the horse, they responded by placing the nonsense verb in the correct tense and voice: "He's getting pilked by the bear."

NATIVIST APPROACHES: LANGUAGE AS AN INNATE SKILL. Such conceptual difficulties with the learning theory approach have led to the development of an alternative, championed by linguist Noam Chomsky and known as the nativist approach (1968, 1978, 1991, 1999, 2005). The **nativist approach** argues that there is a genetically determined, innate mechanism that directs the development of language. According to Chomsky, people are born with an innate capacity to use language, which emerges, more or less automatically, due to maturation.

nativist approach to language
the theory that a genetically determined, innate mechanism directs language development

Chomsky's analysis of different languages suggests that all the world's languages share a similar underlying structure, which he calls **universal grammar**. In this view, the human brain is wired with a neural system called the **language-acquisition device (LAD)** that both permits the understanding of language structure and provides a set of strategies and techniques for learning the particular characteristics of the language to which a child is exposed. In this view, language is uniquely human, made possible by a genetic predisposition to both comprehend and produce words and sentences (Lidz & Gleitman, 2004; Stromswold, 2006; Wommacott, 2013; Bolhuis et al., 2014).

universal grammar
Noam Chomsky's theory that all the world's languages share a similar underlying structure

language-acquisition device (LAD)
a neural system of the brain hypothesized to permit understanding of language

Support for Chomsky's nativist approach comes from recent findings identifying a specific gene related to speech production. Further support comes from research showing that language processing in infants involves brain structures similar to those in adult speech processing, suggesting an evolutionary basis for language (Dehaene-Lambertz, Hertz-Pannier, & Dubois, 2006).

The view that language is an innate ability unique to humans also has its critics. For instance, some researchers argue that certain primates are able to learn at least the basics of language, an ability that calls into question the uniqueness of the human linguistic capacity. Others point out that although humans may be genetically primed to use language, its use still requires significant social experience in order for it to be used effectively (Savage-Rumbaugh et al., 1993; Goldberg, 2004).

THE INTERACTIONIST APPROACHES. Neither the learning theory nor the nativist perspective fully explains language acquisition. As a result, some theorists have turned to a theory that combines both schools of thought. The **interactionist approach to language** suggests that language development is produced through a combination of genetically determined predispositions and environmental circumstances that help teach language.

interactionist approach to language
the perspective that suggests that language development is produced through a combination of genetically determined predispositions and environmental circumstances that help teach language

The interactionist perspective accepts that innate factors shape the broad outlines of language development. However, interactionists also argue that the specific course of language development is determined by the language to which children are exposed and the reinforcement they receive for using language in particular ways. Social factors are considered to be key to development, since the motivation provided by one's membership in a society and culture and one's interactions with others leads to the use of language and the growth of language skills (Dixon, 2004; Yang, 2006; Graf Estes, 2014).

Just as there is support for some aspects of learning theory and nativist positions, the interactionist perspective has also received some support. We don't know, at the moment, which of these positions will ultimately provide the best explanation. It is more likely that different factors play different roles at different times during childhood. The full explanation for language acquisition, then, remains to be found.

Speaking to Children: The Language of Infant-Directed Speech and Gender-Related Speech

LO 5.9 Describe how children influence adults' language.

Say the following words aloud: Do you like the applesauce?

Now pretend that you are going to ask the same question of an infant, and speak it as you would for a young child's ears.

Chances are several things happened when you translated the phrase for the infant. First of all, the wording probably changed, and you may have said something like, "Does baby like the applesauce?" At the same time, the pitch of your voice probably rose, your general intonation most likely had a singsong quality, and you probably separated your words carefully.

infant-directed speech
a type of speech directed toward infants; characterized by short, simple sentences

INFANT-DIRECTED SPEECH. The shift in your language was due to your use of **infant-directed speech**, a style of speech that characterizes much of the verbal communication directed toward infants. This type of speech pattern used to be called *motherese* because it was assumed that it applied only to mothers. However, that assumption was wrong, and the gender-neutral term *infant-directed speech* is now used more frequently.

Infant-directed speech is characterized by short, simple sentences. Pitch becomes higher, the range of frequencies increases, and intonation is more varied. There is also repetition of words, and topics are restricted to items that are assumed to be comprehensible to infants, such as concrete objects in the baby's environment. (Infants are not the only ones who are the recipients of a specific form of speech: we change our style of speech when speaking to foreigners, as well; Soderstrom, 2007; Schachner & Hannon, 2011; Scott & Henderson, 2013).

Sometimes infant-directed speech includes amusing sounds that are not even words, imitating the prelinguistic speech of infants. In other cases, it has little formal structure, but is similar to the kind of telegraphic speech that infants use as they develop their own language skills.

Infant-directed speech changes as children become older. Around the end of the first year, infant-directed speech takes on more adult-like qualities. Sentences become longer and more complex, although individual words are still spoken slowly and deliberately. Pitch is also used to focus attention on particularly important words (Soderstrom et al., 2008; Kitamura & Lam, 2009).

Infant-directed speech plays an important role in infants' acquisition of language. As discussed next, infant-directed speech occurs all over the world, though there are cultural variations. Newborns prefer such speech to regular language, a fact that suggests that they may be particularly receptive to it. Furthermore, some research suggests that babies who are exposed to a great deal of infant-directed speech early in life seem to begin to use words and exhibit other forms of linguistic competence earlier (Englund & Behne, 2006; Soderstrom, 2007; Werker et al., 2007; Bergelson & Swingley, 2012).



Motherese, or, more precisely, infant-directed speech, includes the use of short, simple sentences and is said in a pitch that is higher than that used with older children and adults, and it is similar across cultures.

Developmental Diversity and Your Life

Is Infant-Directed Speech Similar in All Cultures?

Do mothers in the United States, Sweden, and Russia speak the same way to their infants?

In some respects, they clearly do. Although the words themselves differ across languages, the way the words are spoken to infants is quite similar. According to a growing body of research, there are basic similarities across cultures in the nature of infant-directed speech (Werker et al., 2007; Broesch & Bryant, 2015).

For example, 6 of the 10 most frequent major characteristics of speech directed at infants used by native speakers of English and Spanish are common to both languages: exaggerated intonation, high pitch, lengthened vowels, repetition, lower volume, and heavy stress on certain key words (such as emphasizing the word "ball" in the sentence, "No, that's a ball") (Blount, 1982). Similarly, mothers in the United States, Sweden, and Russia all exaggerate and elongate the pronunciation of the three-vowel sounds of "ee," "ah," and "oh" when speaking to infants in similar ways, despite differences in the languages in which the sounds are used (Kuhl et al., 1997).

Even deaf mothers use a form of infant-directed speech: When communicating with their infants, deaf mothers use sign language at a significantly slower tempo than when communicating with adults, and they frequently repeat the signs (Swanson, Leonard, & Gandour, 1992; Masataka, 1996, 1998, 2000).

The cross-cultural similarities in infant-directed speech are so great, in fact, that they appear in some facets of language specific to particular types of interactions. For instance, evidence comparing American English, German, and Mandarin Chinese speakers shows that in each of the languages, pitch rises when a mother is attempting to get an infant's attention or produce a response, while pitch falls when she is trying to calm an infant (Papousek & Papousek, 1991).

Why do we find such similarities across very different languages? One hypothesis is that the characteristics of infant-directed speech activate innate responses in infants. As we have noted, infants seem to prefer infant-directed speech over adult-directed speech, suggesting that their perceptual systems may be more responsive to such characteristics. Another explanation is that infant-directed speech facilitates language development, providing cues as to the meaning of speech before infants have developed the capacity to understand the meaning of words (Kuhl et al., 1997; Trainor & Desjardins, 2002; Falk, 2004).

Despite the similarities in the style of infant-directed speech across diverse cultures, there are some important cultural differences in the *quantity* of speech that infants hear from their parents. For example, although the Gusii of Kenya care for their infants in an extremely close, physical way, they speak to them less than American parents do (Levine, 1994).

There are also some stylistic differences related to cultural factors in the United States. A major factor, it seems, might be gender.

GENDER DIFFERENCES. To a girl, a bird is a birdie, a blanket a blankie, and a dog a doggy. To a boy, a bird is a bird, a blanket a blanket, and a dog a dog.

At least that's what parents of boys and girls appear to think, as illustrated by the language they use toward their sons and daughters. Virtually from the time of birth, the language parents employ with their children differs depending on the child's sex, according to research conducted by developmental psychologist Jean Berko Gleason (Gleason et al., 1994; Gleason & Ely, 2002; Arnon & Ramscar, 2012).

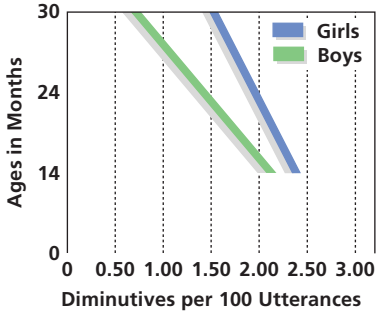
Gleason found that by the age of 32 months, girls hear twice as many diminutives (words such as "kitty" or "dolly" instead of "cat" or "doll") as boys hear. Although the use of diminutives declines with increasing age, their use consistently remains higher in speech directed at girls than in that directed at boys (see Figure 5-7).

Parents also are more apt to respond differently to children's requests depending on the child's gender. For instance, when turning down a child's request, mothers are likely to respond with a firm "no" to a male child but to soften the blow to a female child by providing a diversionary response ("Why don't you do this instead?") or by somehow making the refusal less direct. Consequently, boys tend to hear firmer, clearer language, while girls are exposed to warmer phrases, often referring to inner emotional states (Perlmann & Gleason, 1990).

Figure 5-7 Diminishing Diminutives

Although the use of diminutives toward both male and female infants declines with age, they are consistently used more often in speech directed at females. What do you think is the cultural significance of this difference?

(Source: Gleason et al., 1991.)



From *an educator's* perspective

What are some implications of differences in the ways adults speak to boys and girls? How might such speech differences contribute to later differences not only in speech, but also in attitudes?

Do such differences in language directed at boys and girls during infancy affect their behavior as adults? There is no direct evidence that plainly supports such an association, but men and women do use different sorts of language as adults. For instance, as adults, women tend to use more tentative, less assertive language ("Maybe we should try to go to a movie,") than men ("I know, let's go to a movie!"). Though we don't know if these differences are a reflection of early linguistic experiences, such findings are certainly intriguing (Tenenbaum & Leaper, 2003; Hartshorne & Ullman, 2006; Plante et al., 2006).

Module 5.3 Review

- Before they speak, infants understand many adult utterances and engage in several forms of prelinguistic communication, including the use of facial expressions, gestures, and babbling. Children typically produce their first words between 10 and 14 months, and rapidly increase their vocabularies from that point on, especially during a spurt at about 18 months. Children's language development proceeds through a pattern of holophrases, two-word combinations, and telegraphic speech.
- Learning theorists believe that basic learning processes account for language development, whereas nativists like Noam Chomsky and his followers argue that humans have an innate language capacity. The interactionists suggest that language is a consequence of both environmental and innate factors.
- When talking to infants, adults of all cultures tend to use infant-directed speech. An infant's gender also has an effect on his or her parents' speech.

Journal Writing Prompt

Applying Lifespan Development: Describe the cultural differences in the types of first words spoken by children.

Epilogue

In this chapter, we looked at infants' cognitive development from perspectives ranging from Piaget to information processing theory. We examined infant learning, memory, and intelligence, and we concluded the chapter with a look at language.

Before we proceed to social and personality development in the next chapter, turn back to the prologue of this chapter, about Raisa Novak, the infant who has just learned to crawl, and answer the following questions.

1. Is Raisa's experience with the radio/CD player an example of assimilation or accommodation, according to Piaget? Explain your reasoning.
2. Piaget believed that advances in motor capability signal the potential for cognitive advances. How does the story of Raisa support his theory?
3. If Raisa and her family left home for a month, do you think Raisa would still remember how to turn on the radio? What prompts might reactivate her memory?
4. How would you expect walking independently to further enhance Raisa's cognitive development?

Looking Back

LO 5.1 Summarize the fundamental features of Piaget's theory of cognitive development.

According to Piaget, all children pass gradually through the four major stages of cognitive development (sensorimotor, preoperational, concrete operational, and formal operational) and their various substages when they are at an appropriate level of maturation and are exposed to relevant types of experiences. In the Piagetian view, children's understanding grows through assimilation of their experiences into their current way of thinking or through accommodation of their current way of thinking to their experiences.

LO 5.2 Describe Piaget's sensorimotor stage of cognitive development.

During the sensorimotor period (birth to about two years) with its six substages, infants progress from the use of simple reflexes, through the development of repeated and integrated actions that gradually increase in complexity, to the ability to generate purposeful effects from their actions. By the end of the sixth substage of the sensorimotor period, infants are beginning to engage in symbolic thought.

LO 5.3 Summarize the arguments both in support of and critical of Piaget's theory of cognitive development.

Piaget is respected as a careful observer of children's behavior and a generally accurate interpreter of the way human cognitive development proceeds, though subsequent research on his theory does suggest several limitations.

LO 5.4 Describe how infants process information according to information processing approaches to cognitive development.

Information processing approaches to the study of cognitive development seek to learn how individuals receive, organize, store, and retrieve information. Such approaches differ from Piaget's by considering quantitative changes in children's abilities to process information.

LO 5.5 Describe the memory capabilities of infants their first two years of life.

Infants have memory capabilities from their earliest days, although the accuracy of infant memories is a matter of debate.

LO 5.6 Describe how infant intelligence is measured using information processing approaches.

Traditional measures of infant intelligence, such as Gesell's developmental quotient and the Bayley Scales of Infant Development, focus on average behavior observed at particular ages in large numbers of children. Information processing approaches to assessing intelligence rely on variations in the speed and quality with which infants process information.

LO 5.7 Outline the processes by which children learn to use language.

Prelinguistic communication involves the use of sounds, gestures, facial expressions, imitation, and other nonlinguistic means to express thoughts and states. Prelinguistic communication prepares the infant for speech. Infants typically produce their first words between the ages of 10 and 14 months. At around 18 months, children typically begin to link words together into primitive sentences that express single thoughts. Beginning speech is characterized by the use of holophrases, telegraphic speech, underextension, and overextension.

LO 5.8 Outline the major theories of language development.

The learning theory approach to language acquisition assumes that adults and children use basic behavioral processes—such as conditioning, reinforcement, and shaping—in language learning. A different approach proposed by Chomsky holds that humans are genetically endowed with a language-acquisition device, which permits them to detect and use the principles of universal grammar that underlie all languages.

LO 5.9 Describe how children influence adults' language.

Adult language is influenced by the children to whom it is addressed. Infant-directed speech takes on characteristics, surprisingly invariant across cultures, that make it appealing to infants and that probably encourage language development. Adult language also exhibits differences based on the gender of the child to whom it is directed, which may have effects that emerge later in life.

Key Terms and Concepts

schemes 168
assimilation 169
accommodation 169
sensorimotor stage (of cognitive development) 169
object permanence 171
mental representation 173
deferred imitation 173
information processing approaches 176
memory 178
infantile amnesia 179
developmental quotient 181
Bayley Scales of Infant Development 182
language 185
babbling 187
holophrases 188
telegraphic speech 189
underextension 190
overextension 190
referential style 190
expressive style 190
learning theory approach to language 190
nativist approach to language 191
universal grammar 191
language-acquisition device (LAD) 191
interactionist approach to language 191
infant-directed speech 192

Chapter 6

Social and Personality Development in Infancy

Learning Objectives

LO 6.1 Discuss how children express and experience emotions in the first two years of life.

LO 6.2 Differentiate stranger anxiety from separation anxiety.

LO 6.3 Discuss the development of social referencing and nonverbal decoding abilities.

LO 6.4 Describe the sense of self that children possess in the first two years of life.

LO 6.5 Summarize the theory of mind and evidence of infants' growing sense of mental activity by the age of two.

LO 6.6 Explain attachment in infancy and how it affects a person's future social competence.

LO 6.7 Describe the roles that caregivers play in infants' social development.

LO 6.8 Discuss the development of relationships in infancy.

LO 6.9 Describe individual differences that distinguish an infant's personality.

LO 6.10 Define temperament, and describe how it affects a child in the first two years of life.

LO 6.11 Discuss how the gender of a child affects his or her development in the first two years of life.

LO 6.12 Describe twenty-first-century families and their consequences for children.

LO 6.13 Summarize how nonparental child care affects infants.

Chapter Overview

Prologue: Emotional Rollercoaster

Chantelle Evans has always been a happy baby. That's why her mother Michelle was so surprised to find her 10-month-old daughter in tears when she returned to pick her up from a neighbor after having lunch with friends. "Chantelle knows Janine," Michelle says. "She sees her regularly out in the yard. I don't understand why she was so unhappy. I was only away for two hours." Janine told Michelle she had tried everything—rocking Chantelle, singing to her—but nothing helped. It wasn't until Chantelle, red-faced, tears streaming, saw her mother again that the baby smiled. ■

Looking Ahead

Michelle Evans will someday be able to have lunch with friends without worrying that her daughter is miserable, but Chantelle's reaction is perfectly normal for a 10-month-old baby. In this chapter, we consider social and personality development in infancy. We begin by examining the emotional lives of infants, considering which emotions they feel and how well they can read others' emotions. We also look at how others' responses shape infants' own reactions and how babies view their own and others' mental lives.

We then turn to infants' social relationships. We look at how they forge bonds of attachment and the ways they interact with family members and peers.

Finally, we cover the characteristics that differentiate one infant from another and discuss differences in the way children are treated depending on their gender. We'll consider the nature of family life and discuss how it differs from family life in earlier eras. The chapter closes with a look at the advantages and disadvantages of infant child care outside the home, a child-care option that today's families increasingly employ.

Beginning at birth, boys and girls are dressed differently.

Developing the Roots of Sociability

Germaine smiles when he catches a glimpse of his mother. Tawanda looks angry when her mother takes away the spoon that she is playing with. Sydney scowls when a loud plane flies overhead.

A smile. A look of anger. A scowl. The emotions of infancy are written all over a baby's face. Yet do infants experience emotions in the same way that adults do? When do they become capable of understanding what others are experiencing emotionally? And how do they use others' emotional states to make sense of their environment? We consider some of these questions as we seek to understand how infants develop emotionally and socially.

Emotions in Infancy: Do Infants Experience Emotional Highs and Lows?

LO 6.1 Discuss how children express and experience emotions in the first two years of life.

Anyone who spends any time at all around infants knows they display facial expressions that seem indicative of their emotional states. In situations in which we expect them to be happy, they seem to smile; when we might assume they are frustrated, they show anger; and when we might expect them to be unhappy, they look sad.

These basic facial expressions are remarkably similar across the most diverse cultures. Whether we look at babies in India, the United States, or the jungles of New Guinea, the expression of basic emotions is the same. Furthermore, the nonverbal expression of emotion, called *nonverbal encoding*, is fairly consistent among people of all ages. These consistencies have led researchers to conclude that we are born with the capacity to display basic emotions (Sullivan & Lewis, 2003; Ackerman & Izard, 2004; Bornstein, Suwalsky, & Breakstone, 2012).

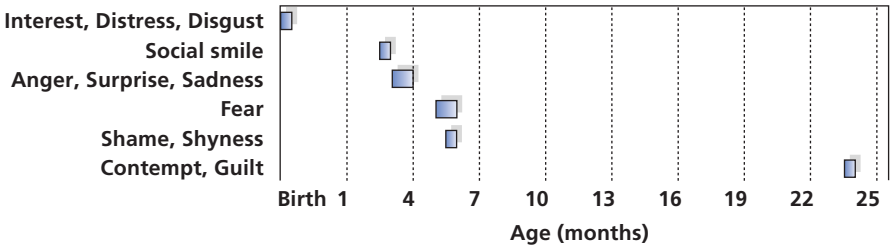
Infants display a fairly wide range of emotional expressions. According to research on what mothers see in their children's nonverbal behavior, almost all think that by the age of one month, their babies have expressed interest and joy. In addition, 84 percent of mothers think their infants have expressed anger, 75 percent surprise, 58 percent fear, and 34 percent sadness. Research using the *Maximally Discriminative Facial Movement Coding System (MAX)*, developed by developmental psychologist Carroll Izard, also finds that interest, distress, and disgust are present at birth, and that other emotions emerge over the next few months (see Figure 6-1). Such findings are consistent with the work of the famous naturalist Charles Darwin, whose 1872 book, *The Expression of the Emotions in Man and Animals*, argued that humans and primates have an inborn, universal set of emotional expressions—a view consistent with today's evolutionary approach to development (Izard, 1982; Benson, 2003; MacLean et al., 2014).

Across every culture, infants show similar facial expressions relating to basic emotions, such as this smile of joy. Do you think such expressions are similar in nonhuman animals?

Although infants display similar *kinds* of emotions, the *degree* of emotional expressivity varies among infants. Children in different cultures show reliable differences in emotional expressiveness, even during infancy. For example, by the age of 11 months, Chinese infants are generally less expressive than European, American, and Japanese infants (Eisenberg et al., 2000; Camras et al., 2007; Easterbrooks et al., 2013).

Figure 6-1 Emergence of Emotional Expressions

Emotional expressions emerge at roughly the times shown in the figure. Keep in mind that expressions in the first few weeks after birth do not necessarily reflect particular inner feelings.



EXPERIENCING EMOTIONS. Does the capability of infants to express emotions nonverbally in a consistent, reliable manner mean that they actually *experience* emotions, and—if they do—is the experience similar to that of adults?

To answer these questions, we need to consider just what emotions are. Developmentalists believe a true *emotion* has three components: a biological arousal component (such as increased breathing rate or heartbeat), a cognitive component (awareness of feeling anger or fear), and a behavioral component (e.g., displaying that one feels unhappy by crying).

Consequently, the fact that children display nonverbal expressions in a manner similar to that of adults does not necessarily mean that their actual experience is identical. If the nature of such displays is innate, or inborn, it is possible that facial expressions can occur without any accompanying awareness of their emotional experience (the cognitive component). Nonverbal expressions, then, might be emotionless in young infants, in much the same way that your knee reflexively jerks forward when a physician taps it, without the involvement of emotions (Soussignan et al., 1997).

Most developmental researchers, however, do not think this is the case: They argue that the nonverbal expressions of infants represent actual emotional experiences. Emotional expressions may not only reflect emotional experiences but may also help regulate the emotion itself. Developmental psychologist Carroll Izard suggests that infants are born with an innate repertoire of emotional expressions, reflecting basic emotional states, such as happiness and sadness. As infants and children grow older, they expand and modify these basic expressions and become more adept at controlling their nonverbal behavioral expressions. For example, they eventually may learn that by smiling at the right time, they can increase the chances of getting their own way. Emotional expressions thus have an adaptive function, permitting infants to express their needs nonverbally to caretakers before they have developed linguistic skills.

In sum, infants do appear to experience emotions, although the range of emotions at birth is fairly restricted. However, as they get older, infants both display and experience a wider range of increasingly complex emotions. Furthermore, in addition to *expressing* a wider variety of emotions, as children develop they also *experience* a wider array of emotions (Buss & Kiel, 2004; Killeen & Teti, 2012).

The advances in infants' emotional life are made possible by the increasing sophistication of their brains. Initially, the differentiation of emotions occurs as the cerebral cortex becomes operative in the first three months of life. By the age of 9 or 10 months, the structures that make up the limbic system (the site of emotional reactions) begin to grow. The limbic system starts to work in tandem with the frontal lobes, allowing for an increased range of emotions (Davidson, 2003; Schore, 2003; Swain et al., 2007).

SMILING. As Luz lay sleeping in her crib, her mother and father caught a glimpse of the most beautiful smile crossing her face. Her parents were sure that Luz was having a pleasant dream. Were they right?

Probably not. The earliest smiles expressed during sleep probably have little meaning, although no one can be absolutely sure. By six to nine weeks, babies begin to smile

Typically, infants display stranger anxiety near the end of the first year of life.

reliably at the sight of stimuli that please them, including toys, mobiles, and—to the delight of parents—people. The first smiles tend to be relatively indiscriminate, as infants first begin to smile at the sight of almost anything they find amusing. However, as they get older, they become more selective in their smiles.

A baby's smile in response to another person, rather than to nonhuman stimuli, is considered a **social smile**. As babies get older, their social smiles become directed toward particular individuals, not just anyone. By the age of 18 months, social smiling, directed more toward caregivers, becomes more frequent than smiling directed toward nonhuman objects. Moreover, if an adult is unresponsive to a child, the amount of smiling decreases. In short, by the end of the second year children are quite purposefully using smiling to communicate their positive emotions, and they are sensitive to the emotional expressions of others (Fogel et al., 2006; Reissland & Cohen, 2012; Wörmann et al., 2014).

social smile
smiling in response to other individuals

Stranger Anxiety and Separation Anxiety: It's Only Natural

LO 6.2 Differentiate stranger anxiety from separation anxiety.

"She used to be such a friendly baby," thought Erika's mother. "No matter whom she encountered, she had a big smile. But almost the day she turned seven months old, she began to react to strangers as if she were seeing a ghost. Her face crinkles up with a frown, and she either turns away or stares at them with suspicion. And she doesn't want to be left with anyone she doesn't already know. It's as if she has undergone a personality transplant."

What happened to Erika is, in fact, quite typical. By the end of the first year, infants often develop both stranger anxiety and separation anxiety. **Stranger anxiety** is the caution and wariness displayed by infants when encountering an unfamiliar person. Such anxiety typically appears in the second half of the first year.

stranger anxiety
the caution and wariness displayed by infants when encountering an unfamiliar person

What brings on stranger anxiety? Here, too, brain development and the increased cognitive abilities of infants play a role. As infants' memory develops, they are able to separate the people they know from the people they don't. The same cognitive advances that allow them to respond so positively to those people with whom they are familiar also give them the ability to recognize people who are unfamiliar. Furthermore, between six and nine months, infants begin trying to make sense of their world, endeavoring to anticipate and predict events. When something happens that they don't expect—such as when an unknown person appears—they experience fear. It's as if an infant has a question but is unable to answer it (Volker, 2007; Mash, Bornstein, & Arterberry, 2013).

Although stranger anxiety is common after the age of six months, significant differences exist between children. Some infants, particularly those who have a lot of experience with strangers, tend to show less anxiety than those whose experience with strangers is limited. Furthermore, not all strangers evoke the same reaction. For instance, infants tend to show less anxiety with female strangers than with male strangers. In addition, they react more positively to strangers who are children than to strangers who are adults, perhaps because their size is less intimidating (Swingler, Sweet, & Carver, 2007; Murray et al., 2007; Murray et al., 2008).

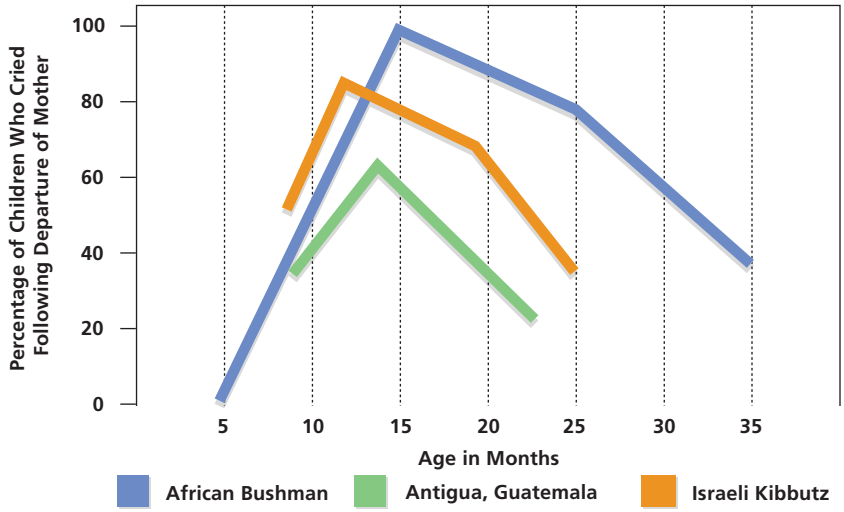
separation anxiety
the distress displayed by infants when a customary care provider departs

Separation anxiety is the distress displayed by infants when a customary care provider departs. Separation anxiety, which is also universal across cultures, usually

Figure 6-2 Separation Anxiety

Separation anxiety, the distress displayed by infants when their usual care provider leaves their presence, is a universal phenomenon beginning at around the age of seven or eight months. It peaks at around the age of 14 months and then begins to decline. Does separation anxiety have survival value for humans?

(**Source:** Kagan, Kearsley, & Zelazo, 1978.)



begins at about seven or eight months (see Figure 6-2). It peaks around 14 months, and then decreases. Separation anxiety is largely attributable to the same reasons as stranger anxiety. Infants' growing cognitive skills allow them to ask reasonable questions, but they may be questions whose answers they are too young to understand: "Why is my mother leaving?" "Where is she going?" and "Will she come back?"

Stranger anxiety and separation anxiety represent important social progress. They reflect both cognitive advances and the growing emotional and social bonds between infants and their caregivers—bonds that we'll consider later in the chapter when we discuss infants' social relationships.

Social Referencing: Feeling What Others Feel

LO 6.3 **Discuss the development of social referencing and nonverbal decoding abilities.**

> *Twenty-three-month-old Stephania watches as her older brother Eric and his friend Chen argue loudly with each other and begin to wrestle. Uncertain of what is happening, Stephania glances at her mother. Her mother, though, wears a smile, knowing that Eric and Chen are just playing. On seeing her mother's reaction, Stephania smiles too, mimicking her mother's facial expression.*

Like Stephania, most of us have been in situations in which we feel uncertain. In such cases, we sometimes turn to others to see how they are reacting. This reliance on others, known as social referencing, helps us decide what an appropriate response ought to be.

Social referencing is the intentional search for information about others' feelings to help explain the meaning of uncertain circumstances and events. Like Stephania, we use social referencing to clarify the meaning of a situation and thus reduce our uncertainty about what is occurring.

social referencing
the intentional search for information about others' feelings to help explain the meaning of uncertain circumstances and events

From *a social worker's* perspective

In what situations do adults rely on social referencing to work out appropriate responses? How might social referencing be used to influence parents' behavior toward their children?

Social referencing first occurs around the age of eight or nine months. It is a fairly sophisticated social ability: Infants need it to understand not only the significance of others' behavior, by using such cues as their facial expressions, but also the meaning of those behaviors within the context of a specific situation (Stenberg, 2009; Hepach & Westermann, 2013; Mireault, 2014).

Infants make particular use of facial expressions in their social referencing, the way Stephania did when she noticed her mother's smile. For instance, in one study infants were given an unusual toy to play with. The amount of time they played with it depended on their mothers' facial expressions. When their mothers displayed disgust, they played with it significantly less than when their mothers appeared pleased. Furthermore, when given the opportunity to play with the same toy later, the infants remained reluctant to play with it, despite the mothers' now neutral-appearing facial reactions, suggesting that parental attitudes may have lasting consequences (Hertenstein & Campos, 2004; Pelaez, Virues-Ortega, & Gewirtz, 2012).

TWO EXPLANATIONS OF SOCIAL REFERENCING. Although it is clear that social referencing begins fairly early in life, researchers are still not certain *how* it operates. It may be that observing someone else's facial expression brings about the emotion the expression represents. That is, an infant who views someone looking sad may come to feel sad herself, and her behavior may be affected. On the other hand, viewing another's facial expression may simply provide information. In this case, the infant does not experience the particular emotion represented by another's facial expression; she simply uses the display as data to guide her own behavior.

Both explanations for social referencing have received some support in research studies, and so we still don't know which is correct. What we do know is that social referencing is most likely to occur when a situation breeds uncertainty and ambiguity. Furthermore, infants who reach the age when they are able to use social referencing become quite upset if they receive conflicting nonverbal messages from their mothers and fathers. For example, if a mother shows with her facial expressions that she is annoyed with her son for knocking over a carton of milk, while his grandmother sees it as cute and smiles, the child receives two contradictory messages. Such mixed messages can be a real source of stress for an infant (Vaish & Striano, 2004; Schmitow & Stenberg, 2013).

DECODING OTHERS' FACIAL AND VOCAL EXPRESSIONS. The ability to employ social referencing is dependent on *nonverbal decoding* abilities to understand others' nonverbal behavior, which begin to emerge fairly soon after birth. Using these abilities, infants can interpret others' facial and vocal expressions that carry emotional meaning. For example, they can tell when a caregiver is happy to see them, and they pick up on worry or fear in the faces of others (Hernandez-Reif et al., 2006; Striano & Vaish, 2006; Hoehl et al., 2012).

Infants seem to be able to discriminate vocal expressions of emotion at a slightly earlier age than they discriminate facial expressions. Although relatively little attention has been given to infants' perception of vocal expressions, it does appear that they are able to discriminate happy and sad vocal expressions at the age of five months (Montague & Walker-Andrews, 2002; Dahl et al., 2014).

Scientists know more about the *sequence* in which nonverbal facial decoding ability progresses. In the first six to eight weeks, infants' visual precision is sufficiently limited that they cannot pay much attention to others' facial expressions. But they soon begin to discriminate among different facial expressions of emotion and even seem to be able to respond to differences in emotional intensity conveyed by facial expressions. They also respond to unusual facial expressions. For instance, they show distress when their mothers pose bland, unresponsive, or neutral facial expressions (Adamson & Frick, 2003; Bertin & Striano, 2006; Farroni et al., 2007).

By the time they are midway through their first year, infants already have begun to understand the emotions that lie behind the facial and vocal expressions of others. How

do we know this? One important clue comes from a study in which seven-month-old infants were shown a pair of facial expressions relating to joy and sadness, and simultaneously heard a vocalization representing either joy (a rising tone of voice) or sadness (a falling tone of voice). When the facial expression matched the tone, infants paid more attention, suggesting that they had at least a rudimentary understanding of the emotional meaning of facial expressions and voice tones (Grossmann, Striano, & Friederici, 2006; Kim & Johnson, 2013; Biro et al., 2014).

In sum, infants learn early both to produce and to decode emotions, and they begin to learn the effect of their own emotions on others. Such abilities play an important role not only in helping them experience their own emotions but also—as we see next—in using others' emotions to understand the meaning of ambiguous social situations (Buss & Kiel, 2004; Messinger et al., 2012).

The Development of Self: Do Infants Know Who They Are?

LO 6.4 **Describe the sense of self that children possess in the first two years of life.**

> *Elysa, eight months old, crawls past the full-length mirror that hangs on a door in her parents' bedroom. She barely pays any attention to her reflection as she moves by. On the other hand, her cousin Brianna, who is almost two years old, stares at herself in the mirror as she passes and laughs as she notices, and then rubs off, a smear of jelly on her forehead.*

Perhaps you have had the experience of catching a glimpse of yourself in a mirror and noticing a hair out of place. You probably reacted by attempting to push the unruly hair back into place. Your reaction shows more than that you care about how you look. It implies that you have a sense of yourself, the awareness and knowledge that you are an independent social entity to which others react, and which you attempt to present to the world in ways that reflect favorably upon you.

However, we are not born with the knowledge that we exist independently from others and the larger world. Very young infants do not have a sense of themselves as individuals; they do not recognize themselves in photos or mirrors. However, the roots of **self-awareness**, knowledge of oneself, begin to grow at around the age of 12 months. We know this from a simple but ingenious experimental technique. An infant's nose is secretly colored with a dab of red powder, and the infant is seated in front of a mirror. If infants touch their noses or attempt to wipe off the rouge, we have evidence that they have at least some knowledge of their physical characteristics. For them, this awareness is one step in developing an understanding of themselves as independent objects. For instance, Brianna, in the example at the beginning of this section, showed her awareness of her independence when she tried to rub the jam off her forehead (Asendorpf, Warkentin, & Baudonniere, 1996; Rochat, 2004; Rochat, Broesch, & Jayne, 2012).

self-awareness
knowledge of oneself

Although some infants as young as 12 months seem startled on seeing the rouge spot, for most a reaction does not occur until between 17 and 24 months of age. It is also around this age that children begin to show awareness of their own capabilities. For instance, infants who participate in experiments when they are between the ages of 23 and 25 months sometimes begin to cry if the experimenter asks them to imitate a complicated sequence of behaviors involving toys, although they readily accomplish simpler sequences. Their reaction suggests that they are conscious that they lack the ability to carry out difficult tasks and are unhappy about it—a reaction that provides a clear indication of self-awareness (Legerstee et al., 1998; Asendorpf, 2002).

Research suggests that this 18-month-old is exhibiting a clearly developed sense of self.

WATCH THIS VIDEO ON MYPSYCHLAB
SELF-AWARENESS TASK

Children's cultural upbringing also impacts the development of self-recognition. For instance, Greek children—who experience parenting practices that emphasize autonomy and separation—show self-recognition at an earlier age than children from Cameroon in Africa. In the Cameroonian culture, parenting practices emphasize body contact and warmth, leading to more interdependence between infants and parents, and ultimately later development of self-recognition (Keller et al., 2004; Keller, Voelker, & Yovsi, 2005).

In general, by the age of 18 to 24 months, infants in Western cultures have developed at least an awareness of their own physical characteristics and capabilities, and they understand that their appearance is stable over time. Although it is not clear how far this awareness extends, it is becoming increasingly evident that, as we discuss next, infants have not only a basic understanding of themselves but also the beginnings of an understanding of how the mind operates—what has come to be called a "theory of mind" (Lewis & Ramsay, 2004; Lewis & Carmody, 2008; Langfur, 2013).

Theory of Mind: Infants' Perspectives on the Mental Lives of Others—and Themselves

LO 6.5 **Summarize the theory of mind and evidence of infants' growing sense of mental activity by the age of two.**

theory of mind
knowledge and beliefs about how the mind works and how it affects behavior

What are infants' thoughts about thinking? According to a growing body of research, infants begin to understand certain things about their own and others' mental processes at quite an early age. Investigators have examined children's **theory of mind**, their knowledge and beliefs about how the mind works and how it influences behavior. Theories of mind are the explanations that children use to explain how others think.

For instance, the cognitive advances during infancy that we discussed in Chapter 5 permit older infants to see people in a very different way from other objects. They learn to see other people as *compliant agents*, beings similar to themselves who behave under their own power and who have the capacity to respond to infants' requests. Eighteen-month-old Chris, for example, has come to realize that he can ask his father to get him more juice (Rochat, 2004; Slaughter & Peterson, 2012).

In addition, children's capacity to understand intentionality and causality grows during infancy. For example, 10- and 13-month-olds are able to mentally represent social dominance, believing that larger size is related to the ability to dominate other, smaller-sized individuals and objects. Furthermore, infants have a kind of innate morality, in which they show a preference for helpfulness (Hamlin et al., 2011; Hamlin & Wynn, 2011; Thomsen et al., 2011; Sloane, Baillargeon, & Premack, 2012; Ruffman, 2014).

Furthermore, as early as 18 months, they begin to understand that others' behaviors have meaning and that the behaviors they see people enacting are designed to accomplish particular goals, in contrast to the "behaviors" of inanimate objects. For example, a child comes to understand that his father has a specific goal when he is in the kitchen making sandwiches. In contrast, his father's car is simply parked in the driveway, having no mental life or goal (Ahn, Gelman, & Amsterlaw, 2000; Wellman et al., 2008; Senju et al., 2011; also see the From Research to Practice box).

empathy
an emotional response that corresponds to the feelings of another person

Another piece of evidence for infants' growing sense of mental activity is that by the age of two, infants begin to demonstrate the rudiments of empathy. **Empathy** is an emotional response that corresponds to the feelings of another person. At 24 months of age, infants sometimes comfort others or show concern for them. In order to do this, they need to be aware of the emotional states of others. For example, one-year-olds are able to pick up emotional cues by observing the behavior of an actress on television (Gauthier, 2003; Mumme & Fernald, 2003).

Furthermore, during their second year, infants begin to use deception, both in games of "pretend" and in outright attempts to fool others. A child who plays "pretend" and who uses falsehoods must be aware that others hold beliefs about the world—beliefs that can be manipulated. In short, by the end of infancy children have developed the rudiments of their own personal theory of mind. It helps them understand the actions of others, and it affects their own behavior (van der Mark et al., 2002; Caron, 2009).

From Research to Practice

Do Infants Understand Morality?

You might think that infants don't have much of a social life beyond crying and smiling and sometimes laughing. But research shows that they understand far more than was commonly thought about social interaction, and even possess a rudimentary sense of morality—right or wrong, fair or unfair—that was once thought to develop years later.

In one study, infants at three months watched a puppet climb a hill. In some cases, another puppet helped the climbing one up the hill, while in other cases another puppet knocked the climbing one back down to the bottom. The infants later showed a preference for the helpful puppet over the mean puppet—and the social interaction is what made the difference, because the infants showed no such preference when the puppets moved inanimate objects up or down the hill (Hamlin, Wynn, & Bloom, 2010).

In another study, 21-month-olds observed an adult in the same room who either teased them with a toy that they ultimately refused to give them or tried to give them a toy but were unable to do so because their path was blocked. When the children had a later opportunity to be helpful, they were more likely to help the adult who tried to be nice to them than the one who teased them. It seems that even infants recognize who does and does not deserve their kindness. Other research shows that they also understand who does and does not deserve to be treated equally. Infants were unsurprised when they watched two adults perform a task and get equal rewards. But they did show surprise when they watched two adults get equal rewards after one had played while the other worked. Whether these principles of fairness are inborn or learned is still an open question, but either way, infants understand more about fairness than they might seem (Dunfield & Kuhlmeier, 2010; Sloane, Baillargeon, & Premack, 2012).

Shared Writing Prompt

What might be an advantage to helping only those who help you?

Module 6.1 Review

- Infants appear to express and to experience emotions, and their emotions broaden in range to reflect increasingly complex emotional states.
- As they develop cognitively and begin to distinguish familiar from unfamiliar people, infants begin to experience stranger anxiety at about six months and separation anxiety at around eight months of age.
- The ability to decode the nonverbal facial and vocal expressions of others develops early in infants. The use of nonverbal decoding to clarify situations of uncertainty and determine appropriate responses is called *social referencing*.
- Infants develop self-awareness, the knowledge that they exist separately from the rest of the world, after about 12 months of age.
- By the age of two, children have developed the rudiments of a theory of mind.

Journal Writing Prompt

Applying Lifespan Development: With reference to children's development of a theory of mind, why do children show empathy for other children?

Forming Relationships

Luis Camacho, now 38, clearly remembers the feelings that haunted him on the way to the hospital to meet his new sister Katy. Though he was only 4 at the time, that day of infamy is still vivid to him today. Luis would no longer be the only kid in the house; he would

have to share his life with a baby sister. She would play with his toys, read his books, be with him in the back seat of the car.

What really bothered him, of course, was that he would have to share his parents' love and attention with a new person. And not just any new person—a girl, who would automatically have a lot of advantages. Katy would be cuter, more needy, more demanding, more interesting—more everything—than he. He would be underfoot at best, neglected at worst.

Luis also knew that he was expected to be cheerful and welcoming. So he put on a brave face at the hospital and walked without hesitation to the room where his mother and Katy were waiting.

The arrival of a newborn brings a dramatic change to a family's dynamics. No matter how welcome a baby's birth, it causes a fundamental shift in the roles that people play within the family. Mothers and fathers must start to build a relationship with their infant, and older children must adjust to the presence of a new member of the family and build their own alliance with their infant brother or sister.

Although the process of social development during infancy is neither simple nor automatic, it is crucial: The bonds that grow between infants and their parents, siblings, family, and others provide the foundation for a lifetime's worth of social relationships.

Attachment: Forming Social Bonds

LO 6.6 Explain attachment in infancy and how it affects a person's future social competence.

attachment
the positive emotional bond that develops between a child and a particular individual

The most important aspect of social development that takes place during infancy is the formation of attachment. **Attachment** is the positive emotional bond that develops between a child and a particular, special individual. When children experience attachment to a given person, they feel pleasure when they are with them and feel comforted by their presence in times of distress. As we'll see when we consider social development in early adulthood (Chapter 14), the nature of our attachment during infancy affects how we relate to others throughout the rest of our lives (Grossman, Grossmann, & Waters, 2005; Hofer, 2006; Fisher, 2012; Bergman et al., 2015).

To understand attachment, the earliest researchers turned to the bonds that form between parents and children in the nonhuman animal kingdom. For instance, ethologist Konrad Lorenz (1965) observed newborn goslings, which have an innate tendency to follow their mother, the first moving object to which they typically are exposed after birth. Lorenz found that goslings whose eggs were raised in an incubator and who viewed him just after hatching would follow his every movement, as if he were their mother. As discussed in Chapter 3, he labeled this process *imprinting*: behavior that takes place during a critical period and involves attachment to the first moving object that is observed.

Lorenz's findings suggested that attachment was based on biologically determined factors, and other theorists agreed. For instance, Freud suggested that attachment grew out of a mother's ability to satisfy a child's oral needs.

Figure 6-3 Monkey Mothers Matter

Harlow's research showed that monkeys preferred the warm, soft "mother" to the wire "monkey" that provided food.

HARLOW'S MONKEYS. It turns out, however, that the ability to provide food and other physiological needs may not be as crucial as Freud and other theorists first thought. In a classic study, psychologist Harry Harlow gave infant monkeys the choice of cuddling a wire "monkey" that provided food or a soft, terry cloth monkey that was warm but did not provide food (see Figure 6-3). Their preference was clear: Baby monkeys spent most of their time clinging to the cloth monkey, although they made occasional expeditions to the wire monkey to nurse. Harlow suggested that the preference for the warm cloth monkey provided *contact comfort* (Harlow & Zimmerman, 1959; Blum, 2002).

Harlow's work illustrates that food alone is not the basis for attachment. Given that the monkeys' preference for the soft cloth "mothers" developed some time after birth, these findings are consistent with the research discussed in Chapter 3, showing little support for the existence of a critical period for bonding between human mothers and infants immediately following birth.

BOWLBY'S CONTRIBUTIONS TO OUR UNDERSTANDING OF ATTACHMENT. The earliest work on human attachment, which is still highly influential, was carried out by British psychiatrist John Bowlby (1951, 2007). In Bowlby's view, attachment is based primarily on infants' needs for safety and security—their genetically determined motivation to avoid predators. As they develop, infants come to learn that their safety is best provided by a particular individual. This realization ultimately leads to the development of a special relationship with that individual, who is typically the mother. Bowlby suggested that this single relationship with the primary caregiver is qualitatively different from the bonds formed with others, including the father—a suggestion that, as we'll see later, has been a source of some disagreement.

According to Bowlby, attachment provides a type of home base. As children become more independent, they can progressively roam further away from their secure base.

THE AINSWORTH STRANGE SITUATION AND PATTERNS OF ATTACHMENT. Developmental psychologist Mary Ainsworth built on Bowlby's theorizing to develop a widely used experimental technique to measure attachment (Ainsworth et al., 1978). The **Ainsworth Strange Situation** consists of a sequence of staged episodes that illustrate the strength of attachment between a child and (typically) his or her mother (see Figure 6-4). The "strange situation" follows this general eight-step pattern: (1) The mother and baby enter an unfamiliar room; (2) the mother sits down, leaving the baby free to explore; (3) an adult stranger enters the room and converses first with the mother and then with the baby; (4) the mother exits the room, leaving the baby alone with the stranger; (5) the mother returns, greeting and comforting the baby, and the stranger leaves; (6) the mother departs again, leaving the baby alone; (7) the stranger returns; and (8) the mother returns and the stranger leaves (Ainsworth et al., 1978; Pederson et al., 2014).

Infants' reactions to the various aspects of the Strange Situation vary considerably, depending on the nature of their attachment to their mothers. One-year-olds typically show one of four major patterns—secure, avoidant, ambivalent, and disorganized-disoriented (summarized in Table 6-1). Children who have a **secure attachment pattern** use the mother as the type of home base that Bowlby described. These children seem at ease in the Strange Situation as long as their mothers are present. They explore independently, returning to her occasionally. Although they may or may not appear upset when she leaves, securely attached children immediately go to her when she returns and seek contact. Most North American children—about two-thirds—fall into the securely attached category.

In contrast, children with an **avoidant attachment pattern** do not seek proximity to the mother, and after she has left, they typically do not seem distressed. Furthermore, they seem to avoid her when she returns. It is as if they are indifferent to her behavior. Some 20 percent of one-year-old children are in the avoidant category.

Children with an **ambivalent attachment pattern** display a combination of positive and negative reactions to their mothers. Initially, ambivalent children are in such close contact with the mother that they hardly explore their environment. They appear anxious even before the mother leaves, and when she does leave, they show great distress. But upon her return, they show ambivalent reactions, seeking to be close to her but also hitting

Ainsworth Strange Situation
a sequence of staged episodes that illustrates the strength of attachment between a child and (typically) his or her mother

secure attachment pattern
a style of attachment in which children use the mother as a kind of home base and are at ease when she is present; when she leaves, they become upset and go to her as soon as she returns

avoidant attachment pattern
a style of attachment in which children do not seek proximity to the mother; after the mother has left, they seem to avoid her when she returns as if they are angered by her behavior

Figure 6-4 The Ainsworth Strange Situation

In this illustration of the Ainsworth Strange Situation, the infant first explores the playroom on his own, as long as his mother is present. But when she leaves, he begins to cry. On her return, however, he is immediately comforted and stops crying. The conclusion: he is securely attached.

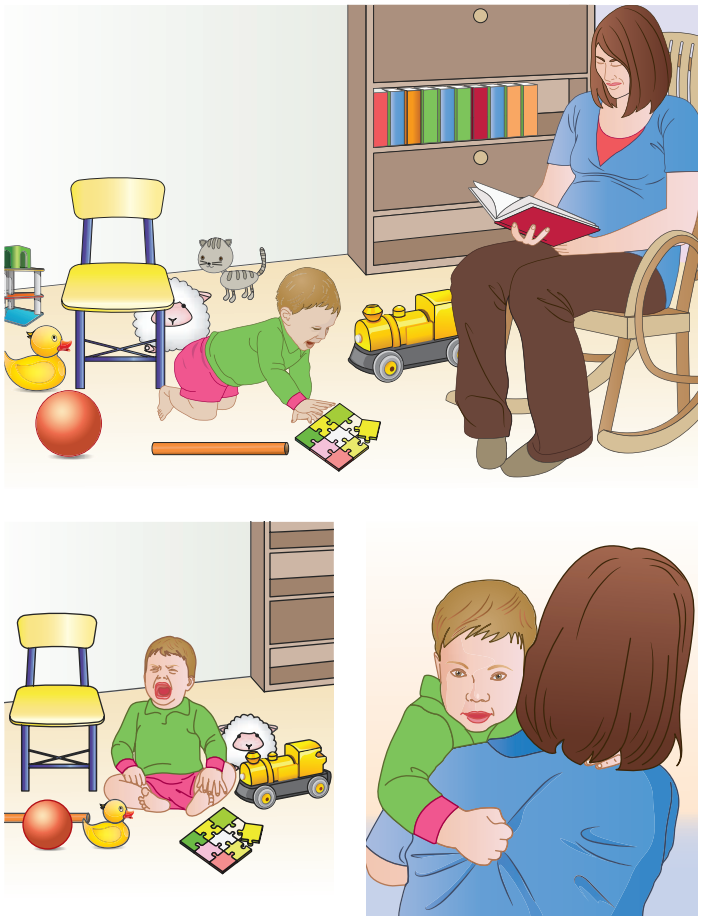


Table 6-1 Classifications of Infant Attachment

	Classification Criteria			
Label	**Seeking Proximity with Caregiver**	**Maintaining Contact with Caregiver**	**Avoiding Proximity with Caregiver**	**Resisting Contact with Caregiver**
Avoidant	Low	Low	High	Low
Secure	High	High (if distressed)	Low	Low
Ambivalent	High	High (often pre-separation)	Low	High
Disorganized-disoriented	Inconsistent	Inconsistent	Inconsistent	Inconsistent

ambivalent attachment pattern
a style of attachment in which children display a combination of positive and negative reactions to their mothers; they show great distress when the mother leaves, but upon her return they may simultaneously seek close contact but also hit and kick her

disorganized-disoriented attachment pattern
a style of attachment in which children show inconsistent, often contradictory behavior, such as approaching the mother when she returns but not looking at her; they may be the least securely attached children of all

and kicking, apparently in anger. About 10 to 15 percent of one-year-olds fall into the ambivalent classification (Cassidy & Berlin, 1994).

Although Ainsworth identified only three categories, a more recent expansion of her work finds that there is a fourth category: disorganized-disoriented. Children who have a **disorganized-disoriented attachment pattern** show inconsistent, contradictory, and confused behavior. They may run to the mother when she returns but not look at her, or seem initially calm and then suddenly break into angry weeping. Their confusion suggests that they may be the least securely attached children of all. About 5 to 10 percent of all children fall into this category (Mayseless, 1996; Cole, 2005; Bernier & Meins, 2008).

A child's attachment style would be of only minor consequence were it not for the fact that the quality of attachment between infants and their caregivers has significant consequences for relationships at later stages of life. For example, boys who are securely attached at the age of one year show fewer psychological difficulties at older ages than do avoidant or ambivalent children. Similarly, children who are securely attached as infants tend to be more socially and emotionally competent later, and others view them more positively. Adult romantic relationships are associated with the kind of attachment style developed during infancy (Mikulincer & Shaver, 2005; Simpson et al., 2007; MacDonald et al., 2008; Bergman, Blom, & Polyak, 2012).

At the same time, we cannot say that children who do not have a secure attachment style during infancy invariably experience difficulties later in life, nor can we say that those with a secure attachment at age one always have good adjustment later on. In fact, some evidence suggests that children with avoidant and ambivalent attachment—as measured by the Strange Situation—do quite well (Weinfield, Sroufe, & Egeland, 2000; Fraley & Spieker, 2003; Alhusen, Hayat, & Gross, 2013).

In cases in which the development of attachment has been severely disrupted, children may suffer from *reactive attachment disorder*, a psychological problem characterized by extreme problems in forming attachments to others. In young children, it can be displayed in feeding difficulties, unresponsiveness to social overtures from others, and a general failure to thrive. Reactive attachment disorder is rare and typically the result of abuse or neglect (Corbin, 2007; Hardy, 2007; Hornor, 2008; Schechter & Willheim, 2009).

Producing Attachment: The Roles of the Mother and Father

LO 6.7 Describe the roles that caregivers play in infants' social development.

As five-month-old Annie cries passionately, her mother comes into the room and gently lifts her from her crib. After just a few moments, as her mother rocks Annie and speaks softly, Annie's cries cease, and she cuddles in her mother's arms. But the moment her mother places her back in the crib, Annie begins to wail again, leading her mother to pick her up once again.

The pattern is familiar to most parents. The infant cries, the parent reacts, and the child responds in turn. Such seemingly insignificant sequences as these, repeatedly occurring in the lives of infants and parents, help pave the way for the development of relationships between children, their parents, and the rest of the social world. We'll consider how each of the major caregivers and the infant play a role in the development of attachment.

WATCH THIS VIDEO ON MYPSYCHLAB ATTACHMENT

MOTHERS AND ATTACHMENT. Sensitivity to their infants' needs and desires is the hallmark of mothers of securely attached infants. Such a mother tends to be aware of her child's moods, and she takes into account her child's feelings as they interact. She is also responsive during face-to-face interactions, provides feeding "on demand," and is warm and affectionate to her infant (McElwain & Booth-LaForce, 2006; Priddis & Howieson, 2009; Evans, Whittingham, & Boyd, 2012).

From *a social worker's* perspective

What might a social worker seeking to find a good home for a foster child look for when evaluating potential foster parents?

It is not only a matter of responding in *any* fashion to their infants' signals that separates mothers of securely attached and insecurely attached children. Mothers of secure infants tend to provide the appropriate level of response. Research has shown that overly responsive mothers are just as likely to have insecurely attached children as underresponsive mothers. In contrast, mothers whose communication involves *interactional synchrony*, in which caregivers respond to infants appropriately and both caregiver and child match emotional states, are more likely to produce secure attachment (Kochanska, 1998; Hane, Feldstein, & Dernetz, 2003).

The research showing the correspondence between mothers' sensitivity to their infants and the security of the infants' attachment is consistent with Ainsworth's arguments that attachment depends on how mothers react to their infants' emotional cues. Ainsworth suggests that mothers of securely attached infants respond rapidly and positively to their infants. For example, Annie's mother responds quickly to her cries by cuddling and comforting her. In contrast, mothers produce insecurely attached infants, according to Ainsworth, by ignoring their behavioral cues, behaving inconsistently with them, and ignoring and rejecting their social efforts. For example, picture a child who repeatedly and unsuccessfully tries to gain her mother's attention by calling or turning and gesturing from her stroller while her mother, engaged in conversation, ignores her. This baby is likely to be less securely attached than a child whose mother acknowledges her child more quickly and consistently (Higley & Dozier, 2009).

But how do mothers learn how to respond to their infants? One way is from their own mothers. Mothers typically respond to their infants based on their own attachment styles. As a result, there is substantial similarity in attachment patterns from one generation to the next (Benoit & Parker, 1994; Peck, 2003).

It is important to realize that a mother's (and others') behavior toward infants is at least in part a reaction to the child's ability to provide effective cues. A mother may not be able to respond effectively to a child whose own behavior is unrevealing, misleading, or ambiguous. For instance, children who clearly display their anger or fear or unhappiness will be easier to read—and respond to effectively—than children whose behavior is ambiguous. Consequently, the kind of signals an infant sends may in part determine how successful the mother will be in responding.

A growing body of research highlights the importance of a father's demonstration of love for his children. In fact, certain disorders such as depression and substance abuse have been found to be more related to fathers' than to mothers' behavior.

FATHERS AND ATTACHMENT. Up to now, we've barely touched upon one of the key players involved in the upbringing of a child: the father. In fact, if you looked at the early theorizing and research on attachment, you'd find little mention of the father and his potential contributions to the life of the infant.

There are at least two reasons for this absence. First, John Bowlby, who provided the initial theory of attachment, suggested that there was something unique about the mother–child relationship. He believed the mother was uniquely equipped, biologically, to provide sustenance for the child, and he concluded that this capability led to the development of a special relationship between mothers and children. Second, the early work on attachment was influenced by the traditional social views of the time, which considered it "natural" for the mother to be the primary caregiver, while the father's role was to work outside the home to provide a living for his family.

Several factors led to the demise of this view. One was that societal norms changed, and fathers began to take a more active role in childrearing activities. More important, it became increasingly clear from research findings that—despite societal norms that relegated fathers to secondary childrearing roles—some infants formed their primary initial relationship with their fathers (Brown et al., 2007; Diener et al., 2008; McFarland-Piazza et al., 2012).

In addition, a growing body of research has shown that fathers' expressions of nurturance, warmth, affection, support, and concern are extremely important to their children's emotional and social well-being. Certain kinds of psychological disorders, such as substance abuse and depression, have been found to be related more to fathers' than mothers' behavior (Roelofs et al., 2006; Condon et al., 2013; Braungart-Rieker et al., 2015).

Infants' social bonds extend beyond their parents, especially as they grow older. For example, one study found that although most infants formed their first primary relationship with one person, around one-third had multiple relationships, and it was difficult to determine which attachment was primary. Furthermore, by the time the infants were 18 months old, most had formed multiple relationships. In sum, infants may develop attachments not only to their mothers but to a variety of others as well (Silverstein & Auerbach, 1999; Booth, Kelly, & Spieker, 2003; Seibert & Kerns, 2009).

One reason for differences in attachment involves what fathers and mothers do with their children. Mothers tend to spend more time feeding and directly nurturing their children, while fathers often spend more time playing with infants.

ARE THERE DIFFERENCES IN ATTACHMENT TO MOTHERS AND FATHERS? Although infants are fully capable of forming attachments to both mother and father—as well as other individuals—the nature of attachment between infants and mothers, on the one hand, and infants and fathers, on the other hand, is not identical. For example, when they are in unusually stressful circumstances, most infants prefer to be soothed by their mother rather than by their father (Schoppe-Sullivan et al., 2006; Yu et al., 2012; Dumont & Paquette, 2013).

One reason for qualitative differences in attachment involves the differences in what fathers and mothers do with their children. Mothers spend a greater proportion of their time feeding and directly nurturing their children. In contrast, fathers spend more time, proportionally, playing with infants. Almost all fathers contribute to child care: Surveys show that 95 percent say they do some child-care chores every day. But on average they still do less than mothers. For instance, 30 percent of fathers with wives who work do three or more hours of daily child care. In comparison, 74 percent of employed married mothers spend that amount of time every day in child-care activities (Grych & Clark, 1999; Kazura, 2000; Whelan & Lally, 2002; Tooten et al., 2014).

Furthermore, fathers' play with their babies is often quite different from that of mothers. Fathers engage in more physical, rough-and-tumble activities with their children. In contrast, mothers play traditional games,

such as peek-a-boo and games with more verbal elements (Paquette, Carbonneau, & Dubeau, 2003).

These differences in the ways that fathers and mothers play with their children occur even in the minority of families in the United States in which the father is the primary caregiver. Moreover, the differences occur in very diverse cultures: Fathers in Australia, Israel, India, Japan, Mexico, and even in the Aka Pygmy tribe in Central Africa all engage more in play than in caregiving, although the amount of time they spend with their infants varies widely. For instance, Aka fathers spend more time caring for their infants than members of any other known culture, holding and cuddling their babies at a rate some five times higher than anywhere else in the world (Roopnarine, 1992; Hewlett & Lamb, 2002).

These similarities and differences in childrearing practices across different societies raise an important question: How does culture affect attachment? This issue is discussed in the *Developmental Diversity and Your Life* feature.

Developmental Diversity and Your Life

Does Attachment Differ across Cultures?

John Bowlby's observations of the biologically motivated efforts of the young of other species to seek safety and security were the basis for his views on attachment and his reason for suggesting that seeking attachment was biologically universal, a trait that we should find not only in other species but among humans of all cultures as well.

Research has shown, however, that human attachment is not as culturally universal as Bowlby predicted. Certain attachment patterns seem more likely among infants of particular cultures. For example, one study of German infants showed that most fell into the avoidant category. Other studies, conducted in Israel and Japan, have found a smaller proportion of infants who were securely attached than in the United States. Finally, comparisons of Chinese and Canadian children show that Chinese children are more inhibited than Canadians in the Ainsworth Strange Situation (Grossmann et al., 1982; Takahashi, 1986; Chen et al., 1998; Rothbaum et al., 2000; Kieffer, 2012).

Do such findings suggest that we should abandon the notion that attachment is a universal biological tendency? Not necessarily. Though it is possible that Bowlby's claim that the desire for attachment is universal was too strongly stated, most of the data on attachment have been obtained by using the Ainsworth Strange Situation, which may not be the most appropriate measure in non-Western cultures (Vereijken et al., 1997; Dennis, Cole, & Zahn-Waxler, 2002).

Attachment is now viewed as susceptible to cultural norms and expectations. Cross-cultural and within-cultural differences in attachment reflect the nature of the measure employed and the expectations of various cultures. Some developmental specialists suggest that attachment should

Japanese parents seek to avoid separation and stress during infancy and do not foster independence. As a result, Japanese children often have the appearance of being less securely attached according to the Ainsworth Strange Situation, but using other measurement techniques they may well score higher in attachment.

be viewed as a general tendency, but one that varies in the way it is expressed according to how actively caregivers in a society seek to instill independence in their children. Secure attachment, as defined by the Western-oriented Strange Situation, may be seen earliest in cultures that promote independence but may be delayed in societies in which independence is a less important cultural value (Rothbaum et al., 2000; Rothbaum, Rosen, & Ujiie, 2002).

Infant Interactions: Developing a Working Relationship

LO 6.8 Discuss the development of relationships in infancy.

Research on attachment is clear in showing that infants may develop multiple attachment relationships, and that over the course of time the specific individuals with whom the infant is primarily attached may change. These variations in attachment emphasize that the development of relationships is an ongoing process, not only during infancy but throughout our lifetimes.

PROCESSES UNDERLYING RELATIONSHIP DEVELOPMENT. Which processes underlie the development of relationships during infancy? For one thing, parents—and in fact all adults—appear to be genetically preprogrammed to be sensitive to infants. For instance, brain-scanning techniques have found that the facial features of infants (but not adults) activate a specialized structure in the brain called the *fusiform gyrus* within a seventh of a second. Such reactions may help elicit nurturing behavior and trigger social interaction (Kringelbach et al., 2008; Zebrowitz et al., 2009).

In addition, studies have found that, across almost all cultures, mothers behave in typical ways with their infants. They tend to exaggerate their facial and vocal expressions—the nonverbal equivalent of the infant-directed speech that they use when they speak to infants (as discussed in Chapter 5). Similarly, they often imitate their infants' behavior, responding to distinctive sounds and movements by repeating them. There are even types of games, such as peek-a-boo, itsy-bitsy spider, and pat-a-cake, that are nearly universal (Harrist & Waugh, 2002; Kochanska, 2002).

mutual regulation model
the model in which infants and parents learn to communicate emotional states to one another and to respond appropriately

Furthermore, according to the **mutual regulation model**, it is through these sorts of interactions that infants and parents learn to communicate emotional states to one another and to respond appropriately. For instance, in pat-a-cake, both infant and parent act jointly to regulate turn-taking behavior, with one individual waiting until the other completes a behavioral act before starting another. Consequently, at the age of three months, infants and their mothers have about the same influence on each other's behavior. Interestingly, by the age of six months, infants have more control over turn-taking, although by the age of nine months both partners once again become roughly equivalent in terms of mutual influence (Tronick, 2003).

One of the ways infants and parents signal each other when they interact is through facial expressions. As we saw earlier in this chapter, even quite young infants are able to read, or decode, the facial expressions of their caregivers, and they react to those expressions.

For example, an infant whose mother, during an experiment, displays a stony, immobile facial expression reacts by making a variety of sounds, gestures, and facial expressions of her own in response to such a puzzling situation—and possibly to elicit some new response from her mother. Infants also show more happiness themselves when their mothers appear happy, and they look at their mothers longer. On the other hand, infants are apt to respond with sad looks and to turn away when their mothers display unhappy expressions (Crockenberg & Leerkes, 2003; Reissland & Shepherd, 2006; Yato et al., 2008).

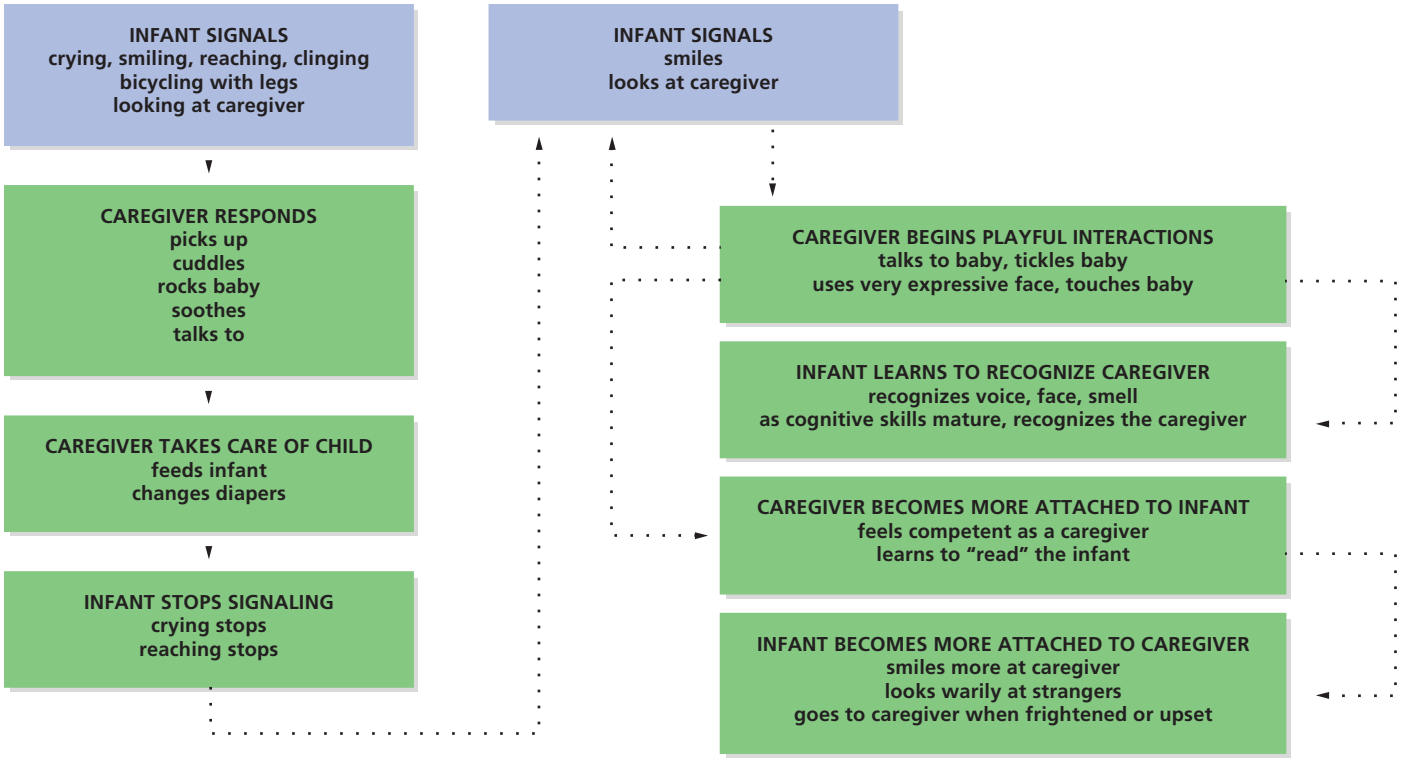
reciprocal socialization
a process in which infants' behaviors invite further responses from parents and other caregivers, which in turn bring about further responses from the infants

In short, the development of attachment in infants does not merely represent a reaction to the behavior of the people around them. Instead, there is a process of **reciprocal socialization**, in which infants' behaviors invite further responses from parents and other caregivers. In turn, the caregivers' behaviors bring about a reaction from the child, continuing the cycle. Recall, for instance, Annie, the baby who kept crying to be picked up when her mother put her in her crib. Ultimately, the actions and reactions of parents and child lead to an increase in attachment, forging and strengthening bonds between infants and caregivers as babies and caregivers communicate their needs and responses to each other. Figure 6-5 summarizes the sequence of infant–caregiver interaction (Kochanska & Aksan, 2004; Spinrad & Stifter, 2006).

Figure 6-5 Sequence of Infant–Caregiver Interaction

The actions and reactions of caregivers and infants influence each other in complex ways. Do you think a similar pattern shows up in adult–adult interactions?

(Source: Adapted from Bell & Ainsworth, 1972; Tomlinson-Keasey, 1985.)



INFANTS' SOCIABILITY WITH THEIR PEERS: INFANT–INFANT INTERACTION. How sociable are infants with other children? Although they do not form "friendships" in the traditional sense, babies do react positively to the presence of peers from early in life, and they engage in rudimentary forms of social interaction.

Infants' sociability is expressed in several ways. From the earliest months of life, they smile, laugh, and vocalize while looking at their peers. They show more interest in peers than in inanimate objects, and they pay greater attention to other infants than they do to a mirror image of themselves. They also begin to show preferences for peers with whom they are familiar compared with those they do not know. For example, studies of identical twins show that twins exhibit a higher level of social behavior toward each other than toward an unfamiliar infant (Eid et al., 2003; Legerstee, 2014; Kawakami, 2014).

Infants' level of sociability generally rises with age. Nine- to twelve-month-olds mutually present and accept toys, particularly if they know each other. They also play social games, such as peek-a-boo or crawl-and-chase. Such behavior is important, as it serves as a foundation for future social exchanges in which children will try to elicit responses from others and then offer reactions to those responses. These kinds of exchanges are important to learn because they continue even into adulthood. For example, someone who says, "Hi, what's up?" may be trying to elicit a response to which he or she can then reply (Endo, 1992; Eckerman & Peterman, 2001).

Finally, as infants age, they begin to imitate one another. For instance, 14-month-old infants who are familiar with one another sometimes reproduce each other's behavior. Such imitation serves a social function and can also be a powerful teaching tool (Ray & Heyes, 2011).

According to Andrew Meltzoff, a developmental psychologist at the University of Washington, a child's ability to impart this information is only one example of

how so-called expert" babies are able to teach skills and information to other infants. According to the research of Meltzoff and his colleagues, the abilities learned from the "experts" are retained and later used to a remarkable degree. Learning by exposure starts early in life. Recent evidence shows that even seven-week-old infants can perform delayed imitation of a novel stimulus to which they have earlier been exposed, such as an adult sticking the tongue out of the side of the mouth (Meltzoff & Moore, 1999; Meltzoff, 2002; Meltzoff, Waismeyer, & Gopnik, 2012).

To some developmentalists, the capacity of young children to engage in imitation suggests that imitation may be inborn. In support of this view, research has identified a class of neurons in the brain that seems to be related to an innate ability to imitate. *Mirror neurons* are neurons that fire not only when an individual enacts a particular behavior but also when the individual simply observes *another* organism carrying out the same behavior (Falck-Ytter, Gredebäck, & von Hofsten, 2006; Lepage & Théret, 2007; Paulus, 2014).

For example, research on brain functioning shows activation of the inferior frontal gyrus both when an individual carries out a particular task and when observing another individual carrying out the same task. Mirror neurons may help infants to understand others' actions and to develop a theory of mind. Dysfunction of mirror neurons may be related to the development of disorders involving children's theory of mind as well as autism, a psychological disorder involving significant emotional and linguistic problems (Kilner, Friston, & Frith, 2007; Martineau et al., 2008; Welsh et al., 2009).

The idea that through exposure to other children infants learn new behaviors, skills, and abilities has several implications. For one thing, it suggests that interactions between infants provide more than social benefits; they may have an impact on children's future cognitive development as well. Even more important, these findings illustrate that infants may benefit from participation in child-care centers (which we consider later in this chapter). Although we don't know for sure, the opportunity to learn from their peers may prove to be a lasting advantage for infants in group child-care settings.

Module 6.2 Review

- Attachment, the positive emotional bond between an infant and a significant individual, affects a person's later social competence as an adult.
- Secure attachment can occur between infants and their mothers, infants and their fathers, as well as between infants and other caregivers.
- Infants and the persons with whom they interact engage in reciprocal socialization as they mutually adjust to one another's interactions. Infants react differently to other children than to inanimate objects, and gradually they engage in increasing amounts of peer social interaction.

Journal Writing Prompt

Applying Lifespan Development: How does the communication between parent and infant affect the infant's attachment pattern to his or her parent?

Differences among Infants

Lincoln was a difficult baby, his parents both agreed. For one thing, it seemed like they could never get him to sleep at night. He cried at the slightest noise, a problem because his crib was near the windows facing a busy street. Worse yet, once he started crying, it seemed to take forever to calm him down again. One day his mother, Aisha, was telling her mother-in-law, Mary, about the challenges of being Lincoln's mom. Mary recalled that her own son, Lincoln's father Malcom, had been much the same way. "He was my first child,

and I thought this was how all babies acted. So, we just kept trying different ways until we found out how he worked. I remember, we put his crib all over the apartment until we finally found out where he could sleep, and it ended up being in the hallway for a long time. Then his sister, Maleah, came along, and she was so quiet and easy, I didn't know what to do with my extra time!"

As the story of Lincoln's family shows, babies are not all alike, and neither are their families. As we'll see, some of the differences among people seem to be present from the moment we are born. The differences among infants include overall personality and temperament, and differences in the lives they lead—differences based on their gender, the nature of their families, and the ways in which they are cared for.

Personality Development: The Characteristics That Make Infants Unique

LO 6.9 Describe individual differences that distinguish an infant's personality.

The origins of **personality**, the sum total of the enduring characteristics that differentiate one individual from another, stem from infancy. From birth onward, infants begin to show unique, stable traits and behaviors that ultimately lead to their development as distinct, special individuals (Caspi, 2000; Kagan, 2000; Shiner, Masten, & Roberts, 2003).

According to psychologist Erik Erikson, whose approach to personality development we first discussed in Chapter 1, infants' early experiences are responsible for shaping one of the key aspects of their personalities: whether they will be basically trusting or mistrustful.

Erikson's theory of psychosocial development considers how individuals come to understand themselves and the meaning of others'—and their own—behavior (Erikson, 1963). The theory suggests that developmental change occurs throughout people's lives in eight distinct stages, the first of which occurs in infancy.

According to Erikson, during the first 18 months of life, we pass through the **trust-versus-mistrust stage**. During this period, infants develop a sense of trust or mistrust, largely depending on how well their needs are met by their caregivers. In the previous example, Mary's attention to Malcom's needs probably helped him develop a basic sense of trust in the world. Erikson suggests that if infants are able to develop trust, they experience a sense of hope, which permits them to feel as if they can fulfill their needs successfully. On the other hand, feelings of mistrust lead infants to see the world as harsh and unfriendly, and they may have later difficulties in forming close bonds with others.

During the end of infancy, children enter the **autonomy-versus-shame-and-doubt stage**, which lasts from around 18 months to 3 years. During this period, children develop independence and autonomy if parents encourage exploration and freedom within safe boundaries. However, if children are restricted and overly protected, they feel shame, self-doubt, and unhappiness.

Erikson argues that personality is primarily shaped by infants' experiences. However, as we discuss next, other developmentalists concentrate on consistencies of behavior that are present at birth, even before the experiences of infancy. These consistencies are viewed largely as genetically determined and as providing the raw material of personality.

personality
the sum total of the enduring characteristics that differentiate one individual from another

Erikson's theory of psychosocial development
the theory that considers how individuals come to understand themselves and the meaning of others'—and their own—behavior

trust-versus-mistrust stage
according to Erikson, the period during which infants develop a sense of trust or mistrust, depending largely on how well their caregivers meet their needs

autonomy-versus-shame-and-doubt stage
the period during which, according to Erikson, toddlers (aged 18 months to 3 years) develop independence and autonomy if they are allowed the freedom to explore, or shame and self-doubt if they are restricted and overprotected

According to Erikson, children develop independence and autonomy if parents encourage exploration and freedom, within safe boundaries. What does Erikson theorize if children are restricted and overly protected at this stage?

Temperament: Stabilities in Infant Behavior

LO 6.10 Define temperament, and describe how it affects a child in the first two years of life.

Sarah's parents thought there must be something wrong. Unlike her older brother Josh, who had been so active as an infant that he seemed

Table 6-2 Some Dimensions of Temperament in Infants, with Behavioral Indicators

Dimension	Behavioral Indicators
Activity level	**High:** wriggles while diaper is changed **Low:** lies still while being dressed
Approach-withdrawal	**Approach orientation:** accepts novel foods and toys easily **Withdrawal orientation:** cries when a stranger comes near
Rhythmicity	**Regular:** has consistent feeding schedule **Irregular:** has varying sleep and waking schedule
Distractibility	**Low:** continues crying even when diaper is changed **High:** stops fussing when held and rocked
Quality of mood	**Negative:** cries when carriage is rocked **Positive:** smiles or smacks lips when tasting new food
Threshold of responsiveness	**High:** not startled by sudden noises or bright lights **Low:** pauses sucking on bottle at approach of parent or slight noise

(**Source:** Based on Thomas, Chess, & Birch, 1968.)

never to be still, Sarah was much more placid. She took long naps and was easily soothed on those relatively rare occasions when she became agitated. What could be producing her extreme calmness?

temperament
patterns of arousal and emotionality that are consistent and enduring characteristics of an individual

The most likely answer: The difference between Sarah and Josh reflected differences in temperament. As we first discussed in Chapter 2, **temperament** encompasses patterns of arousal and emotionality that are consistent and enduring characteristics of an individual (Kochanska & Aksan, 2004; Rothbart, 2007).

Temperament refers to *how* children behave, as opposed to *what* they do or *why* they do it. Infants show temperamental differences in general disposition from the time of birth, largely due at first to genetic factors, and temperament tends to be fairly stable well into adolescence. On the other hand, temperament is not fixed and unchangeable: Childrearing practices can modify temperament significantly. In fact, some children show little consistency in temperament from one age to another (Werner et al., 2007; de Lauzon-Guillain et al., 2012; Kusangi, Nakano, & Kondo-Ikemura, 2014).

Temperament is reflected in several dimensions of behavior. One central dimension is *activity level*, which reflects the degree of overall movement. Some babies (like Sarah) are relatively placid, and their movements are slow and almost leisurely. In contrast, the activity level of other infants (like Josh) is quite high, with strong, restless movements of the arms and legs.

Another important dimension of temperament is the nature and quality of an infant's mood, and in particular a child's *irritability*. Like Lincoln, who was described in the example at the beginning of this section, some infants are easily disturbed and cry easily, whereas others are relatively easygoing. Irritable infants fuss a great deal, and they are easily upset. They are also difficult to soothe when they do begin to cry. Such irritability is relatively stable: Infants who are irritable at birth remain irritable at the age of one, and even at age two they are still more easily upset than infants who were not irritable just after birth (Worobey & Bajda, 1989). (Other aspects of temperament are listed in Table 6-2.)

CATEGORIZING TEMPERAMENT: EASY, DIFFICULT, AND SLOW-TO-WARM BABIES. Because temperament can be viewed along so many dimensions, some researchers have asked whether broader categories can be used to describe children's overall behavior. According to Alexander Thomas and Stella Chess, who carried out a large-scale study of a group of infants that has come to be known as the *New York Longitudinal Study* (Thomas & Chess, 1980), babies can be described according to one of several profiles:

easy babies
babies who have a positive disposition; their body functions operate regularly, and they are adaptable

- ***Easy babies.*** **Easy babies** have a positive disposition. Their body functions operate regularly, and they are adaptable. They are generally positive, showing curiosity about new situations, and their emotions are moderate or low in intensity. This category applies to about 40 percent (the largest number) of infants.

- *Difficult babies.* **Difficult babies** have more negative moods and are slow to adapt to new situations. When confronted with a new situation, they tend to withdraw. About 10 percent of infants belong in this category.
- *Slow-to-warm babies.* **Slow-to-warm babies** are inactive, showing relatively calm reactions to their environment. Their moods are generally negative, and they withdraw from new situations, adapting slowly. Approximately 15 percent of infants are slow-to-warm.

As for the remaining 35 percent, they cannot be consistently categorized. These children show a variety of combinations of characteristics. For instance, one infant may have relatively sunny moods but react negatively to new situations, or another may show little stability of any sort in terms of general temperament.

WATCH THIS VIDEO ON MYPSYCHLAB
TEMPERAMENT

THE CONSEQUENCES OF TEMPERAMENT: DOES TEMPERAMENT MATTER? One obvious question to emerge from the findings of the relative stability of temperament is whether a particular kind of temperament is beneficial. The answer seems to be that no single type of temperament is invariably good or bad. Instead, children's long-term adjustment depends on the **goodness-of-fit** of their particular temperament and the nature and demands of the environment in which they find themselves. For instance, children with a low-activity level and low irritability may do particularly well in an environment in which they are left to explore on their own and are allowed largely to direct their own behavior. In contrast, high-activity-level, highly irritable children may do best with greater direction, which permits them to channel their energy in particular directions (Thomas & Chess, 1980; Strelau, 1998; Schoppe-Sullivan et al., 2007). Mary, the grandmother in the earlier example, found ways to adjust the environment for her son, Malcom. Malcolm and Aisha may need to do the same for their own son, Lincoln.

difficult babies
babies who have negative moods and are slow to adapt to new situations; when confronted with a new situation, they tend to withdraw

slow-to-warm babies
babies who are inactive, showing relatively calm reactions to their environment; their moods are generally negative, and they withdraw from new situations, adapting slowly

goodness-of-fit
the notion that development is dependent on the degree of match between children's temperament and the nature and demands of the environment in which they are being raised

Some research suggests that certain temperaments are, in general, more adaptive than others. For instance, difficult children, in general, are more likely to show behavior problems by school age than those classified in infancy as easy children. But not all difficult children experience problems. The key determinant seems to be the way parents react to their infants' difficult behavior. If they react by showing anger and inconsistency—responses that their child's difficult, demanding behavior readily evokes—then the child is ultimately more likely to experience behavior problems. On the other hand, parents who display more warmth and consistency in their responses are more likely to have children who avoid later problems (Thomas, Chess, & Birch, 1968; Salley, Miller, & Bell, 2013; Sayal et al., 2014).

Furthermore, temperament seems to be at least weakly related to infants' attachment to their adult caregivers. For example, infants vary considerably in how much emotion they display nonverbally. Some are "poker-faced," showing little expressivity, while others' reactions tend to be much more easily decoded. More expressive infants may provide more easily discernible cues to others, thereby easing the way for caregivers to be more successful in responding to their needs and facilitating attachment (Feldman & Rimé, 1991; Mertesacker, Bade, & Haverkock, 2004; Laible, Panfile, & Makariev, 2008).

Cultural differences also have a major influence on the consequences of a particular temperament. For instance, children who would be described as "difficult" in Western cultures actually seem to have an advantage in the East African Masai culture. The reason? Mothers offer their breast to their infants only when they fuss and cry; therefore, the irritable, more difficult infants are apt to receive more nourishment than the more placid, easy infants. Particularly when environmental conditions are bad, such as during a drought, difficult babies may have an advantage (de Vries, 1984; Gartstein et al., 2007; Gaias et al., 2012).

THE BIOLOGICAL BASIS OF TEMPERAMENT. Recent approaches to temperament grow out of the framework of behavioral genetics discussed in Chapter 2. From this perspective, temperamental characteristics are seen as inherited traits that are fairly stable

during childhood and across the entire life span. These traits are viewed as making up the core of personality and playing a substantial role in future development (Sheese et al., 2009).

Consider, for example, the trait of physiological reactivity, characterized by a high degree of motor and muscle activity in response to novel stimuli. This high reactivity, which has been termed *inhibition to the unfamiliar,* is exhibited as shyness.

A clear biological basis underlies inhibition to the unfamiliar, in which any novel stimulus produces a rapid increase in heartbeat, blood pressure, and pupil dilation, as well as excitability of the brain's limbic system. For example, people categorized as inhibited at two years of age show high reactivity in their brain's amygdala in adulthood when viewing unfamiliar faces. The shyness associated with this physiological pattern seems to continue through childhood and even into adulthood (Propper & Moore, 2006; Kagan et al., 2007; Anzman-Frasca et al., 2013).

High reactivity to unfamiliar situations in infants has also been linked to greater susceptibility to depression and anxiety disorders in adulthood. Furthermore, infants who are highly reactive develop anterior prefrontal cortexes that are thicker than those in less reactive children when they reach adulthood. Because the prefrontal cortex is closely linked to the amygdala (which controls emotional responses) and the hippocampus (which controls fear responses), the difference in prefrontal cortex may help explain the higher rates of depression and anxiety disorders (Schwartz & Rauch, 2004; Schwartz, 2008).

Gender: Boys in Blue, Girls in Pink

LO 6.11 Discuss how the gender of a child affects his or her development in the first two years of life.

"It's a boy." "It's a girl."

One of these two statements is probably the first announcement made after the birth of a child. From the moment of birth, girls and boys are treated differently. Their parents send out different kinds of birth announcements. They are dressed in different clothes and wrapped in different-colored blankets. They are given different toys (Bridges, 1993; Coltrane & Adams, 1997; Serbin, Poulin-Dubois, & Colburne, 2001).

Parents play with boy and girl babies differently: From birth on, fathers tend to interact more with sons than daughters, while mothers interact more with daughters. Because, as noted earlier in the chapter, mothers and fathers play in different ways (with fathers typically engaging in more physical, rough-and-tumble activities and mothers in traditional games, such as peek-a-boo), male and female infants are clearly exposed to different styles of activity and interaction from their parents (Clearfield & Nelson, 2006; Parke, 2007; Zosuls, Ruble, & Tamis-LeMonda, 2014).

The behavior exhibited by girls and boys is interpreted in very different ways by adults. For instance, when researchers showed adults a video of an infant whose name was given as either "John" or "Mary," adults perceived "John" as adventurous and inquisitive, while "Mary" was considered fearful and anxious, although it was the same baby performing a single set of behaviors (Condry & Condry, 1976). Clearly, adults view the behavior of children through the lens of gender. **Gender** refers to our sense of being male or female. The term *gender* is often used to mean the same thing as "sex," but they are not actually the same. *Sex* typically refers to sexual anatomy and sexual behavior, whereas gender refers to the social perceptions of maleness or femaleness. All cultures prescribe *gender roles* for males and females, but these roles differ greatly from one culture to another.

gender
the sense of being male or female

GENDER DIFFERENCES. There is a considerable amount of disagreement over both the extent and causes of such gender differences, even though most agree that boys and girls do experience at least partially different worlds based on gender. Some gender differences are fairly clear from the time of birth. For example, male infants tend to be more active and fussier than female infants. Boys' sleep tends to be more disturbed than that of girls.

Boys grimace more, although no gender difference exists in the overall amount of crying. There is also some evidence that male newborns are more irritable than female newborns, although the findings are inconsistent (Eaton & Enns, 1986; Guinsburg et al., 2000; Losonczy-Marshall, 2008).

Differences between male and female infants, however, are generally minor. In most ways, infants seem so similar that usually adults cannot discern whether a baby is a boy or girl, as the "John" and "Mary" video research shows. Furthermore, it is important to remember that there are much greater differences among individual boys and among individual girls than there are, on average, between boys and girls (Crawford & Unger, 2004).

GENDER ROLES. Gender differences emerge more clearly as children age—and become increasingly influenced by the gender roles that society sets out for them. For instance, by the age of one year, infants are able to distinguish between males and females. Girls at this age prefer to play with dolls or stuffed animals, while boys seek out blocks and trucks. Often, of course, these are the only options available to them, owing to the choices their parents and other adults have made in the toys they provide (Cherney, Kelly-Vance, & Glover, 2003; Alexander, Wilcox, & Woods, 2009).

Children's preferences for certain kinds of toys are reinforced by their parents. In general, however, parents of boys are more apt to be concerned about their child's choices than are parents of girls. Boys receive more reinforcement for playing with toys that society deems appropriate for boys, and this reinforcement increases with age. On the other hand, a girl playing with a truck is viewed with considerably less concern than a boy playing with a doll might be. Girls who play with toys seen by society as "masculine" are less discouraged for their behavior than boys who play with toys seen as "feminine" (Martin, Ruble, & Szkrybalo, 2002; Schmalz & Kerstetter, 2006; Hill & Flom, 2007).

By the time they reach the age of two, boys behave more independently and less compliantly than girls. Much of this behavior can be traced to parental reactions to earlier behavior. For instance, when a child takes his or her first steps, parents tend to react differently, depending on the child's gender: Boys are encouraged to go off and explore the world, while girls are hugged and kept close. It is hardly surprising, then, that by the age of two, girls tend to show less independence and greater compliance (Poulin-Dubois, Serbin, & Eichstedt, 2002).

Societal encouragement and reinforcement do not, however, completely explain differences in behavior between boys and girls. For example, as we'll discuss further in Chapter 8, one study examined girls who were exposed before birth to abnormally high levels of *androgen*, a male hormone, because their mothers unwittingly took a drug containing the hormone while pregnant. Later, these girls were more likely to play with toys stereotypically preferred by boys (such as cars) and less likely to play with toys stereotypically associated with girls (such as dolls). Although there are many alternative explanations for these results—you can probably think of several yourself—one possibility is that exposure to male hormones affected the brain development of the girls, leading them to favor toys that involve certain kinds of preferred skills (Mealey, 2000; Servin et al., 2003).

In sum, differences in behavior between boys and girls begin in infancy, and—as we will see in future chapters—continue throughout childhood (and beyond). Although gender differences have complex causes, representing some combination of innate, biologically related and

Parents of girls who play with toys related to activities associated with boys are apt to be less concerned than parents of boys who play with toys associated with girls.

environmental factors, they play a profound role in the social and emotional development of infants.

Family Life in the Twenty-First Century

LO 6.12 Describe twenty-first century families and their consequences for children.

A look back at television shows 50 years ago finds a world of families portrayed in a way that today seems oddly old-fashioned and quaint: mothers and fathers, married for years, and their good-looking children making their way in a world that seems to have few, if any, serious problems.

From *a social worker's* perspective

Imagine you are a social worker visiting a foster home. It is 11:00 A.M. You find the breakfast dishes in the sink and books and toys all over the floor. The infant you have placed in the home is happily pounding on pots and pans as his foster mother claps time. The kitchen floor is gooey under the baby's high chair. What is your assessment?

Even 50 years ago, such a view of family life was overly romantic and unrealistic. Today, however, it is broadly inaccurate, representing only a minority of families in the United States. A quick review tells the story:

- The number of single-parent families has increased significantly in the last three decades, as the number of two-parent households has declined. Currently, 64 percent of children ages 0–17 live with two married parents, down from 77 percent in 1980. Nearly a quarter of children live with only their mothers, four percent live with only their fathers, and four percent live with neither of their parents (Childstats.gov, 2013).
- The average size of families is shrinking. Today, on average, there are 2.5 persons per household, compared to 3.1 in 1970. The number of people living in nonfamily households (without any relatives) is more than 41 million (U.S. Census Bureau, 2013).
- Although the number of adolescents giving birth has declined substantially over the last five years, there are still nearly 96 thousand births to adolescent women aged 15 to 17, the vast majority of whom are unmarried (Childstats.gov, 2013).
- Fifty-seven percent of mothers of infants work outside the home (U.S. Bureau of Labor Statistics, 2013).
- In 2011, 45 percent of children under the age of 18 lived in low-income households, up from 40 percent in 2006. Nearly two-thirds of black children and Hispanic children live in low-income families (National Center for Children in Poverty, 2013).

The number of single-parent families has increased dramatically over the past 20 years. If the current trend continues, 60 percent of all children will live at some time with a single parent.

At the very least, these statistics suggest that many infants are being raised in environments in which substantial stressors are present. Such stress makes it an unusually difficult task to raise children—which is never easy even under the best circumstances.

At the same time, society is adapting to the new realities of family life in the twenty-first century. Several kinds of social support exist for the parents of infants, and society is evolving new institutions to help in their care. One example is the growing array of child-care arrangements available to help working parents, as we discuss next.

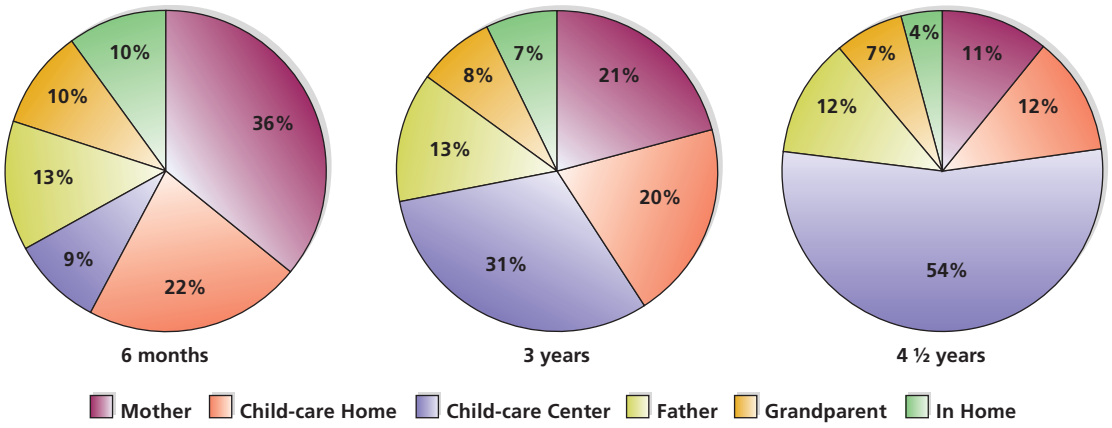
How Does Infant Child Care Affect Later Development?

LO 6.13 Summarize how nonparental child care affects infants.

For most of the years my two kids were in child care, I worried about it. Did that weird day-care home where my daughter stayed briefly as a toddler do irreparable harm? Was my son irretrievably damaged by that child-care center he disliked? (Shellenbarger, 2003, p. D1)

Figure 6-6 Where Are Children Cared For?

According to a major study by the National Institute of Child Health and Human Development (NICHD), children spend more time in some kind of child care outside the home or family as they get older.
(**Source:** NICHD Early Child Care Research Network, 2006a.)



Every day, parents ask themselves questions like these. The issue of how infant child care affects later development is a pressing one for many parents, who, because of economic, family, or career demands, leave their children to the care of others for a portion of the day. Almost two-thirds of all children between four months and three years of age now spend time in nonparental child care. Overall, more than 80 percent of infants are cared for regularly by people other than their mothers at some point during their first year of life. The majority of these infants begin child care outside the home before the age of four months and are enrolled for almost 30 hours per week (Federal Interagency Forum on Child and Family Statistics, 2003; NICHD Early Child Care Research Network, 2006a; also see Figure 6-6). What effects do such arrangements have on later development?

Although the answer is largely reassuring, the newest research to come from the massive, long-term Study of Early Child Care and Youth Development, the longest-running examination of child care ever conducted, suggests that long-term participation in day care may have unanticipated consequences.

First the good news: According to most of the evidence, high-quality child care outside the home produces only minor differences from home care in most respects, and may even enhance certain aspects of development. For example, research finds little or no difference in the strength or nature of parental attachment bonds of infants who have been in high-quality child care compared with infants raised solely by their parents (NICHD Early Child Care Research Network, 1999, 2001; Vandell et al., 2005; Sosinsky & Kim, 2013; Ruzek et al., 2014).

In addition to the direct benefits from involvement in child care outside the home, there are indirect benefits. For example, children in lower-income households and those whose mothers are single may benefit from the educational and social experiences in child care, as well as from the higher income produced by parental employment (NICHD Early Child Care Research Network, 2003a; Dearing, McCartney, & Taylor, 2009).

Furthermore, children who participate in Early Head Start—a program that serves at-risk infants and toddlers in high-quality child-care centers—can solve problems better, pay greater attention to others, and use language more effectively than poor children who do not participate in the program. In addition, their parents (who are also involved in the program) benefit from their participation. Participating parents talk and read more to their children, and they are less likely to spank them. Moreover, children who receive

High-quality infant child care seems to produce only minor differences from home care in most respects, and some aspects of development may even be enhanced. What aspects of development might be enhanced by participation in infant child care outside the home?

good, responsive child care are more likely to play well with other children (NICHD Early Child Care Research Network, 2001b; Maccoby & Lewis, 2003; Loeb et al., 2004; Raikes et al., 2014).

On the other hand, some of the findings on participation in child care outside the home are less positive. Infants may be somewhat less secure when they are placed in low-quality child care, if they are placed in multiple child-care arrangements, or if their mothers are relatively insensitive and unresponsive. Also, children who spend long hours in outside-the-home child-care situations have a lower ability to work independently and have less effective time management skills (Vandell et al., 2005).

The newest research, which focuses on preschoolers, finds that children who spend 10 or more hours a week in group child care for a year or more are more likely to be disruptive in class, and that the effect continues through the sixth grade. Although the increased likelihood of disruptive activity is not substantial—every year spent in a child-care center resulted in a one percent higher score on a standardized measure of problem behavior completed by teachers—the results were quite reliable (Belsky et al., 2007).

In sum, the ballooning body of research finds that the effects of participation in group child care are neither unambiguously positive nor unambiguously negative. What is clear, however, is that the *quality* of child care is critical. Ultimately to fully understand the consequences of child care, more research is needed on just who makes use of it and how members of different segments of society use it (Marshall, 2004; NICHD Early Child Care Research Network, 2005; Belsky, 2006; de Schipper et al., 2006; Belsky, 2009; also see the *Are You an Informed Consumer of Development?* feature on choosing the right infant care provider).

Are You an Informed Consumer of Development?

Choosing the Right Infant Care Provider

One finding that emerges with absolute clarity from research conducted on the consequences of infant child-care programs is that the benefits of child care—peer learning, greater social skills, greater independence—occur only when child care is of high quality. But what distinguishes high-quality child care from low-caliber programs? Parents should consider the following questions when they are choosing a program (Committee on Children, Youth and Families, 1994; Love et al., 2003; de Schipper et al., 2006):

- Are there enough providers? A desirable ratio is one adult for every three infants, although one to four can be adequate.
- Are group sizes manageable? Even with several providers, a group of infants should not be larger than eight.
- Has the center complied with all governmental regulations, and is it licensed?
- Do the people providing the care seem to like what they are doing? What is their motivation? Is child care just a temporary job, or is it a career? Are they experienced? Do they seem happy in the job, or is offering child care just a way to earn money?
- What do the caregivers do during the day? Do they spend their time playing with, listening and talking to, and paying attention to the children? Do they seem genuinely interested in the children, rather than merely going through the motions of caring for them? Is there a television constantly on?
- Are the children safe and clean? Does the environment allow infants to move around safely? Are the equipment and furniture in good repair? Do the providers adhere to the highest levels of cleanliness? After changing a baby's diaper, do providers wash their hands?

- What training do the providers have in caring for children? Do they demonstrate a knowledge of the basics of infant development and an understanding of how normal children develop? Do they seem alert to signs that development may depart from normal patterns?
- Finally, is the environment happy and cheerful? Is the child care more than just a babysitting service when you consider that for the time an infant is there, it is the child's whole world? You should feel fully comfortable and confident that the child-care center is a place where your infant will be treated as an individual.

In addition to following these guidelines, you may contact the National Association for the Education of Young Children (NAEYC), from which you can get the name of a resource and referral agency in your area. Go to the NAEYC website at www.naeyc.org or call (800) 424–2460.

Module 6.3 Review

- According to Erikson, during infancy, individuals move from the trust-versus-mistrust stage of psychosocial development to the autonomy-versus-shame-and-guilt stage.
- Temperament encompasses enduring levels of arousal and emotionality that are characteristic of an individual.
- Gender differences become more pronounced as infants age.
- The varieties of families, ranging from traditional two-parent to blended to same-sex couples, mirrors the complexity of modern-day society.
- Child care outside of the home can have neutral, positive, or negative effects on the social development of children, depending largely on its quality. Research on the effects of child care must take into account the varying quality of different child-care settings and the social characteristics of the parents who tend to use child care.

Journal Writing Prompt

Applying Lifespan Development: How could an infant's temperament (as described by Thomas and Chess) be an advantage in one environment and a disadvantage in a different environment?

Epilogue

The road infants travel as they develop as social individuals is a long and winding one. We saw in this chapter that infants begin decoding and encoding emotions early, using social referencing and eventually developing a "theory of mind." We also considered how the attachment patterns that infants display can have long-term effects, influencing even what kind of parent the child eventually becomes. In addition to examining Erik Erikson's theory of psychosocial development, we also discussed temperament and explored the nature and causes of gender differences. We concluded with a discussion of infant child-care options.

Return to the prologue of this chapter, which describes Chantelle Evans, the 10-month-old girl who sobbed for two hours when her mother left her with a neighbor, and answer the following questions.

1. Do you think Chantelle is experiencing stranger anxiety, separation anxiety, or both? How would you explain to her mother that this indicates a positive, healthy development?
2. How might Chantelle's lack of self-awareness be related to her anxiety at her mother's absence?
3. Are Chantelle's red face and tears indications that she is experiencing emotions—genuine feelings of distress and grief? Explain your thinking.
4. Using what you know about social referencing in infants of Chantelle's age, what advice could you give to Michelle that might help her ease her daughter's transition to the neighbor's care?

Looking Back

LO 6.1 Discuss how children express and experience emotions in the first two years of life.

Infants display a variety of facial expressions, which are similar across cultures and appear to reflect basic emotional states.

LO 6.2 Differentiate stranger anxiety from separation anxiety.

By the end of the first year, infants often develop both stranger anxiety—wariness around an unknown person—and

separation anxiety—distress displayed when a customary care provider departs.

LO 6.3 Discuss the development of social referencing and nonverbal decoding abilities.

Through social referencing, infants from the age of eight or nine months use the expressions of others to clarify ambiguous situations and learn appropriate reactions to them. Early in life, infants develop the capability of nonverbal decoding: determining the emotional states of others based on their facial and vocal expressions.

LO 6.4 Describe the sense of self that children possess in the first two years of life.

Infants begin to develop self-awareness at about the age of 12 months.

LO 6.5 Summarize the theory of mind and evidence of infants' growing sense of mental activity by the age of two.

Infants also begin to develop a theory of mind at this time: knowledge and beliefs about how they and others think.

LO 6.6 Explain attachment in infancy and how it affects a person's future social competence.

Attachment, a strong, positive emotional bond that forms between an infant and one or more significant persons, is a crucial factor in enabling individuals to develop social relationships.

Infants display one of four major attachment patterns: securely attached, avoidant, ambivalent, and disorganized-disoriented. Research suggests an association between an infant's attachment pattern and his or her social and emotional competence as an adult.

LO 6.7 Describe the roles that caregivers play in infants' social development.

Mothers' interactions with their babies are particularly important for social development. Mothers who respond effectively to their babies' social overtures appear to contribute to the babies' ability to become securely attached.

LO 6.8 Discuss the development of relationships in infancy.

Through a process of reciprocal socialization, infants and caregivers interact and affect one another's behavior, which strengthens their mutual relationship. From an early age, infants engage in rudimentary forms of social interaction with other children, and their level of sociability rises as they age.

LO 6.9 Describe individual differences that distinguish an infant's personality.

The origins of personality, the sum total of the enduring characteristics that differentiate one individual from another, arise during infancy.

LO 6.10 Define temperament, and describe how it affects a child in the first two years of life.

Temperament encompasses enduring levels of arousal and emotionality that are characteristic of an individual. Temperamental differences underlie the broad classification of infants into easy, difficult, and slow-to-warm categories.

LO 6.11 Discuss how the gender of a child affects his or her development in the first two years of life.

As infants age, gender differences become more pronounced, mostly due to environmental influences. Differences are accentuated by parental expectations and behavior.

LO 6.12 Describe twenty-first century families and their consequences for children.

The varieties of families, ranging from traditional two-parent to blended to same-sex couples, mirrors the complexity of modern-day society.

LO 6.13 Summarize how nonparental child care affects infants.

Child care, a societal response to the changing nature of the family, can be beneficial to the social development of children, fostering social interaction and cooperation, if it is of high quality.

Key Terms and Concepts

stranger anxiety 200
separation anxiety 200
social smile 200
social referencing 201
self-awareness 203
theory of mind 204
empathy 204
attachment 206
Ainsworth Strange Situation 207
secure attachment pattern 207
avoidant attachment pattern 207
ambivalent attachment pattern 208
disorganized-disoriented attachment pattern 208
mutual regulation model 212
reciprocal socialization 212
personality 215
Erikson's theory of psychosocial development 215
trust-versus-mistrust stage 215
autonomy-versus-shame-and-doubt stage 215
temperament 216
easy babies 216
difficult babies 217
slow-to-warm babies 217
goodness-of-fit 217
gender 218

SUMMARY

2 Putting It All Together

Infancy

FOUR-MONTH-OLD ALEX was a model infant in almost every respect. However, there was one aspect of his behavior that posed a dilemma: how to respond when he woke up in the middle of the night and cried despondently. It usually was not a matter of being hungry, because typically he had been fed recently. And it was not caused by his diaper being soiled, because usually that had been changed recently. Instead, it seemed that Alex just wanted to be held and entertained, and when he wasn't, he cried and shrieked dramatically until someone came to him.

WHAT WOULD YOU DO?

■ How would you deal with Alex? What factors would affect your decision? Based on your reading, how do you think Alex will respond?

What's your response?

WHAT WOULD A PARENT DO?

■ What strategies would you use in dealing with Alex? Would you go to him every time he cried? Or, would you try to wait him out, perhaps setting a time limit before going to him?

What's your response?

Physical Development

- Alex's body is developing various rhythms (repetitive, cyclical patterns of behavior) that are responsible for the change from sleep to wakefulness.
- Alex will sleep in spurts of around 2 hours, followed by periods of wakefulness until about 16 weeks, when he will begin to sleep as much as 6 continuous hours.
- Since Alex's sense of touch is one of his most highly developed senses (and one of the earliest developed), Alex will respond to gentle touches, such as a soothing caress, which can calm a crying, fussy infant.

Cognitive Development

- Alex has learned that his behavior (crying) can produce a desired effect (someone holding and entertaining him).
- As Alex's brain develops, he is able to separate people he knows from people he doesn't; this is why he responds so positively when someone he knows comes to comfort him during the night.

Social and Personality Development

- Alex has developed attachment (the positive emotional bond between him and particular individuals) to those who care for him.
- In order to feel secure, Alex needs to know that his caregivers will provide an appropriate response to the signals he is sending.
- Part of Alex's temperament is that he is irritable. Irritable infants can be fussy and are difficult to soothe when they do begin to cry.
- Since irritability is relatively stable, Alex will continue to display this temperament at age 1 and even age 2.

WHAT WOULD A NURSE DO?

■ How would you recommend that Alex's caregivers deal with the situation? Are there any dangers that the caregivers should be aware of?

What's your response?

WHAT WOULD AN EDUCATOR DO?

■ Suppose Alex spends a few hours every weekday afternoon in day care. If you were a child-care provider, how would you deal with Alex if he wakes up from naps soon after falling asleep?

What's your response?

Chapter 7

Physical and Cognitive Development in the Preschool Years

Learning Objectives

LO 7.1 Describe a child's bodily growth and overall health risks during the preschool years.

LO 7.2 Summarize how preschool children's brains develop.

LO 7.3 Explain how preschool children's motor skills develop.

LO 7.4 Summarize how Piaget explains cognitive development during the preschool years.

LO 7.5 Summarize the information-processing approaches to cognitive development in the preschool years.

LO 7.6 Describe Vygotsky's view of cognitive development in the preschool years.

LO 7.7 Explain how children's language develops in the preschool years.

LO 7.8 Summarize the effects television and other media have on preschoolers.

LO 7.9 Distinguish the typical educational programs available to children in the preschool years.

Chapter Overview

Prologue: The Field Trip

The children in Corinne Green's preschool class are going on a field trip to a farm. It's all Green can do to keep the more excitable members of her class from running up and down the aisle of the bus or jumping on the seats. To focus the group, she leads them in a series of familiar classroom games. First, she claps out various rhythms, and the children try to copy each one. When they tire of this, she engages them in a round of "I spy," choosing objects everyone can see. Then she leads them in songs that include hand motions, such as "The Itsy Bitsy Spider."

Not all of Green's young charges need to be settled. Four-year-old Danny Brock is busy drawing cows, horses, and pigs. His sketches are simple, but they are easily recognizable as the animals he expects to see on the farm. Su-Yun Davis is telling the girl next to her about barns, tractors, and henhouses. Su-Yun is using what she remembers from a farm she visited with her parents four months earlier. Megan Haas is very quietly eating the lunch she brought, one potato chip at a time, a good two hours before her teacher will announce lunchtime. "There's never a dull moment with preschoolers," Green says. "They're always doing something. And in a class of twenty, it's often twenty different somethings." ■

Looking Ahead

The children in Corinne Green's preschool class, running and clapping their hands in imitative rhythms, were infants not so long ago. The rapid advances in mobility of the preschool years are challenging to parents, who must rise to a whole new level of vigilance in order to prevent injuries. But the physical development that children undergo at this age results in more than leaping and climbing. It also enables Danny Brock to produce recognizable objects in his drawings and Su-Yun Davis to remember the details of moments that occurred months before.

The preschool period, which extends from the end of infancy, at about the age of two, to around age six, is an exciting time in children's lives. In one sense, the preschool years mark a time of preparation: a period spent anticipating and getting ready for the start of a child's formal education, through which society will begin the process of passing on its intellectual tools to a new generation.

But it is a mistake to take the label "preschool" too literally. The years between three and six are hardly a mere way station in life, an interval spent waiting for the next, more important period to start. Instead, the preschool years are a time of tremendous change and growth, where physical, intellectual, and social development proceeds at a rapid pace.

In this chapter, we focus on the physical, cognitive, and linguistic growth that occurs during the preschool years. We begin by considering the physical changes children undergo during those years. We discuss weight and height, nutrition, and health and wellness. The brain and its neural pathways change too, and we will touch on some intriguing findings relating to gender differences in the way that the brain functions. We also look at how both gross and fine motor skills change over the preschool years.

Intellectual development is the focus of much of the remainder of the chapter. We examine the major approaches to cognitive development, including the next stages of Piaget's theory, information processing approaches, and a view of cognitive development as heavily influenced by culture.

Finally, the chapter considers the important advances in language development that occur during the preschool years. We end with a discussion of several factors that influence cognitive development, including exposure to television and participation in childcare and preschool programs.

Physical Growth

The advances in physical abilities that occur during the preschool period are nothing short of astounding. Just how far children develop is apparent when we look at the specific changes they have undergone in their size, shape, and physical abilities.

The Growing Body

LO 7.1 Describe a child's bodily growth and overall health risks during the preschool years.

By age two, the average child in the United States weighs around 25 to 30 pounds and is close to 36 inches tall—around half the height of the average adult. Children grow steadily during the preschool period, and by the time they are 6 years old, they weigh, on average, about 46 pounds and stand 46 inches tall (see Figure 7-1).

INDIVIDUAL DIFFERENCES IN HEIGHT AND WEIGHT. The averages in Figure 7-1 mask great individual differences in height and weight. For instance, 10 percent of six-year-olds weigh 55 pounds or more, and 10 percent weigh 36 pounds or less. Furthermore, average differences in height and weight between boys and girls increase during the preschool years. Although at age two the differences are relatively small, during the preschool years, boys start becoming taller and heavier, on average, than girls.

Global economics also affect these averages. There are profound differences in height and weight between children in economically developed countries and those in developing countries. The better nutrition and health care received by children in developed countries translates into significant differences in growth. For instance, the average Swedish four-year-old is as tall as the average six-year-old in Bangladesh (United Nations, 1991; Leathers & Foster, 2004).

Differences in height and weight reflect economic factors within the United States as well. For instance, children in families whose incomes are below the poverty level are far more likely to be unusually short than children raised in more affluent homes (Barrett & Frank, 1987; Ogden et al., 2002).

CHANGES IN BODY SHAPE AND STRUCTURE. If we compare the bodies of a two-year-old and a six-year-old, we find that the bodies vary not only in height and weight,

but also in shape. During the preschool years, boys and girls begin to burn off some of the fat they have carried from their infancy, and they no longer have a pot-bellied appearance. They become less round and chubby and more slender. Moreover, their arms and legs lengthen, and the size relationship between the head and the rest of the body becomes more adultlike. In fact, by the time children reach six years of age, their proportions are quite similar to those of adults.

Other physical changes are occurring internally. Muscle size increases, and children grow stronger. Bones become sturdier. The sense organs continue to develop. For instance, the *eustachian tube* in the ear, which carries sounds from the external part of the ear to the internal part, moves from a position that is almost parallel to the ground at birth to a more angular position. This change sometimes leads to an increase in the frequency of earaches during the preschool years.

NUTRITION: EATING THE RIGHT FOODS. Because the rate of growth during this period is slower than during infancy, preschoolers need less food to maintain their growth. The change in food consumption may be so noticeable that parents sometimes worry that their preschooler is not eating enough. However, children tend to be quite adept at maintaining an appropriate intake of food if provided with nutritious meals. In fact, anxiously encouraging children to eat more than they seem to want naturally may lead them to increase their food intake beyond an appropriate level.

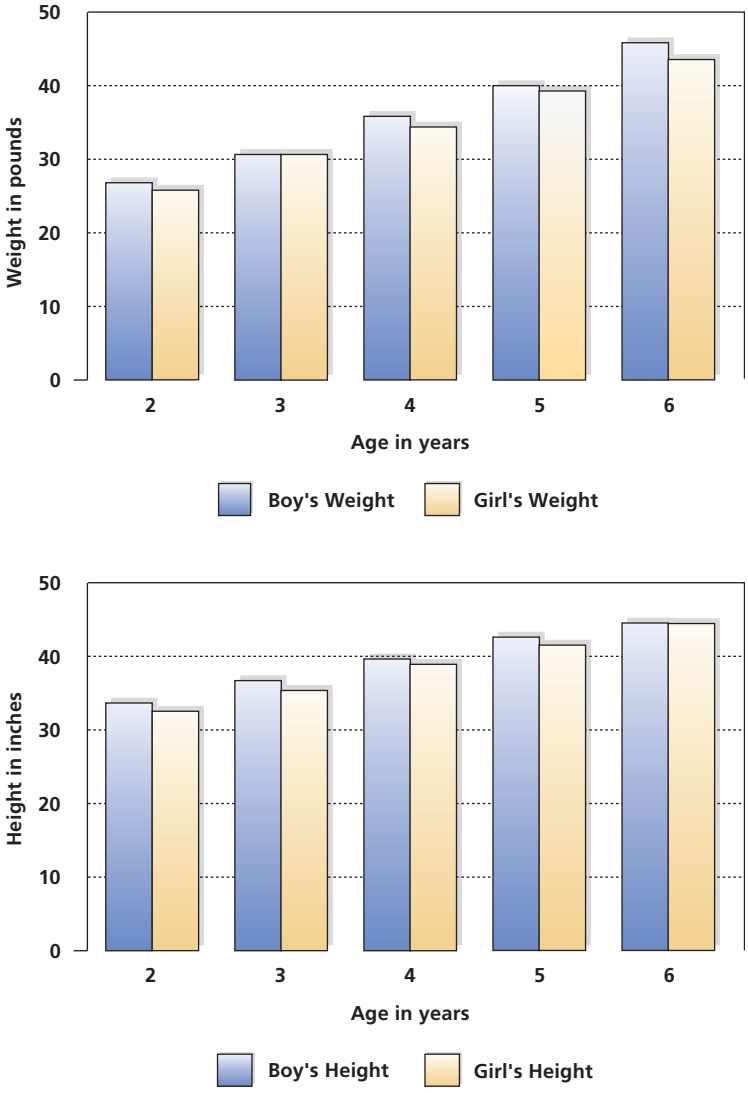
Ultimately, some children's food consumption can become so high as to lead to **obesity**, which is defined as a body weight more than 20 percent higher than the average weight for a person of a given age and height. The prevalence of obesity among older preschoolers increased significantly through the 1980s and 1990s. However, research released in 2014 found that the incidence of obesity declined over the prior 10 years from nearly 14 percent to just over 8 percent—a significant breakthrough in children's health (Robertson et al., 2012; Tavernise, 2014; Miller & Brooks-Gunn, 2015).

How do parents ensure that their children have good nutrition without turning mealtimes into a tense, adversarial situation? In most cases, the best strategy is to make sure that a variety of foods low in fat and high in nutritional content is available. Foods that have a relatively high iron content are particularly important: Iron-deficiency anemia, which causes constant fatigue, is one of the prevalent nutritional problems in developed countries such as the United States. High-iron foods include dark green vegetables (such as broccoli), whole grains, and some kinds of meat, such as lean hamburger. It is also important to avoid foods with high sodium content and to include foods with low fat content (Brotanek et al., 2007; Grant et al., 2007; Jalonick, 2011).

Because preschool children, like adults, will not find all foods equally appealing, children should be given the opportunity to develop their own natural preferences. As long as their overall diet is adequate, no single food is indispensable. Exposing children to a

Figure 7-1 Gaining Height and Weight

The preschool years are marked by steady increases in height and weight. The figures show the median point for boys and girls at each age, in which 50 percent of children in each category are above this height or weight level and 50 percent are below.



(**Source:** National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion, 2000.)

obesity
body weight more than 20 percent higher than the average weight for a person of a given age and height

Encouraging children to eat more than they seem to want naturally may lead them to increase their food intake beyond an appropriate level.

wide variety of foods by encouraging them to take just one bite of new foods is a relatively low-stress way of expanding children's diets (Busick et al., 2008; Struempler et al., 2014).

From *a health-care worker's* perspective

How might biology and environment combine to affect the physical growth of a child adopted as an infant from a developing country and reared in a more industrialized one?

HEALTH AND ILLNESS. The average preschooler has 7 to 10 colds and other minor respiratory illnesses in each of the years from age 3 to 5. In the United States, a runny nose due to the common cold is the most frequent—and happily, the least severe—kind of health problem during the preschool years. The majority of children in the United States are reasonably healthy during this period (Kalb, 1997).

Although the sniffles and coughs that are the symptoms of such illnesses are certainly distressing to children, the unpleasantness is usually not too severe, and the illnesses usually last only a few days. What's more, such minor illnesses may offer some unexpected benefits: Not only may they help children build up immunity to more severe illnesses to which they may be exposed in the future, but they also may provide some emotional benefits. Specifically, some researchers argue that minor illness permits children to understand their bodies better. It also may permit them to learn coping skills that will help them deal more effectively with future, more severe diseases. Furthermore, it gives them the ability to understand better what others who are sick are going through. This ability to put oneself in another's shoes, known as *empathy*, may teach children to be more sympathetic and better caretakers (Notaro, Gelman, & Zimmerman, 2002; Raman & Winer, 2002; Williams & Binnie, 2002).

Although physical illness is typically a minor problem during the preschool years, an increasing number of children are being treated with drugs for psychological disorders, such as depression, formally known as *depressive disorders* (see Figure 7-2). For example, it is now believed that depression affects around 4 percent of preschoolers in the United States, and the rate of diagnosis has increased significantly. Other difficulties include phobias, anxiety disorders, and behavioral disorders. In addition, the use of drugs such as antidepressants and stimulants has grown significantly Although it is not clear why the increase has occurred, some experts believe that parents and preschool teachers may be seeking a quick fix for behavior problems that may simply represent normal difficulties (Colino, 2002; Zito, 2002; Mitchell et al., 2008; Pozzi-Monzo, 2012; Muller, 2013).

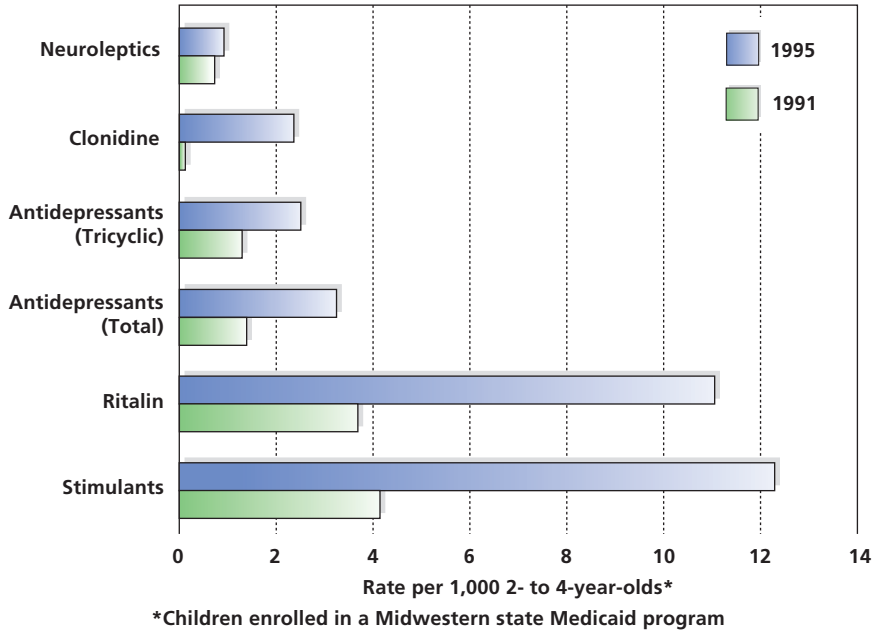
INJURIES DURING THE PRESCHOOL YEARS: PLAYING IT SAFE. The greatest risk that preschoolers face comes from neither illness nor nutritional problems but from accidents: Before the age of 10, children have twice the likelihood of dying from an injury than from an illness. Children in the United States have a one in three chance every year of receiving an injury that requires medical attention (Field & Behrman, 2003; National Safety Council, 2013).

The danger of injuries during the preschool years is in part a result of the children's high levels of physical activity. A three-year-old might think that it is perfectly reasonable to climb on an unsteady chair to get something that is out of reach, and a four-year-old might enjoy holding on to a low tree branch and swinging her legs up and down. It is this physical activity, in combination with the curiosity and lack of judgment that also characterize this age group, that makes preschoolers so accident-prone.

Furthermore, some children are more apt to take risks than others, and such preschoolers are more likely to be injured than their more cautious peers. Boys, who are often more active than girls and tend to take more risks, have a higher rate of injuries. Ethnic differences, probably due to differences in cultural norms about how closely children need to be supervised,

Figure 7-2 Numbers of Preschool Children Taking Medication for Behavioral Problems

Although there is no clear explanation as to why the use of stimulants and antidepressants has increased among children, some experts believe that medication is a quick-fix solution for behavior problems that are actually normal difficulties.



(**Source:** Zito et al., 2000.)

can also be seen in accident rates. Asian American children in the United States, who tend to be supervised with particular strictness by their parents, have one of the lowest accident rates for children. Economic factors also play a role. Children raised under conditions of poverty in urban areas, whose inner-city neighborhoods may contain more hazards than more affluent areas, are two times more likely to die of injuries than children living in affluence (Morrongiello et al., 2006; Morrongiello, Klemencic, & Corbett, 2008; Sengoelge et al., 2014).

The range of dangers that preschoolers face is wide. Injuries come from falls, burns from stoves and fires, drowning in bathtubs indoors and standing water outdoors, and suffocation in places such as abandoned refrigerators. Auto accidents also account for a large number of injuries. Finally, children face injuries from poisonous substances, such as household cleaners.

Parents and caregivers of preschoolers can take several precautions to prevent injuries, although none of these measures eliminates the need for close supervision. Caregivers can start by "childproofing" preschoolers' homes and classrooms, placing covers on electrical outlets and child locks on cabinets where poisons are kept, for example. Child car seats and bike helmets can help prevent injuries in case of accidents. Parents and teachers also need to be aware of the dangers from long-term hazards, such as lead poisoning (Bull & Durbin, 2008; Morrongiello, Corbett, & Bellissimo, 2008; Morrongiello et al., 2009).

The danger of injuries during the preschool years is in part a result of children's high levels of physical activity. It is important to take protective measures to reduce the hazards.

THE SILENT DANGER: LEAD POISONING IN YOUNG CHILDREN.

At the age of three, Tory couldn't sit still. He was unable to watch a television show for more than 5 minutes, and sitting still while his mother read to him was impossible. He was often irritable, and he impulsively took risks when he was playing with other children. When his behavior reached a point where his parents thought there was something seriously wrong with him, they took him to a pediatrician for a physical examination. After testing Tory's blood, the pediatrician found that his parents were right: Tory was suffering from lead poisoning.

The urban environment in which poor children often live makes them especially susceptible to lead poisoning.

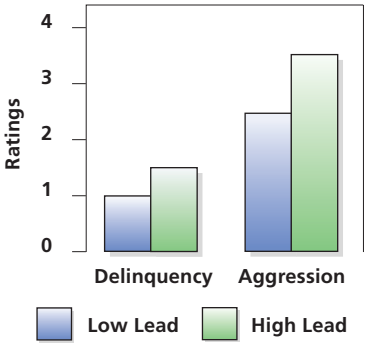
Some 14 million children are at risk for lead poisoning due to exposure to potentially toxic levels of lead, according to the Centers for Disease Control. Although there are now stringent legal restrictions on the amount of lead in paint and gasoline, lead is still found on painted walls and window frames—particularly in older homes—and in gasoline, ceramics, lead-soldered pipes, and even dust and water. People who live in areas of substantial air pollution due to automobile and truck traffic may also be exposed to high levels of lead (Hubbs-Tait et al., 2005; Fiedler, 2012; Herendeen & MacDonald, 2014).

Even tiny amounts of lead can permanently harm children. Exposure to lead has been linked to lower intelligence, problems in verbal and auditory processing, and—as in the case of Tory—hyperactivity and distractibility. High lead levels have also been linked to higher levels of antisocial behavior, including aggression and delinquency, in school-age children (see Figure 7-3). At yet higher levels of exposure, lead poisoning results in illness and death (Fraser, Muckle, & Després, 2006; Kincl, Dietrich, & Bhattacharya, 2006; Nigg et al., 2008).

Poor children are particularly susceptible to lead poisoning, and the results of poisoning tend to be worse for them than for children from more affluent families. Children living in poverty are more apt to reside in housing that contains peeling and chipping lead paint, or to live near heavily trafficked urban areas with high levels of air pollution. At the same time, many families living in poverty may be less stable and unable to provide consistent opportunities for intellectual stimulation that might serve to offset some of the cognitive problems caused by the poisoning. Consequently, lead poisoning is especially harmful to poorer children (Duncan & Brooks-Gunn, 2000; Dilworth-Bart & Moore, 2006; Polivka, 2006; also see the *Are You an Informed Consumer of Development?* feature).

Figure 7-3 The Consequence of Lead Poisoning

High levels of lead have been linked to higher levels of antisocial behavior, including aggression and delinquency, in school-age children.



(**Source:** Needleman et al., 1996.)

myelin

protective insulation that surrounds parts of neurons

The Growing Brain

LO 7.2 Summarize how preschool children's brains develop.

The brain grows at a faster rate than any other part of the body. Two-year-olds have brains that are about three-quarters of the size and weight of an adult brain. By age five, children's brains weigh 90 percent of average adult brain weight. In comparison, the average five-year-old's total body weight is just 30 percent of average adult body weight (Lowrey, 1986; Nihart, 1993; House, 2007).

Why does the brain grow so rapidly? One reason is an increase in the number of interconnections among cells, as we saw in Chapter 4. These interconnections allow for more complex communication between neurons, and they permit the rapid growth of cognitive skills that we'll discuss later in the chapter. In addition, the amount of **myelin**—protective insulation that surrounds parts of neurons—increases, which speeds the transmission of electrical impulses along brain cells but also adds to brain weight. This rapid brain growth not only allows for increased cognitive abilities but also helps in the development of more sophisticated fine and gross motor skills (Dalton & Bergenn, 2007; Klingberg & Betteridge, 2013; Dean et al., 2014).

By the end of the preschool period, some parts of the brain have undergone particularly significant growth. For example, the *corpus callosum*, a bundle of nerve fibers that connects the two hemispheres of the brain, becomes considerably thicker, developing as many as 800 million individual fibers that help coordinate brain functioning between the two hemispheres.

In contrast, children who are malnourished show delays in brain development. For example, severely malnourished children develop less myelinization protecting their neurons (Hazin, Alves, & Rodrigues Falbo, 2007).

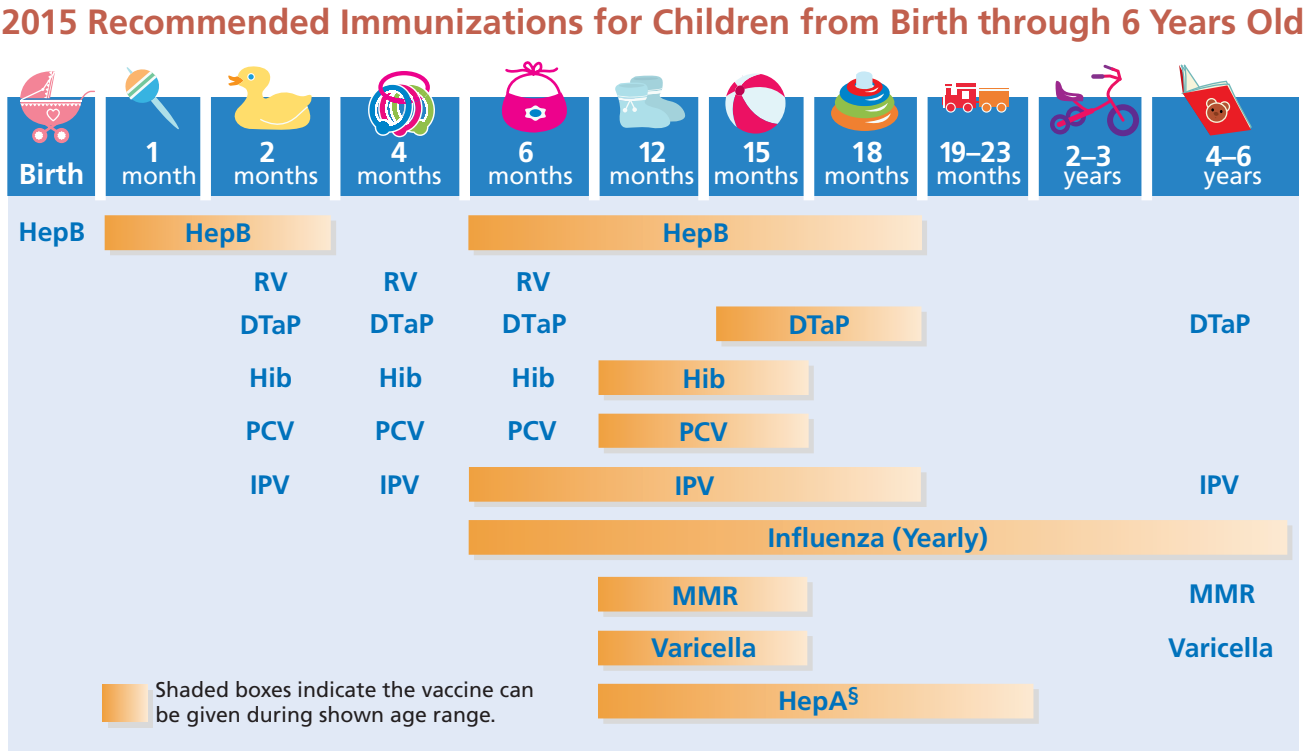
Are You an Informed Consumer of Development?

Keeping Preschoolers Healthy

There is no way around it: Even the healthiest preschooler occasionally gets sick. Social interaction with others ensures that illnesses will be passed from one child to another. However, some diseases are preventable, and others can be minimized if simple precautions are taken:

- Preschoolers should eat a well-balanced diet containing the proper nutrients, particularly foods containing sufficient protein. (The recommended energy intake for children at age 24 months is about 1,300 calories a day, and for those aged 4 to 6, it is around 1,700 calories a day.) Although some fruit juice, such as a glass of orange juice with breakfast, is fine, generally juice has so much sugar that it should be avoided. In addition, keep offering healthy foods, even if children initially reject them; they may grow to like them.
- Preschoolers should be encouraged to exercise. Children who exercise are less likely to become obese than those who are sedentary.
- Children should get as much sleep as they wish. Being run-down from lack of either nutrition or sleep makes children more susceptible to illness.
- Children should avoid contact with others who are ill. Parents should make sure that children wash their hands after playing with other kids who are obviously sick (as well as emphasizing the importance of hand-washing generally).
- Children should be placed on an appropriate schedule of immunizations. As illustrated in Figure 7-4, current recommendations state that a child should have received nine different vaccines and other preventive medicines in five to seven separate visits to the doctor. Despite the beliefs of some parents, there is no scientific basis for believing that common vaccinations should be avoided because they can increase the risk of autism. *Children should receive the recommended vaccinations outlined in the table, according to the American Academy of Pediatrics and U.S. Centers of Disease Control and Prevention,* unless otherwise told not to by a reputable medical professional (Daley & Glanz, 2011).
- Finally, if a child does get ill, remember this: Minor illnesses during childhood sometimes provide immunity to more serious illnesses later on.

Figure 7-4 Vaccination Schedule



(**Source:** http://www.cdc.gov/vaccines/parents/downloads/parent-ver-sch-0-6yrs.pdf.)

lateralization
the process in which certain cognitive functions are located more in one hemisphere of the brain than in the other

BRAIN LATERALIZATION. The two halves of the brain also begin to become increasingly differentiated and specialized. **Lateralization**, the process in which certain functions are located more in one hemisphere than the other, becomes more pronounced during the preschool years.

For most people, the left hemisphere is involved primarily with tasks that necessitate verbal competence, such as speaking, reading, thinking, and reasoning. The right hemisphere develops its own strengths, especially in nonverbal areas such as comprehension of spatial relationships, recognition of patterns and drawings, music, and emotional expression (Pollak, Holt, & Wismer Fries, 2004; Watling & Bourne, 2007; Dundas, Plaut, & Behrmann, 2013; see Figure 7-5).

Each of the two hemispheres also begins to process information in a slightly different manner. The left hemisphere processes information sequentially, one piece of data at a time. The right hemisphere processes information in a more global manner, reflecting on it as a whole (Ansaldo, Arguin, & Roch -Locours, 2002; Holowka & Petitto, 2002; Barber et al., 2012).

Although there is some specialization of the hemispheres, in most respects the two hemispheres act in tandem. They are interdependent, and the differences between the two are minor. Even the hemispheric specialization in certain tasks is not absolute. In fact, each hemisphere can perform most of the tasks of the other. For example, the right hemisphere does some language processing and plays an important role in language comprehension (Corballis, 2003; Hutchinson, Whitman, & Abeare, 2003; Hall, Neal, & Dean, 2008; Jahagirdar, 2014).

Furthermore, the brain has remarkable resiliency. In another example of human plasticity, if the hemisphere that specializes in a particular type of information is damaged, the other hemisphere can take up the slack. For instance, when young children suffer brain damage to the left side of the brain (which specializes in verbal processing) and initially lose language capabilities, the linguistic deficits are often not permanent. In such cases, the right side of the brain pitches in and may be able to compensate substantially for the damage to the left hemisphere (Kolb & Gibb, 2006).

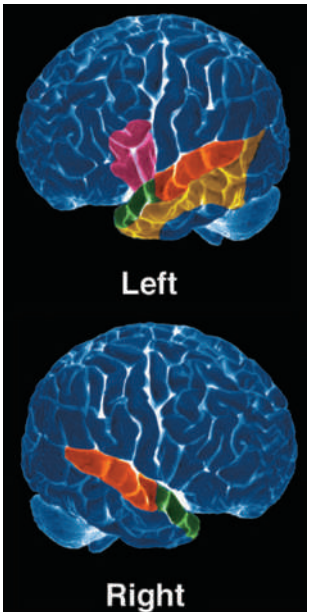
There are also individual and cultural differences in lateralization. For example, many of the 10 percent of people who are left-handed or ambidextrous (able to use both hands interchangeably) have language centered in their right hemispheres or have no specific language center (Compton & Weissman, 2002; Isaacs et al., 2006; Szaflarski et al., 2012).

Even more intriguing are differences in lateralization related to gender and culture. For instance, starting during the first year of life and continuing in the preschool years, boys and girls show some hemispheric differences associated with lower body reflexes and the processing of auditory information. Boys also clearly tend to show greater lateralization of language in the left hemisphere; among females, language is more evenly divided between the two hemispheres. Such differences may help explain why—as we'll see later in the chapter—girls' language development proceeds at a more rapid pace during the preschool years than boys' language development (Grattan et al., 1992; Bourne & Todd, 2004).

According to psychologist Simon Baron-Cohen, the differences between male and female brains may help explain the puzzling riddle of *autism spectrum disorder*, the profound developmental disability that often produces language deficits and great difficulty in interacting with others. Baron-Cohen argues that children with autism spectrum disorder (who are predominately male) have what he calls an "extreme male brain." The extreme male brain, though relatively good at systematically sorting out the world, is poor at understanding the emotions of others and experiencing empathy for others' feelings. To Baron-Cohen, individuals with an extreme male brain have traits associated with the normal male brain but display the traits to such an extent that their behavior is viewed as autistic (Auyeung et al., 2009; Auyeung & Baron-Cohen, 2012; Lau et al., 2013; Ruigrok et al., 2014).

Figure 7-5 Looking into the Brain

This set of PET brain scans illustrates that activity in the right or left hemisphere of the brain differs according to the task in which a person is engaged. How might educators use this finding in their approach to teaching?



Although Baron-Cohen's theory is quite controversial, it is clear that some kind of gender differences exist in lateralization. But we still don't know the extent of the differences and why they occur. One explanation is genetic: Female and male brains are predisposed to function in slightly different ways. Such a view is supported by data suggesting that there are minor structural differences between males' and females' brains. For instance, a section of the corpus callosum is proportionally larger in women than in men. Furthermore, studies conducted among other species, such as primates, rats, and hamsters, have found size and structural differences in the brains of males and females (Witelson, 1989; Highley et al., 1999; Matsumoto, 1999; Luders, Toga, & Thompson, 2014).

Before we accept a genetic explanation for the differences between female and male brains, we need to consider an equally plausible alternative: It may be that verbal abilities emerge earlier in girls because girls receive greater encouragement for verbal skills than boys do. For instance, even as infants, girls are spoken to more than boys (Beal, 1994). Such higher levels of verbal stimulation may produce growth in particular areas of the brain that does not occur in boys. Consequently, environmental factors rather than genetic ones may lead to the gender differences we find in brain lateralization. Most likely, a combination of genetics and environment is at work, as it is with many of our other human characteristics. Once again, we find that teasing out the relative impact of heredity and environment is a challenging task.

THE LINKS BETWEEN BRAIN GROWTH AND COGNITIVE DEVELOPMENT. Neuroscientists are just beginning to understand the ways in which brain development is related to cognitive development. For example, it appears that there are periods during childhood in which the brain shows unusual growth spurts, and these periods are linked to advances in cognitive abilities. One study that measured electrical activity in the brain across the life span found unusual spurts at between 1½ and 2 years, a time when language abilities increase rapidly. Other spurts occurred around other ages when cognitive advances are particularly intense (see Figure 7-6; Mabbott et al., 2006; Westermann et al., 2007).

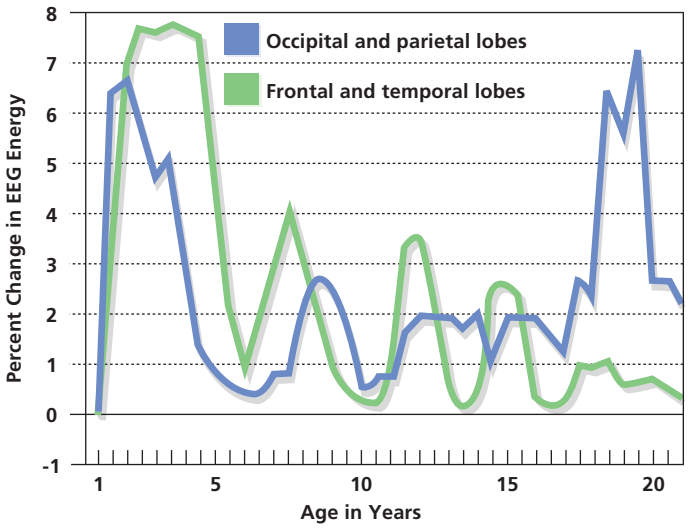
Other research has suggested that increases in myelin, the protective insulation that surrounds parts of neurons, may be related to preschoolers' growing cognitive capabilities. For example, myelination of the *reticular formation*, an area of the brain associated with attention and concentration, is completed by the time children are about five. This may be associated with children's growing attention spans as they approach school age. The improvement in memory that occurs during the preschool years may also be associated with myelination. During the preschool years, myelination is completed in the hippocampus, an area associated with memory (Rolls, 2000).

In addition, significant growth takes place in the nerves connecting the *cerebellum*, the part of the brain that controls balance and movement, to the *cerebral cortex*, the structure responsible for sophisticated information processing. The growth in these nerve fibers is related to the significant advances in motor skills that occur during the preschool years, as well as to advances in cognitive processing (Carson, 2005; Gordon, 2007).

We do not yet know the direction of causality (does brain development produce cognitive advances, or do cognitive accomplishments fuel brain development?). However, it is clear that increases in our understanding of the physiological aspects of the brain will eventually have important implications for parents and teachers.

Figure 7-6 Brain Growth Spurt

According to one study, electrical activity in the brain has been linked to advances in cognitive abilities at various stages across the life span. In this graph, activity increases dramatically between 1½ and 2 years of age, a period during which language rapidly develops.



(**Source:** Fischer, K. W., & Rose, S. P. [1995]).

Motor Development

LO 7.3 Explain how preschool children's motor skills develop.

Anya sat in the sandbox at the park, chatting with the other parents and playing with her two children, 5-year-old Nicholai and 13-month old Smetna. While she chatted, she kept a close eye on Smetna, who would still put sand in her mouth sometimes if she wasn't stopped. Today, however, Smetna seemed content to run the sand through her hands and try to put it into a bucket. Nicholai, meanwhile, was busy with two other boys, rapidly filling and emptying the other sand buckets to build an elaborate sand city, which they would then destroy with toy trucks.

When children of different ages gather at a playground, it's easy to see that preschool children have come a long way in their motor development since infancy. Both their gross and fine motor skills have become increasingly fine-tuned. Smetna, for example, is still mastering putting sand into a bucket, while her brother Nicholai uses that skill easily as part of his larger goal of building a sand city.

GROSS MOTOR SKILLS. By the time they are three, children have mastered a variety of skills: jumping, hopping on one foot, skipping, and running. By four and five, their skills have become more refined as they have gained increasing control over their muscles. For instance, at four they can throw a ball with enough accuracy that a friend can catch it, and by age five they can toss a ring and have it land on a peg five feet away. Five-year-olds can learn to ride bikes, climb ladders, and ski downhill—activities that all require considerable coordination. (Figure 7-7 summarizes major gross motor skills that emerge during the preschool years.)

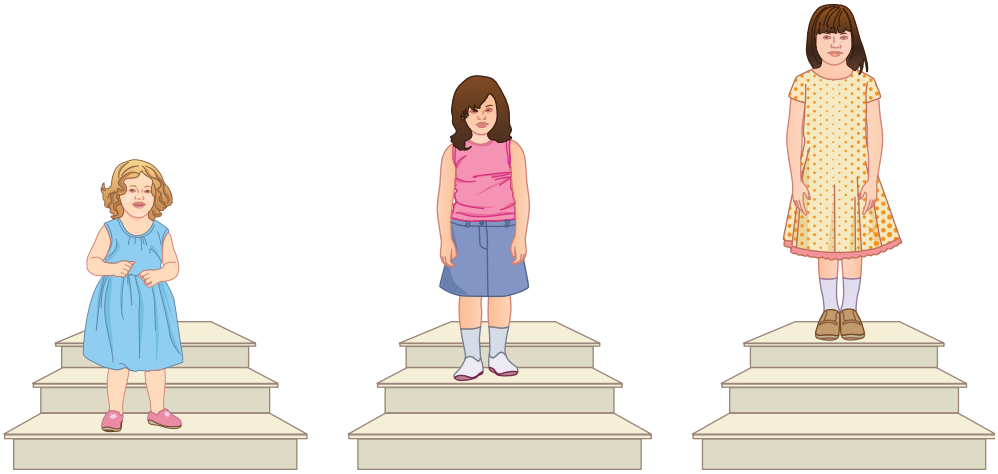
These achievements may be related to brain development and myelination of neurons in areas of the brain that control balance and coordination. Another reason that motor skills develop at such a rapid clip during the preschool years is that children spend a great deal of time practicing them. During this period, the general level of activity is extraordinarily high: Preschoolers seem to be perpetually in motion. The activity level is higher at age three than at any other point in the entire life span.

Girls and boys differ in certain aspects of gross motor coordination, in part because of differences in muscle strength, which is somewhat greater in boys than in girls. For instance, boys can typically throw a ball better and jump higher, and a boy's overall activity level tends to be greater than a girl's. On the other hand, girls generally surpass boys in tasks that involve the coordination of limbs. For instance, at the age of five, girls are better than boys at jumping jacks and balancing on one foot (Largo, Fischer, & Rousson, 2003).

Another aspect of muscular skills—one that parents of toddlers often find most problematic—is bowel and bladder control, as we discuss next.

During the preschool years, children grow in both fine and gross motor skills.

Figure 7-7 Significant Gross Motor Skills in Early Childhood



Age 3	Age 4	Age 5
Able to walk up stairs, alternating feet	Able to walk down a long staircase, alternating feet, with assistance	Able to walk down a long staircase, alternating feet
Unable to stop or turn suddenly	Have some control in starting, stopping, and turning	Capable of starting, stopping, and turning in games
Able to jump a length of 15–24 inches	Length of jump increases to 24–33 inches	Able to make a running jump of 28–36 inches

POTTY WARS: WHEN—AND HOW—SHOULD CHILDREN BE TOILET TRAINED?

Sharon Bell was amazed when her daughter, Leah, just 2, announced she didn't want to wear diapers anymore. From now on, Leah said, she would only use the potty. She was even more amazed when Leah woke up with dry pajamas the next morning, and every morning after that. Three months passed without a single accident. Bell had to admit, her two-year-old was toilet trained.

Leah's determination and success had another surprising effect. Her brother, Adam, age 4, who had never been able to give up his nighttime diaper, suddenly stopped needing one. "I'm older than she is," Adam explained when Bell asked him about the sudden change. "If Leah doesn't wear a diaper anymore, then I'm not wearing one."

Few child-care issues raise so much concern among parents as toilet training. And on few issues are there so many opposing opinions from experts and laypersons. Often, the various viewpoints are played out in the media and even take on political overtones. For instance, well-known pediatrician T. Berry Brazelton suggests a flexible approach to toilet training, advocating that it be put off until the child shows signs of readiness (Brazelton, 1997; Brazelton et al., 1999). On the other hand, psychologist John Rosemond, known primarily for his media advocacy of a conservative, traditional stance to childrearing, argues for a more rigid approach, saying that toilet training should be done early and quickly.

What is clear is that the age at which toilet training takes place has been rising over the last 50 years. For example, in 1957, 92 percent of children were toilet trained by the age of 18 months. Today, the average age of toilet training is around 30 months (Goode, 1999; Boyse & Fitzgerald, 2010).

Current guidelines of the American Academy of Pediatrics echo Brazelton's position, suggesting that there is no single time to begin toilet training and that training should begin only when children show that they are ready. The signs of readiness include staying dry at least two hours at a time during the day or waking up dry after naps; regular and predictable bowel movements; an indication, through facial expressions or words, that urination or a bowel movement is about to occur; the ability to follow simple directions; the ability to get to the bathroom and undress alone; discomfort with soiled diapers; asking to use the toilet or potty chair; and the desire to wear underwear.

Among the signs that children are ready to give up diapers is evidence that they are able to follow directions and can get to the bathroom and undress on their own.

Furthermore, children must be ready not only physically but also emotionally, and if they show strong signs of resistance to toilet training, toilet training should be put off. Children younger than 12 months have no bladder or bowel control, and they have only slight control for six months longer. Although some children show signs of readiness for toilet training between 18 and 24 months, some are not ready until 30 months or older (American Academy of Pediatrics, 1999; Fritz & Rockney, 2004; Connell-Carrick, 2006).

Even after children are toilet trained during the day, it often takes months or years before they are able to achieve control at night. Around three-quarters of boys and most girls are able to stay dry after the age of five years.

Complete toilet training eventually occurs in almost all children as they mature and attain greater control over their muscles. However, delayed toilet training can be a cause for concern if a child is upset about it or if it makes the child a target of ridicule from siblings or peers. In such cases, several types of treatments have proven effective. In particular, treatments in which children are rewarded for staying dry or are awakened by a battery device that senses when they have wet the bed are often effective (Houts, 2003; Vermandel et al., 2008; Millei & Gallagher, 2012).

FINE MOTOR SKILLS. At the same time that gross motor skills are developing, children are progressing in their ability to use fine motor skills, which involve more delicate, smaller body movements, such as using a fork and spoon, cutting with a scissors, tying one's shoelaces, and playing the piano.

The skills involved in fine motor movements require a good deal of practice, as anyone who has watched a four-year-old struggling painstakingly to copy letters of the alphabet knows. The emergence of these fine motor skills shows clear developmental patterns. At the age of three, children are already able to draw a circle and square with a crayon, and they can undo their clothes when they go to the bathroom. They can put a simple jigsaw puzzle together, and they can fit blocks of different shapes into matching holes. However, they do not show much precision and polish in accomplishing such tasks. For instance, they may try to force puzzle pieces into place.

By the age of four, their fine motor skills are considerably better. They can draw a person that looks like a person, and they can fold paper into triangular designs. And by the time they are five, they are able to hold and manipulate a thin pencil properly.

HANDEDNESS. How do preschoolers decide which hand to hold the pencil in as they work on their copying and other fine motor skills? For many, their choice was established soon after birth.

handedness
the preference of using one hand over another

Beginning in early infancy, many children show signs of a preference for the use of one hand over another—the development of **handedness**. For instance, young infants may show a preference for one side of their bodies over another. By the age of seven months, some infants seem to favor one hand by grabbing more with it than the other. Most children display a clear-cut tendency to use one hand over the other by the end of the preschool years. Some 90 percent are right-handed and 10 percent are left-handed. Furthermore, there is a gender difference: More boys than girls are left-handed. A few children remain ambidextrous even after the preschool years, using both hands with equal ease (Segalowitz, & Rapin, 2003; Marschik et al., 2008; Scharoun & Bryden, 2014).

Much speculation has been devoted to the meaning of handedness, but there are few conclusions. Some research finds that left-handedness is related to higher achievements, other research shows no advantage for being left-handed, and some findings suggest that children who are ambidextrous perform less well on academic tasks. Clearly, the jury

is out on the consequences of handedness (Dutta & Mandal, 2006; Corballis, Hattie, & Fletcher, 2008; Casasanto & Henetz, 2012).

Module 7.1 Review

- The preschool period is marked by steady physical growth. Preschoolers tend to eat less than they did as babies but generally regulate their food intake appropriately, given nutritious options and the freedom to develop their own choices and controls. The preschool period is generally the healthiest time of life, with only minor illnesses threatening children. Accidents and environmental hazards are the greatest threats to preschoolers' health.
- Brain growth is rapid during the preschool years. In addition, the brain develops lateralization, a tendency of the two hemispheres to adopt specialized tasks.
- Gross and fine motor development also advances rapidly during the preschool years. Boys' and girls' gross motor skills begin to diverge, and children develop handedness.

Journal Writing Prompt

Applying Lifespan Development: What are some ways that increased understanding of issues relating to the physical development of preschoolers might help parents and caregivers in their care of children?

Intellectual Development

Three-year-old Sam was talking to himself. As his parents listened with amusement from another room, they could hear him using two very different voices. "Find your shoes," he said in a low voice. "Not today. I'm not going. I hate the shoes," he said in a higher-pitched voice. The lower voice answered, "You are a bad boy. Find the shoes, bad boy." The higher-voiced response was "No, no, no."

Sam's parents realized that he was playing a game with his imaginary friend, Gill. Gill was a bad boy who often disobeyed his mother, at least in Sam's imagination. In fact, according to Sam's musings, Gill often was guilty of the very same misdeeds for which his parents blamed Sam.

In some ways, the intellectual sophistication of three-year-olds is astounding. Their creativity and imagination leap to new heights, their language is increasingly sophisticated, and they reason and think about the world in ways that would have been impossible even a few months earlier. But what underlies the dramatic advances in intellectual development that start in the preschool years and continue throughout that period? We have discussed the general outlines of the brain development that underlies cognitive development in preschoolers. Let's now consider several approaches to children's thinking, starting with a look at Piaget's findings on the cognitive changes that occur during the preschool years.

Piaget's Stage of Preoperational Thinking

LO 7.4 Summarize how Piaget explains cognitive development during the preschool years.

Swiss psychologist Jean Piaget, whose stage approach to cognitive development we discussed in Chapter 5, saw the preschool years as a time of both stability and great change. He suggests that the preschool years fit entirely into a single stage of cognitive development—the preoperational stage—which lasts from the age of two years until around seven years.

During the **preoperational stage**, children's use of symbolic thinking grows, mental reasoning emerges, and the use of concepts increases. Seeing Mom's car keys may prompt a question, "Go to store?" as the child comes to see the keys as a symbol of a car ride. In this way, children become better at representing events internally, and they grow less dependent on the use of direct sensorimotor activity to understand the world around them. Yet they are still not capable of **operations**: organized, formal, logical mental processes that characterize school-age children. It is only at the end of the preoperational stage that the ability to carry out operations comes into play.

preoperational stage
according to Piaget, the stage from approximately age two to age seven in which children's use of symbolic thinking grows, mental reasoning emerges, and the use of concepts increases

operations
organized, formal, logical mental processes

According to Piaget, a key aspect of preoperational thought is *symbolic function*, the ability to use a mental symbol, a word, or an object to stand for or represent something that is not physically present. For example, during this stage, preschoolers can use a mental symbol for a car (the word *car*), and they likewise understand that a small toy car is representative of the real thing. Because of their ability to use symbolic function, children have no need to get behind the wheel of an actual car to understand its basic purpose and use.

THE RELATION BETWEEN LANGUAGE AND THOUGHT. Symbolic function is at the heart of one of the major advances that occurs in the preoperational period: the increasingly sophisticated use of language. As we discuss later in this chapter, children make substantial progress in language skills during the preschool period.

Piaget suggests that language and thinking are tightly interconnected and that the advances in language that occur during the preschool years reflect several improvements over the type of thinking that is possible during the earlier sensorimotor period. For instance, thinking embedded in sensorimotor activities is relatively slow because it depends on actual movements of the body that are bound by human physical limitations. In contrast, the use of symbolic thought, such as the development of an imaginary friend, allows preschoolers to represent actions symbolically, permitting much greater speed.

Even more important, the use of language allows children to think beyond the present to the future. Consequently, rather than being grounded in the immediate here and now, preschoolers can imagine future possibilities through language in the form of sometimes elaborate fantasies and daydreams.

Do the improved language abilities of preschoolers lead to improvements in thinking, or is it the other way around, with the improvements in thinking during the preoperational period leading to enhancements in language ability? This question—whether thought determines language or language determines thought—is one of the enduring and most controversial questions within the field of psychology. Piaget's answer is that language grows out of cognitive advances rather than the other way around. He argues that improvements during the earlier sensorimotor period are necessary for language development and that continuing growth in cognitive ability during the preoperational period provides the foundation for language ability.

CENTRATION: WHAT YOU SEE IS WHAT YOU THINK. Place a dog mask on a cat and what do you get? According to three- and four-year-old preschoolers, a dog. To them, a cat with a dog mask ought to bark like a dog, wag its tail like a dog, and eat dog food. In every respect, the cat has been transformed into a dog (de Vries, 1969).

centration
the process of concentrating on one limited aspect of a stimulus and ignoring other aspects

To Piaget, the root of this belief is centration, a key element, and limitation, of the thinking of children in the preoperational period. **Centration** is the process of concentrating on one limited aspect of a stimulus and ignoring other aspects.

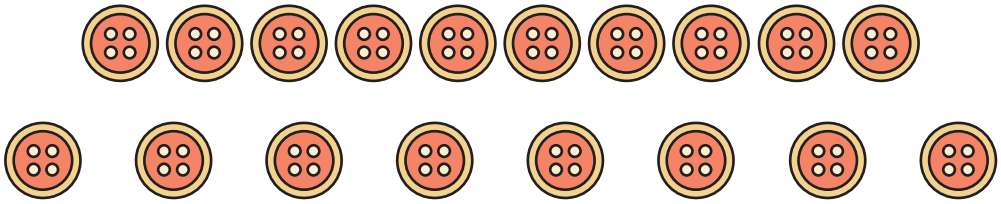
Preschoolers are unable to consider all available information about a stimulus. Instead, they focus on superficial, obvious elements that are within their sight. These external elements come to dominate preschoolers' thinking, leading to inaccuracy in thought.

When preschoolers are shown two rows of buttons, one with 10 buttons that are spaced closely together and the other with 8 buttons spread out to form a longer row (see Figure 7-8), and asked which of the rows contains more buttons, children who are four or five usually choose the row that looks longer rather than the one that actually contains more buttons. This occurs in spite of the fact that children this age know quite well that 10 is more than 8.

The cause of the children's mistake is that the visual image of the longer row dominates their thinking. Rather than taking into account their understanding of quantity, they focus on appearance. To a preschooler, appearance is everything. Preschoolers' focus on appearances might be related to another aspect of preoperational thought, the lack of conservation.

Figure 7-8 Which Row Contains More Buttons?

When preschoolers are shown these two rows and asked which row has more buttons, they usually respond that the lower row of buttons contains more because it looks longer. They answer in this way even though they know quite well that 10 is greater than 8. Do you think preschoolers can be *taught* to answer correctly?



CONSERVATION: LEARNING THAT APPEARANCES ARE DECEIVING. Consider the following scenario:

> *Four-year-old Jaime is shown two drinking glasses of different shapes. One is short and broad; the other is tall and thin. A teacher half-fills the short, broad glass with apple juice. The teacher then pours the juice into the tall, thin glass. The juice fills the tall glass almost to the brim. The teacher asks Jaime a question: Is there more juice in the second glass than there was in the first?*

If you view this as an easy task, so do children like Jaime. They have no trouble answering the question. However, they almost always get the answer wrong.

Most four-year-olds respond that there is more apple juice in the tall, thin glass than there was in the short, broad one. If the juice is poured back into the shorter glass, they are quick to say that there is now less juice than there was in the taller glass (see Figure 7-9).

The reason for the error in judgment is that children of this age have not mastered conservation. **Conservation** is the knowledge that quantity is unrelated to the arrangement and physical appearance of objects. Because they are unable to conserve, preschoolers can't understand that changes in one dimension (such as a change in appearance) do not necessarily mean that other dimensions (such as quantity) change. For example, children who do not yet understand the principle of conservation feel quite comfortable in asserting that the amount of liquid changes as it is poured between glasses of different sizes. They simply are unable to realize that the transformation in appearance does not imply a transformation in quantity.

conservation
the knowledge that quantity is unrelated to the arrangement and physical appearance of objects

Figure 7-9 Which Glass Contains More?

Most four-year-old children believe that the amount of liquid in these two glasses differs because of the differences in the containers' shapes, even though they may have seen equal amounts of liquid being poured into each.

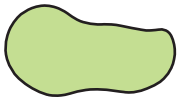
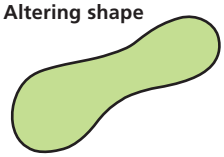
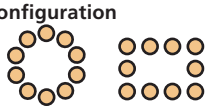
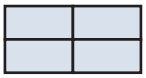
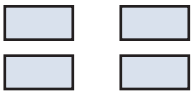
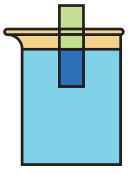
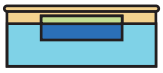
The lack of conservation also manifests itself in children's understanding of area, as illustrated by Piaget's cow-in-the field problem (Piaget, Inhelder, & Szeminska, 1960). In the problem, two sheets of green paper, equal in size, are shown to a child, and a toy cow is placed in each field. Next, a toy barn is placed in each field, and children are asked which cow has more to eat. The typical—and, so far, correct—response is that the cows have the same amount.

In the next step, a second toy barn is placed in each field. But in one field, the barns are placed adjacent to one another, whereas in the second field, they are separated from one another. Children who have not mastered conservation usually say that the cow in the field with the adjacent barns has more grass to eat than the cow in the field with the separated barns. In contrast, children who can conserve answer, correctly, that the amount available is identical. (Some other conservation tasks are shown in Figure 7-10.)

Why do children in the preoperational stage make errors on tasks that require conservation? Piaget suggests that the main reason is that their tendency toward centration

Figure 7-10 Common Tests of Children's Understanding of the Principle of Conservation

Why is a sense of conservation important?

Type of Conservation	Modality	Change in Physical Appearance	Average Age Invariance Is Grasped
Number	Number of elements in a collection 	Rearranging or dislocating elements 	6–7 years
Substance (mass)	Amount of a malleable substance (e.g., clay or liquid) 	Altering shape 	7–8 years
Length	Length of a line or object 	Altering shape or configuration 	7–8 years
Area	Amount of surface covered by a set of plane figures 	Rearranging the figures 	8–9 years
Weight	Weight of an object 	Altering shape 	9–10 years
Volume	Volume of an object (in terms of water displacement) 	Altering shape 	14–15 years

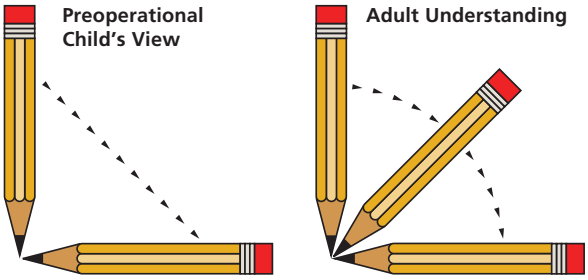
prevents them from focusing on the relevant features of the situation. Furthermore, they cannot follow the sequence of transformations that accompanies changes in the appearance of a situation.

INCOMPLETE UNDERSTANDING OF TRANSFORMATION. A preoperational, preschool child who sees several worms during a walk in the woods may believe that they are all the same worm. The reason: She views each sighting in isolation, and she is unable to understand that a transformation would be necessary for a worm to be able to move quickly from one location to the next.

As Piaget used the term, **transformation** is the process in which one state is changed into another. For instance, adults know that if a pencil that is held upright is allowed to fall down, it passes through a series of successive stages until it reaches its final, horizontal resting spot (see Figure 7-11). In contrast, children in the preoperational period are unable to envision or recall the successive transformations that the pencil followed in moving from the upright to the horizontal position. If asked to reproduce the sequence in a drawing, they draw the pencil upright and lying down, with nothing in between. Basically, they ignore the intermediate steps.

Figure 7-11 The Falling Pencil

Children in Piaget's preoperational stage do not understand that as a pencil falls from the upright to the horizontal position it moves through a series of intermediary steps. Instead, they think that there are no intermediate steps in the change from the upright to horizontal position.



transformation
the process in which one state is changed into another

egocentric thought
thinking that does not take into account the viewpoints of others

EGOCENTRISM: THE INABILITY TO TAKE OTHERS' PERSPECTIVES. Another hallmark of the preoperational period is egocentric thinking. **Egocentric thought** is thinking that does not take into account the viewpoints of others. Preschoolers do not understand that others have different perspectives from their own. Egocentric thought takes two forms: the lack of awareness that others see things from a different physical perspective and the failure to realize that others may hold thoughts, feelings, and points of view that differ from theirs. (Note what egocentric thought does *not* imply: that preoperational children intentionally think in a selfish or inconsiderate manner.)

Egocentric thinking is what is behind children's lack of concern over their nonverbal behavior and the impact it has on others. For instance, a four-year-old who is given an unwanted gift of socks when he was expecting something more desirable may frown and scowl as he opens the package, unaware that his face can be seen by others, and may reveal his true feelings about the gift (Cohen, 2013).

Egocentrism lies at the heart of several other types of behavior during the preoperational period. For instance, preschoolers may talk to themselves, even in the presence of others, and at times they simply ignore what others are telling them. Rather than being a sign of eccentricity, such behavior illustrates the egocentric nature of preoperational children's thinking: the lack of awareness that their behavior acts as a trigger to others' reactions and responses. Consequently, a considerable amount of verbal behavior on the part of preschoolers has no social motivation behind it but is meant for the preschoolers' own consumption.

Similarly, egocentrism can be seen in hiding games with children during the preoperational stage. In a game of hide-and-seek, three-year-olds may attempt to hide by covering their faces with a pillow—even though they remain in plain view. Their reasoning: If they cannot see others, others cannot see them. They assume that others share their view.

THE EMERGENCE OF INTUITIVE THOUGHT. Because Piaget labeled the preschool years as the "preoperational period," it is easy to assume that this is a period of marking time, waiting for the more formal emergence of operations. As if to support this view, many of the characteristics of the preoperational period highlight deficiencies, cognitive skills that the preschooler has yet to master. However, the preoperational period is far from idle.

WATCH THIS VIDEO ON MYPSYCHLAB
CONSERVATION

WATCH THIS VIDEO ON MYPSYCHLAB
EGOCENTRISM

Cognitive development proceeds steadily, and in fact several new types of ability emerge. A case in point: the development of intuitive thought.

Intuitive thought refers to preschoolers' use of primitive reasoning and their avid acquisition of knowledge about the world. From about age four through seven, children's curiosity blossoms. They constantly seek out the answers to a wide variety of questions, asking, "Why?" about nearly everything. At the same time, children may act as if they are authorities on particular topics, feeling certain that they have the correct—and final—word on an issue. If pressed, they are unable to explain how they know what they know. In other words, their intuitive thought leads them to believe that they know answers to all kinds of questions, but there is little or no logical basis for this confidence in their understanding of the way the world operates. This may lead a preschooler to state authoritatively that airplanes can fly because they move their wings up and down like a bird, even if they have never seen an airplane's wings moving in that way.

intuitive thought
thinking that reflects preschoolers' use of primitive reasoning and their avid acquisition of knowledge about the world

In the late stages of the preoperational period, children's intuitive thinking does have certain qualities that prepare them for more sophisticated forms of reasoning. For instance, preschoolers come to understand that pushing harder on the pedals makes a bicycle move faster, or that pressing a button on a remote control makes the television change channels. By the end of the preoperational stage, preschoolers begin to understand the notion of *functionality*, the idea that actions, events, and outcomes are related to one another in fixed patterns.

Children also begin to show an awareness of the concept of identity in the later stages of the preoperational period. *Identity* is the understanding that certain things stay the same, regardless of changes in shape, size, and appearance. For instance, knowledge of identity allows one to understand that a lump of clay contains the same amount of clay regardless of whether it is clumped into a ball or stretched out like a snake. Comprehension of identity is necessary for children to develop an understanding of conservation, the ability to understand that quantity is not related to physical appearances, as we discussed earlier. Piaget regarded children's development of conservation as a skill that marks the transition from the preoperational period to the next stage, concrete operations, which we will discuss in Chapter 9.

EVALUATING PIAGET'S APPROACH TO COGNITIVE DEVELOPMENT. Piaget, a masterful observer of children's behavior, provided a detailed portrait of preschoolers' cognitive abilities. The broad outlines of his approach have given us a useful way of thinking about the progressive advances in cognitive ability that occur during the preschool years (Siegal, 1997).

It is important, however, to consider Piaget's approach to cognitive development within the appropriate historical context and in light of more recent research findings. As we discussed in Chapter 5, his theory is based on extensive observations of relatively few children. Despite his insightful and groundbreaking observations, recent experimental investigations suggest that in certain regards, Piaget underestimated children's capabilities.

Take, for instance, Piaget's views of how children in the preoperational period understand numbers. Piaget contended that preschoolers' thinking is seriously handicapped, as evidenced by their performance on tasks involving conservation and reversibility, the understanding that a transformation can be reversed to return something to its original state. Yet more recent experimental work suggests otherwise. Developmental psychologist Rochel Gelman has found that children as young as three can easily tell the difference between rows of two and three toy animals, regardless of the animals' spacing. Older children are able to note differences in number, performing tasks such as identifying which of two numbers is larger and indicating that they understand some rudiments of

addition and subtraction problems (Cordes & Brannon, 2009; Izard et al., 2009; Brandone et al., 2012).

Based on such evidence, Gelman concludes that children have an innate ability to count, one akin to the ability to use language that some theorists see as universal and genetically determined. Such a conclusion is clearly at odds with Piagetian notions, which suggest that children's numerical abilities do not blossom until after the preoperational period.

Some developmentalists (particularly those who favor the information processing approach, as we'll see later in the chapter) also believe that cognitive skills develop in a more continuous manner than Piaget's stage theory implies. They believe that rather than thought changing in quality, as Piaget argues, developmental changes are more quantitative in nature, improving gradually. Such critics regard the underlying processes that produce cognitive skill as undergoing only minor changes with age.

There are further difficulties with Piaget's view of cognitive development. His contention that conservation does not emerge until the end of the preoperational period, and in some cases even later, has not stood up to careful experimental scrutiny. Children can be taught to answer correctly on conservation tasks following certain training and experiences. The fact that one can improve children's performance on these tasks argues against the Piagetian view that children in the preoperational period have not reached a level of cognitive maturity that would permit them to understand conservation (Ping & Goldin-Meadow, 2008).

Clearly, children are more capable at an earlier age than Piaget's account would lead us to believe. Why did Piaget underestimate children's cognitive abilities? One answer is that his questioning of children used language that was too difficult to allow children to answer in a way that would provide a true picture of their skills. In addition, as we've seen, Piaget tended to concentrate on preschoolers' *deficiencies* in thinking, focusing his observations on children's lack of logical thought. By focusing more on children's competence, more recent theorists have found increasing evidence for a surprising degree of capability in preschoolers.

Information Processing Approaches to Cognitive Development

LO 7.5 Summarize the information processing approaches to cognitive development in the preschool years.

> *Even as an adult, Paco has clear recollections of his first trip to a ranch, which he took when he was three years old. He was visiting his godfather, who lived in New Mexico, and the two of them went to a nearby ranch. Paco recounts seeing what seemed like hundreds of cattle, and he clearly recalls his fear of the llamas, which seemed huge, smelly, and frightening. Most of all, he recalls the thrill of riding on a horse with his godfather.*

The fact that Paco has a clear memory of his ranch trip is not surprising: Most people have unambiguous, and seemingly accurate, memories dating as far back as the age of three. But are the processes used to form memories during the preschool years similar to those that operate later in life? More broadly, what general changes in the processing of information occur during the preschool years?

Information processing approaches focus on changes in the kinds of "mental programs" that children use when approaching problems. They view the changes that occur in children's cognitive abilities during the preschool years as analogous to the way a computer program becomes more sophisticated as a programmer modifies it on the basis of experience. For many child developmentalists, information processing approaches represent the dominant, most comprehensive, and ultimately the most accurate explanation of how children develop cognitively (Lacerda, von Hofsten, & Heimann, 2001).

In the next sections, we'll focus on two areas that highlight the approach taken by information processing theorists: understanding of numbers and memory development during the preschool years.

PRESCHOOLERS' UNDERSTANDING OF NUMBERS. As we saw earlier, one of the flaws critics have noticed in Piaget's theory is that preschoolers have a greater understanding of numbers than Piaget thought. Researchers using information processing approaches to cognitive development have found increasing evidence that preschoolers have a sophisticated understanding of numbers. The average preschooler is able not only to count but also to do so in a fairly systematic, consistent manner (Siegler, 1998).

For instance, developmental psychologist Rochel Gelman suggests that preschoolers follow a number of principles in their counting. Shown a group of several items, they know they should assign just one number to each item and that each item should be counted only once. Moreover, even when they get the *names* of numbers wrong, they are consistent in their usage. For instance, a four-year-old who counts three items as "1, 3, 7" will say "1, 3, 7" when counting another group of different items. And if asked how many there are, she will probably answer that there are seven items in the group (Gallistel, 2007; Le Corre & Carey, 2007; Slusser, Ditta, & Sarnecka, 2013).

In short, preschoolers may demonstrate a surprisingly sophisticated understanding of numbers, although their understanding is not totally precise. Still, by the age of four, most are able to carry out simple addition and subtraction problems by counting, and they are able to compare different quantities quite successfully (Gilmore & Spelke, 2008; Jansen et al., 2014).

MEMORY: RECALLING THE PAST. Think back to your own earliest memory. If you are like Paco, described earlier, and most other people too, it probably is of an event that occurred after the age of three. **Autobiographical memory**, memory of particular events from one's own life, achieves little accuracy until after three years of age. Accuracy then increases gradually and slowly throughout the preschool years (Nelson & Fivush, 2004; Reese & Newcombe, 2007; Wang, 2008; Valentino et al., 2014).

autobiographical memory
memory of particular events from one's own life

Preschool children's recollections of events that happened to them are sometimes, but not always, accurate. For instance, three-year-olds can remember central features of routine occurrences, such as the sequence of events involved in getting ready for bed, fairly well. In addition, preschoolers are typically accurate in their responses to open-ended questions, such as "What rides did you like best at the amusement park?" (Wang, 2006; Pathman et al., 2013).

scripts
broad representations in memory of events and the order in which they occur

The accuracy of preschoolers' memories is partly determined by how soon the memories are assessed. Unless an event is particularly vivid or meaningful, it is not likely to be remembered at all. Moreover, not all autobiographical memories last into later life. For instance, a child may remember the first day of kindergarten six months or a year later, but later in life might not remember that day at all.

This preschooler may recall this ride in six months, but by the time she is 12, it will probably be forgotten. Can you explain why?

Memories are also affected by cultural factors. For example, Chinese college students' memories of early childhood are more likely to be unemotional and reflect activities involving social roles, such as working in a family store, whereas U.S. college students' earliest memories are more emotionally elaborate and focus on specific events such as the birth of a sibling (Wang, 2006, 2007; Peterson, Wang, & Hou, 2009).

Not only do preschoolers' autobiographical memories fade, but what is remembered may not be wholly accurate. For example, if an event happens often, such as a trip to a grocery store, it may be hard to remember one specific time it happened. Preschoolers' memories of familiar events are often organized in terms of **scripts**, broad representations in memory of events and the order in which they occur.

For example, a young preschooler might represent eating in a restaurant in terms of a few steps: talking to a waitress, getting the food, and eating. With age, the scripts become more elaborate: getting in the car, being seated at the restaurant, choosing food, ordering, waiting for the meal to come, eating, ordering dessert, and paying for the food. Because events that are frequently repeated tend to be melded into scripts, particular instances of a scripted event are recalled with

less accuracy than those that are unscripted in memory (Fivush, Kuebli, & Clubb, 1992; Sutherland, Pipe, & Schick, 2003).

There are other reasons why preschoolers may not have entirely accurate autobiographical memories. Because they have difficulty describing certain kinds of information, such as complex causal relationships, they may oversimplify recollections. For example, a child who has witnessed an argument between his grandparents may only remember that grandma took the cake away from grandpa, not the discussion of his weight and cholesterol that led up to the action.

INFORMATION PROCESSING THEORIES IN PERSPECTIVE. According to information processing approaches, cognitive development consists of gradual improvements in the ways people perceive, understand, and remember information. With age and practice, preschoolers process information more efficiently and with greater sophistication, and they are able to handle increasingly complex problems. In the eyes of proponents of information processing approaches, it is these quantitative advances in information processing—and not the qualitative changes suggested by Piaget—that constitute cognitive development (Zhe & Siegler, 2000; Rose, Feldman, & Jankowski, 2009).

For supporters of information processing approaches, the reliance on well-defined processes that can be tested, with relative precision, by research is one of the perspective's most important features. Rather than relying on concepts that are somewhat vague, such as Piaget's notions of assimilation and accommodation, information processing approaches provide a comprehensive, logical set of concepts.

For instance, as preschoolers grow older, they have longer attention spans, can monitor and plan what they are attending to more effectively, and become increasingly aware of their cognitive limitations. As discussed earlier in this chapter, these advances may be due to brain development. Such increasing attentional abilities place some of Piaget's findings in a different light. For instance, increased attention span allows older children to attend to both the height *and* the width of tall and short glasses into which liquid is poured. This permits them to understand that the amount of liquid in the glasses stays the same when it is poured back and forth. Preschoolers, in contrast, are unable to attend to both dimensions simultaneously and thus are less able to conserve (Hudson, Sosa, & Shapiro, 1997).

Proponents of information processing theory have also been successful in focusing on important cognitive processes to which alternative approaches traditionally have paid little attention, such as the contribution of mental skills like memory and attention to children's thinking. They suggest that information processing provides a clear, logical, and full account of cognitive development.

Yet information processing approaches have their detractors, who raise significant points. For one thing, the focus on a series of single, individual cognitive processes leaves out of consideration some important factors that appear to influence cognition. For instance, information processing theorists pay relatively little attention to social and cultural factors—a deficiency that the approach we'll consider next attempts to remedy.

An even more important criticism is that information processing approaches "lose the forest for the trees." In other words, information processing approaches pay so much attention to the detailed, individual sequence of processes that compose cognitive processing and development that they never adequately paint a whole, comprehensive picture of cognitive development—which Piaget clearly did quite well.

Developmentalists using information processing approaches respond to such criticisms by saying that their model of cognitive development has the advantage of being precisely stated and capable of leading to testable hypotheses. They also argue that there is far more research supporting their approach than there is for alternative theories of cognitive development. In short, they suggest that their approach provides a more accurate account than any other.

Information processing approaches have been highly influential over the past several decades. They have inspired a tremendous amount of research that has helped us gain some insights into how children develop cognitively.

Vygotsky's View of Cognitive Development: Taking Culture into Account

LO 7.6 Describe Vygotsky's view of cognitive development in the preschool years.

> *As her daughter watches, a member of the Chilcotin Indian tribe prepares a salmon for dinner. When the daughter asks a question about a small detail of the process, the mother takes out another salmon and repeats the entire process. According to the tribal view of learning, understanding and comprehension can come only from grasping the total procedure, and not from learning about the individual subcomponents of the task. (Tharp, 1989)*

The Chilcotin view of how children learn about the world contrasts with the prevalent view of Western society, which assumes that only by mastering the separate parts of a problem can one fully comprehend it. Do differences in the ways particular cultures and societies approach problems influence cognitive development? According to Russian developmental psychologist Lev Vygotsky, who lived from 1896 to 1934, the answer is a clear "yes."

Vygotsky viewed cognitive development as a result of social interactions in which children learn through guided participation, working with mentors to solve problems. Instead of concentrating on individual performance, as Piaget and many alternative approaches do, Vygotsky's increasingly influential view focuses on the social aspects of development and learning.

Vygotsky saw children as apprentices, learning cognitive strategies and other skills from adult and peer mentors who not only present new ways of doing things but also provide assistance, instruction, and motivation. Consequently, he focused on the child's social and cultural world as the source of cognitive development. According to Vygotsky, children gradually grow intellectually and begin to function on their own because of the assistance that adult and peer partners provide (Vygotsky, 1926/1997; Tudge & Scrimsher, 2003).

zone of proximal development (ZPD)
according to Vygotsky, the level at which a child can *almost*, but not fully, perform a task independently, but can do so with the assistance of someone more competent

Vygotsky contends that the nature of the partnership between developing children and adults and peers is determined largely by cultural and societal factors. For instance, culture and society establish the institutions, such as preschools and play groups, that promote development by providing opportunities for cognitive growth. Furthermore, by emphasizing particular tasks, culture and society shape the nature of specific cognitive advances. Unless we look at what is important and meaningful to members of a given society, we may seriously underestimate the nature and level of cognitive abilities that ultimately will be attained (Schaller & Crandall, 2004; Balakrishnan & Claiborne, 2012; Nagahashi, 2013).

Russian developmental psychologist Lev Vygotsky proposed that the focus of cognitive development should be on a child's social and cultural world, as opposed to the Piagetian approach concentrating on individual performance.

For example, children's toys reflect what is important and meaningful in a particular society. In Western society, preschoolers commonly play with toy wagons, automobiles, and other vehicles, in part reflecting the mobile nature of the culture.

Societal expectations about gender also play a role in how children come to understand the world. For example, one study conducted at a science museum found that parents provided more detailed scientific explanations to boys than to girls at museum displays. Such differences in level of explanation may lead to more sophisticated understanding of science in boys and ultimately may produce later gender differences in science learning (Crowley et al., 2001).

In Vygotsky's view, then, children's cognitive development is dependent on interaction with others. Vygotsky argued that it is only through partnership with other people—peers, parents, teachers, and other adults—that children can fully develop their knowledge, thinking processes, beliefs, and values (Fernyhough, 1997; Edwards, 2004).

THE ZONE OF PROXIMAL DEVELOPMENT AND SCAFFOLDING: FOUNDATIONS OF COGNITIVE DEVELOPMENT. Vygotsky proposed that children's cognitive abilities increase through exposure to information that is new enough to be intriguing but not too difficult for the child to handle. He called this the **zone of proximal development**, or **ZPD**, the level at which a child can *almost*, but not fully, perform a task independently but can do

so with the assistance of someone more competent. When appropriate instruction is offered within the zone of proximal development, children are able to increase their understanding and master new tasks. In order for cognitive development to occur, then, new information must be presented—by parents, teachers, or more skilled peers—within the zone of proximal development. For example, a preschooler might not be able to figure out by herself how to get a handle to stick on the clay pot she's building, but she could do it with some advice from her preschool teacher (Kozulin, 2004; Zuckerman & Shenfield, 2007; Norton & D'Ambrosio, 2008).

The concept of the zone of proximal development suggests that even though two children might be able to achieve the same amount without help, if one child receives aid, he or she may improve substantially more than the other. The greater the improvement that comes with help, the larger is the zone of proximal development.

From *an educator's* perspective

If children's cognitive development is dependent on interactions with others, what obligations does society have regarding such social settings as preschools and neighborhoods?

The assistance or structuring provided by others has been termed *scaffolding*. **Scaffolding** is the support for learning and problem solving that encourages independence and growth (Puntambekar & Hübscher, 2005; Blewitt et al., 2009). To Vygotsky, the process of scaffolding not only helps children solve specific problems but also aids in the development of their overall cognitive abilities. Scaffolding takes its name from the scaffolds that are put up to aid in the construction of a building and are removed once the building is complete. In education, scaffolding involves, first of all, helping children think about and frame a task in an appropriate manner. In addition, a parent or teacher is likely to provide clues to task completion that are appropriate to the child's level of development and to model behavior that can lead to completion of the task. As in construction, the scaffolding that more competent people provide to facilitate the completion of identified tasks is removed once children are able to solve a problem on their own (Taumoepeau & Ruffman, 2008; Eitel et al., 2013; Leonard & Higson, 2014).

scaffolding
the support for learning and problem solving that encourages independence and growth

To illustrate how scaffolding operates, consider the following conversation between mother and son:

MOTHER: Do you remember how you helped me make the cookies before?

CHILD: No.

MOTHER: We made the dough and put it in the oven. Do you remember that?

CHILD: When Grandma came?

MOTHER: Yes, that's right. Would you help me shape the dough into cookies?

CHILD: OK.

MOTHER: Can you remember how big we made the cookies when Grandma was here?

CHILD: Big.

MOTHER: Right. Can you show me how big?

CHILD: We used the big wooden spoon.

MOTHER: Good boy, that's right. We used the wooden spoon, and we made big cookies. But let's try something different today by using the ice cream scoop to form the cookies.

Although this conversation isn't particularly sophisticated, it illustrates the practice of scaffolding. The mother is supporting her son's efforts, and she gets him to respond conversationally. In the process, she not only expands her son's abilities by using a different tool (the scoop instead of the spoon) but she also models how conversations proceed.

In some societies parental support for learning differs by gender. In one study, Mexican mothers were found to provide more scaffolding than fathers. A possible explanation is that mothers may be more aware of their children's cognitive abilities than are fathers (Tenenbaum & Leaper, 1998; Tamis-LeMonda & Cabrera, 2002).

One key aspect of the aid that more accomplished individuals provide to learners comes in the form of cultural tools. *Cultural tools* are actual, physical items (e.g., pencils, paper, calculators, computers, and so forth) as well as an intellectual and conceptual framework for solving problems. The intellectual and conceptual framework available to learners includes the language that is used within a culture, its alphabetical and numbering schemes, its mathematical and scientific systems, and even its religious systems. These cultural tools provide a structure that can be used to help children define and solve specific problems, as well as an intellectual point of view that encourages cognitive development.

WATCH THIS VIDEO ON MYPSYCHLAB
SCAFFOLDING

For example, consider the cultural differences in how people talk about distance. In cities, distance is usually measured in blocks ("the store is about 15 blocks away"). To a child from a rural background, such a unit of measurement is meaningless, and more meaningful distance-related terms may be used, such as *yards*, *miles*, such practical rules of thumb as "a stone's throw," or references to known distances and landmarks ("about half the distance to town"). To make matters more complicated, "how far" questions are sometimes answered in terms not of distance, but of time ("it's about 15 minutes to the store"), which will be understood variously to refer to walking or riding time, depending on context—and, if riding time, to different forms of riding. For some children the ride to the store will be conceived of as being by ox cart, for others, by bicycle, bus, canoe, or automobile, again depending on cultural context. The nature of the tools available to children to solve problems and perform tasks is highly dependent on the culture in which they live.

EVALUATING VYGOTSKY'S CONTRIBUTIONS. Vygotsky's view—that the specific nature of cognitive development can be understood only by taking into account cultural and social context—has become increasingly influential in the last decade. In some ways, this is surprising, in light of the fact that Vygotsky died more than eight decades ago at the young age of 37 (Winsler, 2003; Gredler & Shields, 2008).

Several factors explain Vygotsky's growing influence. One is that until recently he was largely unknown to developmentalists. His writings are only now becoming widely disseminated in the United States due to the growing availability of good English translations. In fact, for most of the twentieth century, Vygotsky was not widely known even within his native land. His work was banned for some time due to his reliance on Western theorists, and it was not until the breakup of the Soviet Union that it became freely available in the formerly Soviet countries. Thus, Vygotsky, long hidden from his fellow developmentalists, didn't emerge onto the scene until long after his death (Wertsch, 2008).

Even more important, though, is the quality of Vygotsky's ideas. They represent a consistent theoretical system and help explain a growing body of research attesting to the importance of social interaction in promoting cognitive development. The idea that children's comprehension of the world is an outcome of their interactions with their parents, peers, and other members of society is both appealing and well supported by research findings. It is also consistent with a growing body of multicultural and cross-cultural research, which finds evidence that cognitive development is shaped, in part, by cultural factors (Scrimsher & Tudge, 2003; Hedegaard & Fleer, 2013; Friedrich, 2014).

Of course, not every aspect of Vygotsky's theorizing has been supported, and his conceptualization of cognitive growth can be criticized for its lack of precision. For

instance, such broad concepts as the zone of proximal development are not terribly precise, and they do not always lend themselves to experimental tests (Daniels, 2006).

Furthermore, Vygotsky was largely silent on how basic cognitive processes, such as attention and memory develop and how children's natural cognitive capabilities unfold. Because of his emphasis on broad cultural influences, he did not focus on how individual bits of information are processed and synthesized. These processes, which must be taken into account if we are to have a complete understanding of cognitive development, are more directly addressed by information processing theories.

Still, Vygotsky's melding of the cognitive and social worlds of children has been an important advance in our understanding of cognitive development. We can only imagine what his impact would have been if he had lived a longer life.

Module 7.2 Review

- According to Piaget, children in the preoperational stage develop symbolic function, a qualitative change in their thinking that is the foundation of further cognitive advances. Preoperational children use intuitive thought to explore and draw conclusions about the world, and their thinking begins to encompass the important notions of functionality and identity. Recent developmentalists, while acknowledging Piaget's gifts and contributions, take issue with his emphasis on children's limitations and his underestimation of their capabilities.
- Proponents of information processing approaches argue that quantitative changes in children's processing skills largely account for their cognitive development.
- Vygotsky believed that children develop cognitively within a context of culture and society. His theory includes the concepts of the zone of proximal development and scaffolding.

Journal Writing Prompt

Applying Lifespan Development: In your view, how do thought and language interact in preschoolers' development? Is it possible to think without language? How do children who have been deaf from birth think?

The Growth of Language and Learning

> *I tried it out and it was very great!*
> *This is a picture of when I was running through the water with Mommy.*
> *Where are you going when I go to the fireworks with Mommy and Daddy?*
> *I didn't know creatures went on floats in pools.*
> *We can always pretend we have another one.*
> *(Shatz, 1994, p. 179)*

Listen to Ricky, at the age of three. In addition to recognizing most letters of the alphabet, printing the first letter of his name, and writing the word "HI," he is readily capable of producing the complex sentences quoted above.

During the preschool years, children's language skills reach new heights of sophistication. Children begin the period with reasonable linguistic capabilities, although with significant gaps in both comprehension and production. In fact, no one would mistake the language used by a three-year-old for that of an adult. However, by the end of the preschool years, children can hold their own with adults, both comprehending and producing language that has many of the qualities of adults' language. How does this transformation occur?

Language Development

LO 7.7 Explain how children's language develops in the preschool years.

Language blooms so rapidly between the later months of age two and the mid-threes that researchers have yet to understand the exact pattern. What is clear is that sentence length increases at a steady pace, and the ways in which children at this age combine

words and phrases to form sentences—known as **syntax**—doubles each month. By the time a preschooler is three, the various combinations reach into the thousands.

In addition to the increasing complexity of sentences, there are enormous leaps in the number of words children use. By age six, the average child has a vocabulary of around 14,000 words. To reach this number, preschoolers acquire vocabulary at a rate of nearly one new word every 2 hours, 24 hours a day. They manage this feat through a process known as **fast mapping**, in which new words are associated with their meaning after only a brief encounter (Krcmar, Grela, & Lin, 2007; Kan & Kohnert, 2009; Marinellie & Kneile, 2012).

By the age of three, preschoolers routinely use plurals and possessive forms of nouns (such as "boys" and "boy's"), employ the past tense (adding "-ed" at the end of words), and use articles ("the" and "a"). They can ask, and answer, complex questions ("Where did you say my book is?").

Preschoolers' skills extend to the appropriate formation of words that they have never before encountered. For example, in one classic experiment, preschool children were shown cards with drawings of a cartoon-like bird, such as those shown in Figure 7-12 (Berko, 1958). The experimenter told the children that the figure was a "wug," and then showed them a card with two of the cartoon figures. "Now there are two of them," the children were told, and they were then asked to supply the missing word in the sentence, "There are two_____" (the answer to which, of course, is "wugs").

Not only did children show that they knew rules about the plural forms of nouns, but they understood possessive forms of nouns and the third-person singular and past-tense forms of verbs—all for words that they never had previously encountered, since they were nonsense words with no real meaning (O'Grady & Aitchison, 2005).

Preschoolers also learn what *cannot* be said as they acquire the principles of grammar. **Grammar** is the system of rules that determine how our thoughts can be expressed. For instance, preschoolers come to learn that "I am sitting" is correct, while the similarly structured "I am knowing [that]" is incorrect. Although they still make frequent mistakes of one sort or another, three-year-olds follow the principles of grammar most of the time. Some errors are very noticeable—such as the use of "mens" and "catched"—but these errors are actually quite rare. In fact, young preschoolers are correct in their grammatical constructions more than 90 percent of the time (de Villiers & de Villiers, 1992; Pinker, 1994; Guasti, 2002).

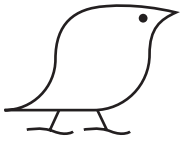
PRIVATE SPEECH AND SOCIAL SPEECH. In even a short visit to a preschool, you're likely to notice some children talking to themselves during play periods. A child might be reminding a doll that the two of them are going to the grocery store later, or another child, while playing with a toy racing car, might speak of an upcoming race. In some cases, the talk is sustained, as when a child working on a puzzle says things like, "This piece goes here. . . . Uh-oh, this one doesn't fit. . . . Where can I put this piece? . . . This can't be right."

Some developmentalists suggest that **private speech**, speech by children that is spoken and directed to themselves, performs an important function. For instance, Vygotsky suggested that private speech is used as a guide to behavior and thought. By communicating with themselves through private speech, children are able to try out ideas, acting as their own sounding boards. In this way, private speech facilitates children's thinking and helps them control their behavior. (Have you ever said to yourself, "Take it easy" or "Calm down" when trying to control your anger over some situation?) In Vygotsky's view, then, private speech ultimately serves an important social function, allowing children to solve problems and reflect upon difficulties they encounter. He also suggested that private speech is a forerunner to the internal dialogues that we use when we reason with ourselves during thinking (Al-Namlah, Meins, & Fernyhough, 2012; McGonigle-Chalmers, Slater, & Smith, 2014).

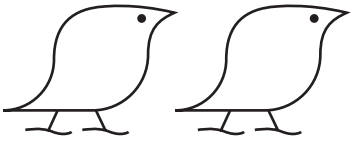
In addition, private speech may be a way for children to practice the practical skills required in conversation, known as *pragmatics*. **Pragmatics** is the aspect of language

Figure 7-12 Appropriate Formation of Words

Even though no preschooler—like the rest of us—is likely to have ever before encountered a wug, preschoolers are able to produce the appropriate word to fill in the blank (which, for the record, is *wugs*).



This is a wug.



Now there is another one.
There are two of them.
There are two _____ .

(**Source:** Berko, J. (1958). The child's learning of English morphology. *Word*, *14*, 150–177.)

syntax
the way in which an individual combines words and phrases to form sentences

fast mapping
a process in which new words are associated with their meaning after only a brief encounter

grammar
the system of rules that determines how our thoughts can be expressed

private speech
speech by children that is spoken and directed to themselves

pragmatics
the aspect of language that relates to communicating effectively and appropriately with others

relating to communicating effectively and appropriately with others. The development of pragmatic abilities permits children to understand the basics of conversations—turn-taking, sticking to a topic, and what should and should not be said, according to the conventions of society. When children are taught that the appropriate response to receiving a gift is "thank you," or that they should use different language in various settings (on the playground with their friends versus in the classroom with their teacher), they are learning the pragmatics of language.

The preschool years also mark the growth of social speech. **Social speech** is speech directed toward another person and meant to be understood by that person. Before the age of three, children may seem to be speaking only for their own entertainment, apparently uncaring as to whether anyone else can understand. However, during the preschool years, children begin to direct their speech to others, wanting others to listen and becoming frustrated when they cannot make themselves understood. As a result, they begin to adapt their speech to others through pragmatics, as just discussed. Recall that Piaget contended that most speech during the preoperational period was egocentric: Preschoolers were seen as taking little account of the effect their speech was having on others. However, more recent experimental evidence suggests that children are somewhat more adept in taking others into account than Piaget initially suggested.

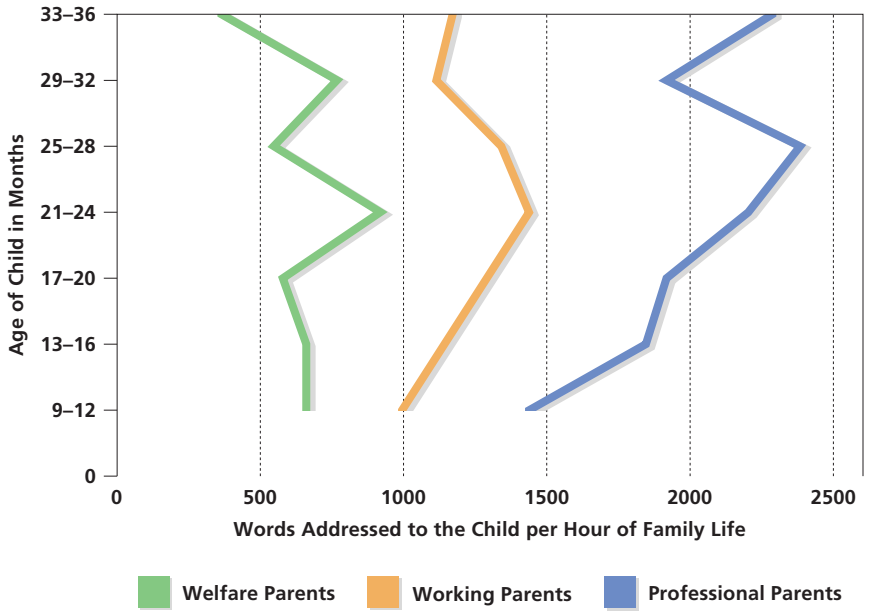
social speech
speech directed toward another person and meant to be understood by that person

HOW LIVING IN POVERTY AFFECTS LANGUAGE DEVELOPMENT. The language that preschoolers hear at home has profound implications for future cognitive success, according to results of a landmark series of studies by psychologists Betty Hart and Todd Risley (Hart & Risley, 1995; Hart, 2000, 2004). The researchers studied the language used over a two-year period by a group of parents of varying levels of affluence as they interacted with their children. Their examination of some 1,300 hours of everyday interactions between parents and children produced several major findings:

- The greater the affluence of the parents, the more they spoke to their children. As shown in Figure 7-13, the rate at which language was addressed to children varied significantly according to the economic level of the family.

Figure 7-13 Different Language Exposure

Parents at differing levels of economic affluence provide different language experiences. Professional parents and working parents address more words to their children, on average, than parents on welfare. Why do you think this is so?



(**Source:** Based on Hart & Risley, 1995.)

- In a typical hour, parents classified as professionals spent almost twice as much time interacting with their children as parents who received welfare assistance.
- By the age of four, children in families that received welfare assistance were likely to have been exposed to some 13 million fewer words than those in families classified as professionals.
- The kind of language used in the home differed among the various types of families. Children in families that received welfare assistance were apt to hear prohibitions ("no" or "stop," for example) twice as frequently as those in families classified as professionals.

Ultimately, the study found that the type of language to which children were exposed was associated with their performance on tests of intelligence. The greater the number and variety of words children heard, for instance, the better their performance at age three on a variety of measures of intellectual achievement.

Although the findings are correlational, and thus cannot be interpreted in terms of cause and effect, they clearly suggest the importance of early exposure to language, in terms of both quantity and variety. They also suggest that intervention programs that teach parents to speak to their children more often and use more varied language may be useful in alleviating some of the potentially damaging consequences of poverty.

The research is also consistent with an increasing body of evidence that family income and poverty have powerful consequences for children's general cognitive development and behavior. By the age of five, children raised in poverty tend to have lower IQ scores and do not perform as well on other measures of cognitive development as children raised in affluence. Furthermore, the longer children live in poverty, the more severe the consequences. Poverty not only reduces the educational resources available to children, but it also has such negative effects on parents that it limits the psychological support they can provide their families. In short, the consequences of poverty are severe, and they linger (Farah et al., 2006; Jokela et al., 2009; Leffel & Suskind, 2013; Kim, Curby, & Winsler, 2014).

Learning from the Media: Television and the Internet

LO 7.8 Summarize the effects television and other media have on preschoolers.

> *Preschoolers Steven Chen and Tracy Carroll are playing Muppets—a game they invented based on the popular children's TV show Sesame Street. "C'mon Snuffy," Tracy screams. "We've got to find Alice!" Both children race to the jungle gym. Today, it's Snuffy's home—the cave where they will search for his little sister. Tomorrow, they'll play Tracy's game, Dora the Explorer.*

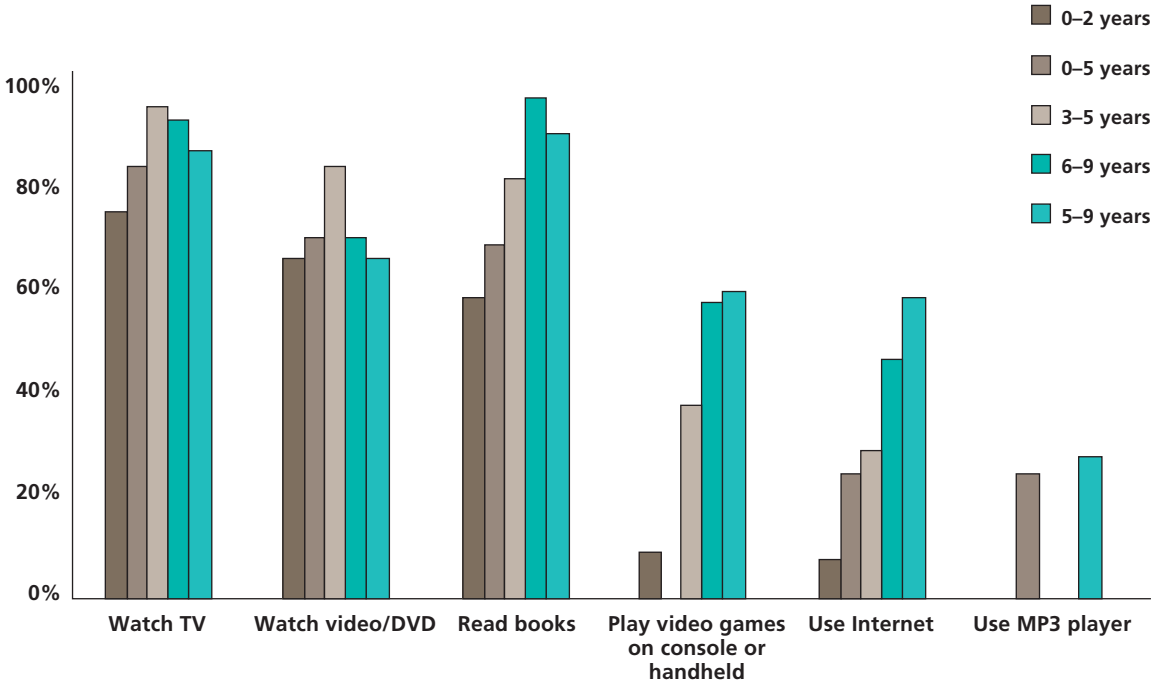
Ask most preschoolers, and they will be able to identify "Snuffy"—Aloysius Snuffleupagus—as well as Big Bird, Bert, Ernie, and a host of other characters: the members of the cast of *Sesame Street*. *Sesame Street* is the most successful television show in history targeted at preschoolers; its audience is in the millions.

But *Sesame Street* is not all that preschoolers are watching or doing, for television, and more recently the Internet and computers, play a central role in many U.S. households. Television, in particular, is one of the most potent and widespread stimuli to which children are exposed, with the average preschooler watching more than 21 hours of TV a week. On the average day, more than 80 percent of preschoolers and toddlers watch TV in the United States, and more than a third of households with children two to seven years of age say that the television is on "most of the time" in their homes. On average, children in the United States ages 2 to 5 watch more than 3½ hours of television a day (see Figure 7-14; Bryant & Bryant, 2001, 2003; Gutnick et al., 2010).

Computers are also becoming influential in the lives of preschoolers. Seventy percent of preschoolers between the ages of four and six have used a computer, and a quarter of

Figure 7-14 Television Time

Television is a nearly universal technology in the United States, whereas only about two-thirds of families with children age 11 or younger have computers. On a typical day, more than 80 percent of toddlers and preschoolers in the United States watch TV, and it remains the most frequently used medium by children from 0 to 11 years of age (Gutnick et al., 2010).



(**Source:** Gutnick, A. L., Robb, M., Takeuchi, L., & Kotler, J. (2010). Always connected: The new digital media habits of young children. New York: The Joan Ganz Cooney Center at Sesame Workshop. p. 15.)

them use one every day. Those who use a computer spend an average of an hour a day in computer activities, and the majority use it by themselves. With help from their parents, almost one-fifth have sent an e-mail (Rideout, Vandewater, & Wartella, 2003; McPake, Plowman, & Stephen, 2013).

It's too early to know the effects of computer usage—and other media such as video games—on preschoolers. However, there is a wealth of research on the consequences of viewing television, as we begin to consider next (Pecora, Murray, & Wartella, 2007).

TELEVISION: CONTROLLING EXPOSURE. Despite the introduction of a number of high-quality educational programs over the past decade, many children's programs are not of high quality or are not appropriate for a preschool audience. Accordingly, the American Academy of Pediatrics recommends that exposure to television should be limited. They suggest that until the age of two, children watch *no* television, and after that age, no more than 1 to 2 hours of quality programming each day. More generally, the AAP recommends that parents should limit combined screen time using television, computers, video games, and DVDs to 2 hours per day in total for preschool children (American Academy of Pediatrics, 2014).

One reason for restricting children's viewing of television relates to the inactivity it produces. Preschoolers who watch more than 2 hours per day of television and videos (or use computers for significant amounts of time) have a significantly higher risk of obesity than those who watch less (Danner, 2008; Jordan & Robinson, 2008; Strasburger, 2009).

What are the limits of preschoolers' "television literacy"? When they do watch television, preschool children often do not fully understand the plots of the stories they are viewing, particularly in longer programs. They are unable to recall significant story

details after viewing a program, and the inferences they make about the motivations of characters are limited and often erroneous. Moreover, preschool children may have difficulty separating fantasy from reality in television programming, with some believing, for example, that there is a real Big Bird living on *Sesame Street* (Rule & Ferguson, 1986; Wright et al., 1994).

Preschool-age children exposed to advertising on television are not able to critically understand and evaluate the messages to which they are exposed. Consequently, they are likely to fully accept advertisers' claims about their product. The likelihood of children believing advertising messages is so high that the American Psychological Association has recommended that advertising targeting children under the age of eight be restricted (Kunkel et al., 2004; Pine, Wilson, & Nash, 2007; Nash, Pine, & Messer, 2009).

In short, the world to which preschoolers are exposed on TV is imperfectly understood and unrealistic. On the other hand, as they get older and their information processing capabilities improve, preschoolers' understanding of the material they see on television improves. They remember things more accurately, and they become better able to focus on the central message of a show. This improvement suggests that the powers of the medium of television may be harnessed to bring about cognitive gains—exactly what the producers of *Sesame Street* set out to do (Singer & Singer, 2000; Crawley, Anderson, & Santomero, 2002; Berry, 2003; Uchikoshi, 2006).

***SESAME STREET*: A TEACHER IN EVERY HOME?** *Sesame Street* is among the most popular educational program for children in the United States. Almost half of all preschoolers in the United States watch the show, and it is broadcast in almost 100 different countries and in 13 foreign languages. Characters like Big Bird and Elmo have become familiar throughout the world to both adults and preschoolers (Bickham, Wright, & Huston, 2000; Cole, Arafat, & Tidhar, 2003).

Sesame Street was devised with the express purpose of providing an educational experience for preschoolers. Its specific goals include teaching letters and numbers, increasing vocabulary, and teaching preliteracy skills. Has *Sesame Street* achieved its goals? Most evidence suggests that it has.

For example, a two-year longitudinal study compared three groups of three- and five-year-olds: those who watched cartoons or other programs, those who watched the same amount of *Sesame Street*, and those who watched little or no TV. Children who watched *Sesame Street* had significantly larger vocabularies than those who watched other programs or those who watched little television. These findings held regardless of the children's gender, family size, and parent education and attitudes. Such findings are consistent with earlier evaluations of the program, which concluded that viewers showed dramatic improvements in skills that were directly taught, such as alphabet recitation, and improvements in other areas that were not directly taught, such as reading words (McGinn, 2002; Oades-Sese et al., 2014).

Formal evaluations of the show find that preschoolers living in lower-income households who watch the show are better prepared for school, and they perform significantly higher on several measures of verbal and mathematics ability at ages six and seven than those who do not watch it. Furthermore, viewers of *Sesame Street* spend more time reading than nonviewers. And by the time they are six and seven, viewers of *Sesame Street* and other educational programs tend to be better readers and are judged more positively by their teachers. The findings for *Sesame Street* are mirrored for other educationally oriented shows, such as *Dora the Explorer* and *Blue's Clues* (Augustyn, 2003; Linebarger, 2005).

More recent evaluations show even more positive findings. In a 2015 study, viewing *Sesame Street* was found to be as valuable as attending preschool. In fact, viewing the show was associated with increases in the likelihood of remaining at appropriate

grade level by several percentage points. The effect was especially strong for boys, African Americans, and children who grow up in disadvantaged areas (Kearney and Levine, 2015).

On the other hand, *Sesame Street* has not been without its critics. For instance, some educators claim that the frenzied pace at which different scenes are shown makes viewers less receptive to the traditional forms of teaching they will experience when they begin school. However, careful evaluations of the program find no evidence that viewing *Sesame Street* leads to declines in enjoyment of traditional schooling. Overall, then, the most recent findings demonstrate quite positive outcomes for viewers of Sesame Street and other educational shows similar to it (Wright et al., 2001; Fisch, 2004; Mendoza, Zimmerman & Christakis, 2007; Penuel et al., 2012).

Early Childhood Education: Taking the "Pre" Out of the Preschool Period

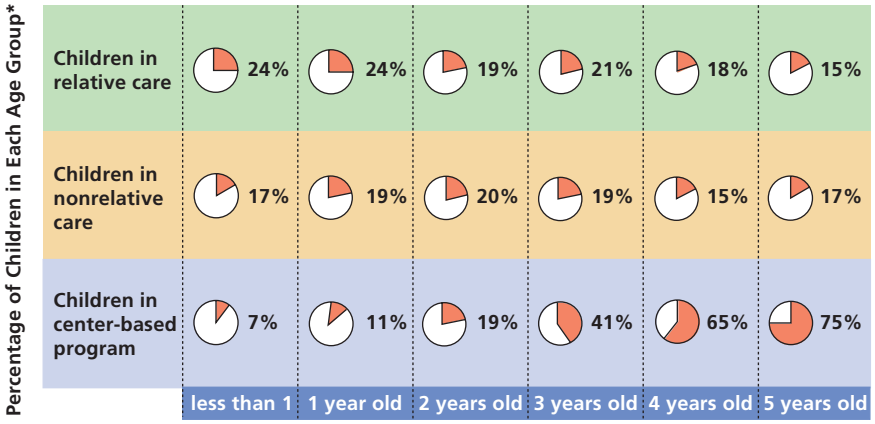
LO 7.9 Distinguish the typical educational programs available to children in the preschool years.

The term *preschool period* is something of a misnomer because many children engage in some form of educational experiences during this period. Almost three-quarters of children in the United States are enrolled in some form of care outside the home, much of which is designed either explicitly or implicitly to teach skills that will enhance intellectual as well as social abilities (see Figure 7-15). There are several reasons for this increase, but one major factor is the rise in the number of families in which both parents work outside the home. For instance, a high proportion of fathers work outside the home, and close to 60 percent of women with children under six are employed, most of them full-time (Gilbert, 1994; Borden, 1998; Tamis-LeMonda & Cabrera, 2002).

However, there is another reason, one less tied to the practical considerations of child care: Developmental psychologists have found increasing evidence that children can benefit substantially from involvement in some form of educational activity before

Figure 7-15 Care Outside the Home

Approximately 75 percent of children in the United States are enrolled in some form of care outside the home—a trend that is the result of more parents employed full time. Evidence suggests that children can benefit from early childhood education.



*Columns do not add up to 100 because some children participated in more than one type of child care.

(**Source:** U.S. Department of Education, National Center for Child Health, 2003.)

they enroll in formal schooling, which typically takes place at age five or six in the United States. When compared to children who stay at home and have no formal educational involvement, those children enrolled in good preschools experience clear cognitive and social benefits (Campbell, Ramey, & Pungello, 2002; Friedman, 2004; National Association for the Education of Young Children, 2005).

THE VARIETIES OF EARLY EDUCATION. The variety of early education alternatives is vast. Some outside-the-home care for children is little more than babysitting, while other options are designed to promote intellectual and social advances. Among the major choices of the latter type are the following:

- *Child-care centers* typically provide care for children outside the home while their parents are at work. (Child-care centers were previously referred to as day-care centers. However, because a significant number of parents work nonstandard schedules and therefore require care for their children at times other than the day, the preferred label has changed to child-care centers.)

  Although many child-care centers were first established as safe, warm environments where children could be cared for and could interact with other children, today their purpose tends to be broader, aimed at providing some form of intellectual stimulation. Still, their primary purpose tends to be more social and emotional than cognitive.

- Some child care is provided in *family child-care centers*, small operations run in private homes. Because centers in some areas are unlicensed, the quality of care can be uneven, and parents should consider whether a family child-care center is licensed before enrolling their children. In contrast, providers of center-based care, which is offered in institutions such as school classrooms, community centers, and churches and synagogues, are typically licensed and regulated by governmental authorities. Because teachers in such programs are more often trained professionals than those who provide family child care, the quality of care is often higher.

- *Preschools* are explicitly designed to provide intellectual and social experiences for children. They tend to be more limited in their schedules than family child-care centers, typically providing care for only three to five hours per day. Because of this limitation, preschools mainly serve children from middle and higher socioeconomic levels, in cases where parents don't need to work full time.

  Like child-care centers, preschools vary enormously in the activities they provide. Some emphasize social skills, whereas others focus on intellectual development. Some do both. For instance, Montessori preschools, which use a method developed by Italian educator Maria Montessori, employ a carefully designed set of materials to create an environment that fosters sensory, motor, and language development. Children are provided with a variety of activities to choose from, with the option of moving from one to another (Gutek, 2003).

  Similarly, in the Reggio Emilia preschool approach—another Italian import—children participate in what is called a negotiated curriculum that emphasizes the joint participation of children and teachers. The curriculum builds on the interests of children, promoting their cognitive development through the integration of the arts and participation in weeklong projects (Hong & Trepanier-Street, 2004; Rankin, 2004; Paolella, 2013).

- *School child care* is provided by some local school systems in the United States. Almost half the states in the United States fund prekindergarten programs for four-year-olds, often aimed at disadvantaged children. Because they typically are staffed by better-trained teachers than less-regulated child-care centers, school child-care programs are often of higher quality than other early education alternatives.

THE EFFECTIVENESS OF CHILD CARE. How effective are such programs? Most research suggests that preschoolers enrolled in child-care centers show intellectual

development that at least matches that of children at home and often is better. For instance, some studies find that preschoolers in child care are more verbally fluent, show memory and comprehension advantages, and even achieve higher IQ scores than at-home children. Other studies find that early and long-term participation in child care is particularly helpful for children from impoverished home environments or who are otherwise at risk. Some research even shows that child-care programs can have positive consequences 25 years later (Vandell, 2004; Mervis, 2011; Reynolds et al., 2011; Vivanti et al., 2014).

Similar advantages are found for social development. Children in high-quality programs tend to be more self-confident, independent, and knowledgeable about the social world in which they live than those who do not participate. On the other hand, not all the outcomes of outside-the-home care are positive: Children in child care have been found to be less polite, less compliant, less respectful of adults, and sometimes more competitive and aggressive than their peers (Clarke-Stewart & Allhusen, 2002; NICHD Early Child Care Research Network, 2003b; Belsky et al., 2007; Douglass & Klerman, 2012).

Another way to consider the effectiveness of child care is to take an economic approach. For instance, one study of prekindergarten education in Texas found that every dollar invested in high-quality preschool programs produced $3.50 in benefits. Benefits included increased graduation rates, higher earnings, savings in juvenile crime, and reductions in child welfare costs (Aguirre et al., 2006).

It is important to keep in mind that not all early childhood care programs are equally effective. As we observed of infant child care in Chapter 6, one key factor is program *quality:* High-quality care provides intellectual and social benefits, while low-quality care not only is unlikely to furnish benefits but actually may harm children (Votruba-Drzal, Coley, & Chase-Lansdale, 2004; NICHD Early Child Care Research Network, 2006; Dearing, McCartney, & Taylor, 2009).

THE QUALITY OF CHILD CARE. How can we define "high quality"? Several characteristics are important; they are analogous to those that pertain to infant child care (see Chapter 6). The major characteristics of high-quality care include the following (Vandell, Shumow, & Posner, 2005; Lavzer & Goodson, 2006; Leach et al., 2008; Rudd, Cain, & Saxon, 2008; Lloyd, 2012):

- The care providers are well trained, preferably with bachelor's degrees.
- The child-care center has an appropriate overall size and ratio of care providers to children. Single groups should not have many more than 14 to 20 children, and there should be no more than 5 to 10 three-year-olds per caregiver, or 7 to 10 four- or five-year-olds per caregiver.
- The child–teacher ratio should be 10:1 or better.
- The curriculum of a child-care facility is carefully planned out and coordinated among the teachers.
- The language environment is rich, with a great deal of conversation.
- The caregivers are sensitive to children's emotional and social needs, and they know when and when not to intervene.
- Materials and activities are age appropriate.
- Basic health and safety standards are followed.
- Children should be screened for vision, hearing, and health problems.
- At least one meal a day should be served.
- The facility should provide at least one family support service.

No one knows how many programs in the United States can be considered "high quality," but there are many fewer than desirable. In fact, the United States lags behind almost every other industrialized country in the quality of its child care as well as in its quantity and affordability as we discuss further in the *Developmental Diversity and Your Life* feature (Muenchow & Marsland, 2007; Pianta et al., 2009).

Developmental Diversity and Your Life

Preschools around the World: Why Does the United States Lag Behind?

In France and Belgium, access to preschool is a legal right. Sweden and Finland provide child care for preschoolers whose parents want it. Russia has an extensive system of state-run *yasli-sads*, nursery schools and kindergartens, attended by 75 percent of children age three to seven in urban areas.

In contrast, the United States has no coordinated national policy on preschool education—or on the care of children in general. There are several reasons for this. For one, decisions about education have traditionally been left to the states and local school districts. For another, the United States has no tradition of teaching preschoolers, unlike other countries in which preschool-age children have been enrolled in formal programs for decades. Finally, the status of preschools in the United States has been traditionally low. Consider, for instance, that preschool and nursery school teachers are the lowest paid of all teachers. (Teacher salaries increase as the age of students rises. Thus, college and high school teachers are paid the highest salaries, while preschool and elementary school teachers are paid the lowest salaries.)

Preschools also differ significantly from one country to another, according to differing societal views of the purpose of early childhood education (Lamb et al., 1992). For instance, in a cross-country comparison of preschools in China, Japan, and the United States, researchers found that parents in the three countries view the purpose of preschools very differently. Whereas parents in China tend to see preschools primarily as a way of giving children a good start academically, Japanese parents view them primarily as a way of giving children the opportunity to be members of a group. In the United States, in comparison, parents regard the primary purpose of preschools as making children more independent and self-reliant, although obtaining a good academic start and having group experience are also important (Huntsinger et al., 1997; Johnson et al., 2003).

PREPARING PRESCHOOLERS FOR ACADEMIC PURSUITS: DOES HEAD START TRULY PROVIDE A HEAD START? Although many programs designed for preschoolers focus primarily on social and emotional factors, some are geared primarily toward promoting cognitive gains and preparing preschoolers for the more formal instruction they will experience when they start kindergarten. In the United States, the best-known program designed to promote future academic success is Head Start. Born in the 1960s when the United States declared a War on Poverty, the program has served over 30 million children and their families; each year, nearly 1 million children aged three and four are in Head Start. The program, which stresses parental involvement, was designed to serve the "whole child," including children's physical health, self-confidence, social responsibility, and social and emotional development (Gupta et al., 2009; Zhai, Raver, & Jones, 2012; Office of Head Start, 2015).

Whether Head Start is seen as successful or not depends on the lens through which one is looking. If, for instance, the program is expected to provide long-term increases in IQ scores, it is a disappointment. Although graduates of Head Start programs tend to show immediate IQ gains, these increases do not last.

On the positive side, it is clear that Head Start is meeting its goal of getting preschoolers ready for school. Preschoolers who participate in Head Start are better prepared for future schooling—in terms of health, social, emotional, and cognitive factors—than those who do not. Furthermore, graduates of Head Start programs have better future school adjustment than their peers, and they are less likely to be in special education classes or to be retained in their grade. Finally, some research suggests that Head Start graduates even show higher academic performance at the end of high school, although the gains are modest (Brooks-Gunn, 2003; Kronholz, 2003; Bierman et al., 2009; Mervis, 2011b).

In addition to Head Start programs, other types of preschool readiness programs also provide advantages throughout the school years. Studies show that those who participate and graduate from such preschool programs are less likely to repeat grades, and they complete school more frequently than those who are not in the programs. Preschool

readiness programs also appear to be cost-effective. According to a cost-benefit analysis of one readiness program, for every dollar spent on the program, taxpayers saved seven dollars by the time the graduates reached the age of 27 (Friedman, 2004; Gormley et al., 2005; Lee et al., 2014).

The most recent comprehensive evaluation of early intervention programs suggests that, taken as a group, they can provide significant benefits and that government funds invested early in life may ultimately lead to a reduction in future costs. For instance, compared with children who did not participate in early intervention programs, participants in various programs showed gains in emotional or cognitive development, better educational outcomes, increased economic self-sufficiency, reduced levels of criminal activity, and improved health-related behaviors. Although not every program produced all these benefits, and not every child benefited to the same extent, the results of the evaluation suggested that the potential benefits of early intervention can be substantial (NICHD Early Child Care Research Network & Duncan, 2003; Love et al., 2006; Izard et al., 2008; Mervis, 2011a).

ARE WE PUSHING CHILDREN TOO HARD AND TOO FAST? Not everyone agrees that programs that seek to enhance academic skills during the preschool years are a good thing. According to developmental psychologist David Elkind, U.S. society tends to push children so rapidly that they begin to feel stress and pressure at a young age (Elkind, 2007).

Elkind argues that academic success is largely dependent on factors out of parents' control, such as inherited abilities and a child's rate of maturation. Consequently, children of a particular age cannot be expected to master educational material without taking into account their current level of cognitive development. In short, children require **developmentally appropriate educational practice**, which is education that is based on both typical development and the unique characteristics of a given child (Robinson & Stark, 2005; also see the *From Research to Practice* box).

developmentally appropriate educational practice
education that is based on both typical development and the unique characteristics of a given child

From Research to Practice

Reading to Children: Keeping It Real

Everyone knows that story time benefits young children—you can't start reading to them too early or do it too often. The American Academy of Pediatrics (AAP) advises pediatricians to recommend that parents read aloud to their children from birth, and to do it every day. Pointing to research that shows that children who hear more spoken words at home do better at school, the pediatricians' group has made reading advocacy part of their policy. But the digital era raises a new question: Does it matter if the books are physical or electronic (American Academy of Pediatrics, 2014; Rich, 2014)?

It's a bigger issue than it seems. New digital reader apps are being released all the time, pushing the technology in new directions. Electronic children's books don't just have words and pictures anymore; increasingly, they include games, animations, choice points, tutorials, and other interactive elements that enhance the experience but also break up the continuity of the story and produce distractions. Children can use them without the aid of an adult, turning them into something more akin to a computer game with a story line than a book. The AAP recommends restricting all forms of screen time for young children and not providing any at all to those under 2 (Quenqua, 2014).

So does the form of the book matter? Early research suggests that it does. An adult reading a physical book to a child provides a qualitatively different kind of experience from digital readers: it's real-time responsive interaction—a kind of conversation—rather than a canned presentation. The parent can respond accordingly when the child seems confused or bored, or becomes excited or amused. The parent and child can discuss the story as it unfolds in ways that relate to the child's own unique understandings and experiences, and this back-and-forth enhances the child's linguistic development. It's not just the story itself that matters—it's the conversations and interactions that come with it. By contrast, children using digital readers—even with a parent facilitating—act more like they are playing with a game, focusing on the device itself and their manipulation of it. The low-tech books keep the focus where it belongs: on the story, and on the sharing of it (Parish-Morris, Mahajan, Hirsh-Pasek, Golinkoff, & Collins, 2013).

Shared Writing Prompt

If parental interaction is such an important part of reading time, what do you think the book adds? That is, why is reading different from merely talking?

From *an educator's* perspective

Do you accept the view that children in U.S. society are "pushed" academically to the extent that they feel too much stress and pressure at a young age? Why?

Rather than arbitrarily expecting children to master material at a particular age, Elkind suggests that a better strategy is to provide an environment in which learning is encouraged but not pushed. By creating an atmosphere in which learning is facilitated—for instance, by reading to preschoolers—parents will allow children to proceed at their own pace rather than at one that pushes them beyond their limits (Reese & Cox, 1999; van Kleeck & Stahl, 2003).

Although Elkind's suggestions are appealing—it is certainly hard to disagree that increases in children's anxiety levels and stress should be avoided—they are not without their detractors. For instance, some educators have argued that pushing children is largely a phenomenon of the middle and higher socioeconomic levels, possible only if parents are relatively affluent. For poorer children, whose parents may not have substantial resources available to push their children nor the easy ability to create an environment that promotes learning, the benefits of formal programs that promote learning are likely to outweigh their drawbacks. Furthermore, developmental researchers have found that there are ways for parents to prepare their children for future educational success.

Module 7.3 Review

- In the preschool years, children rapidly increase in linguistic ability, developing an improved sense of grammar and shifting gradually from private to social speech. Poverty can affect children's language development by limiting the opportunities for parents and other caregivers to interact linguistically with children.
- Preschoolers watch television at high levels. The effects of television on preschoolers are mixed, with benefits from some programs and clear disadvantages due to other aspects of viewing.
- Preschool educational programs are beneficial if they are of high quality, with trained staff, good curriculum, proper group sizes, and small staff-to-student ratios. Preschool children are likely to benefit from a developmentally appropriate, individualized, and supportive environment for learning.

Journal Writing Prompt

Applying Lifespan Development: Imagine that you are the parent of a preschooler. What have you learned in this module that might improve your parenting?

Epilogue

In this chapter, we looked at children in the preschool years, focusing on their physical development, growth, nutritional needs, overall health, brain growth, and advances in gross and fine motor skills. We discussed cognitive development from the Piagetian perspective, with its description of the characteristics of thought in the preoperational stage, and from the perspective of information processing theorists and Lev Vygotsky, who emphasized the social and cultural influences on cognitive development. We then discussed the burst in linguistic ability that occurs during the preschool years and the influence of television on preschoolers' development. We concluded with a discussion of preschool education and its effects.

Before moving on to a discussion of children's social and personality development in the next chapter, turn back for a moment to this chapter's prologue, which describes a field trip Corinne Green took with her preschool class. Consider these questions:

1. Were the games Green selected to play on the bus a good match developmentally for the children? Explain your answer in terms of motor, sensory, and brain development.
2. What recent changes in Su-Yun Davis's brain make it possible for her to recall the details of a visit to a farm with her family four months before?
3. Explain the stages of fine motor development that Danny Brock has likely passed through to be able to draw recognizable cows, horses, and pigs.
4. What dangers should a preschool teacher anticipate on a field trip to a farm? What steps can he or she take before and during the trip to keep the children safe?

Looking Back

LO 7.1 Describe a child's bodily growth and overall health risks during the preschool years.

In addition to gaining height and weight, the bodies of preschool children undergo changes in shape and structure. Children grow more slender, and their bones and muscles strengthen. Children in the preschool years are generally quite healthy. Obesity in these years is caused by genetic and environmental factors. The greatest health threats are accidents and environmental factors.

LO 7.2 Summarize how preschool children's brains develop.

Brain growth is particularly rapid during the preschool years, with the number of interconnections among cells and the amount of myelin around neurons increasing greatly. The halves of the brain begin to specialize in somewhat different tasks—a process called lateralization.

LO 7.3 Explain how preschool children's motor skills develop.

Both gross and fine motor skills advance rapidly during the preschool years. Gender differences begin to emerge, fine motor skills are honed, and handedness begins to assert itself.

LO 7.4 Summarize how Piaget explains cognitive development during the preschool years.

During the stage that Piaget has described as *preoperational*, children are not yet able to engage in organized, formal, logical thinking. However, their development of symbolic function permits quicker and more effective thinking as they are freed from the limitations of sensorimotor learning. According to Piaget, children in the preoperational stage engage in intuitive thought for the first time, actively applying rudimentary reasoning skills to the acquisition of world knowledge.

LO 7.5 Summarize the information-processing approaches to cognitive development in the preschool years.

A different approach to cognitive development is taken by proponents of information processing theories, who focus on preschoolers' storage and recall of information and on quantitative changes in information processing abilities (such as attention).

LO 7.6 Describe Vygotsky's view of cognitive development in the preschool years.

Lev Vygotsky proposed that the nature and progress of children's cognitive development are dependent on the children's social and cultural context.

LO 7.7 Explain how children's language develops in the preschool years.

Children rapidly progress from two-word utterances to longer, more sophisticated expressions that reflect their growing vocabularies and emerging grasp of grammar. The development of linguistic abilities is affected by socioeconomic status. The result can be lowered linguistic—and, ultimately, academic—performance by poorer children.

LO 7.8 Summarize the effects television and other media have on preschoolers.

The effects of television are mixed. Preschoolers' sustained exposure to emotions and situations that are not representative of the real world have raised concerns. On the other hand, preschoolers can derive meaning from such targeted programs as *Sesame Street*, which are designed to bring about cognitive gains.

LO 7.9 Distinguish the typical educational programs available to children in the preschool years.

Early childhood educational programs, offered as center-based or school-based child care or as preschool, can lead to cognitive and social advances. The United States lacks a coordinated national policy on preschool education. The major federal initiative in U.S. preschool education has been the Head Start program, which has yielded mixed results.

Key Terms and Concepts

obesity 231
myelin 234
lateralization 236
handedness 240
preoperational stage 241
operations 241
centration 242
conservation 243
transformation 245
egocentric thought 245
intuitive thought 246
autobiographical memory 248
scripts 248
zone of proximal development (ZPD) 250
scaffolding 251
syntax 254
fast mapping 254
grammar 254
private speech 254
pragmatics 254
social speech 255
developmentally appropriate educational practice 263

Chapter 8

Social and Personality Development in the Preschool Years

Learning Objectives

LO 8.1 Describe the major developmental challenges that preschool-age children face.

LO 8.2 Explain how preschool-age children develop a concept of themselves.

LO 8.3 Explain how preschool-age children develop a sense of racial identity and gender.

LO 8.4 Describe the sorts of social relationships that preschool-age children engage in.

LO 8.5 Explain how and why preschool-age children play.

LO 8.6 Summarize how thinking changes in the preschool years.

LO 8.7 Describe ways in which family relationships affect the development of preschool-age children.

LO 8.8 Describe the kinds of disciplinary styles parents employ with preschool-age children and what effects they have.

LO 8.9 List the factors that contribute to child abuse and neglect.

LO 8.10 Define resilience, and describe how it can help abused children.

LO 8.11 Explain how preschool-age children develop a moral sense.

LO 8.12 Describe how aggression develops in preschool-age children.

Chapter Overview

Prologue: A Helping Hand

Four-year-old Lora Gray watches her mother prepare a casserole to take to a neighbor who has just returned from the hospital. When Lora asks why her mom is bringing food to the lady across the street, her mother explains that when people are having a hard time, it's nice to help them out by making meals or running their errands.

An hour later, Lora's friend Rosa comes over to play. Rosa is unusually quiet and solemn. Lora asks if she is sad, and Rosa says her grandma is dying. Lora thinks for a minute, then suggests singing. "I'm a great singer," she tells Rosa, "but I sing even better with a friend." Lora's mom puts on a CD and soon the girls are singing, dancing, and laughing. When Rosa leaves, Lora says, "I knew music would help Rosa. Music makes everyone happy." ■

Looking Ahead

Lora's effort to cheer up her friend is an example of the growing ability of preschool-age children to understand the emotions of others.

In this chapter, we address social and personality development during the preschool period, a time of enormous growth and change. We begin by examining how preschool-age children continue to form a sense of self, focusing on how they develop their self-concepts. We especially examine issues of self relating to gender, a central aspect of children's views of themselves and others.

Preschoolers' social lives are the focus of the next part of the chapter. We look at how children play with one another, examining the various types of play. We consider how parents and other authority figures use discipline to shape children's behavior.

Finally, we examine two key aspects of preschool-age children's social behavior: moral development and aggression. We consider how children develop a notion of right and wrong and how that development can lead them to be helpful to others. We also look at the other side of the coin—aggression—and examine the factors that lead preschool-age children to behave in a way that hurts others. We end on an optimistic note: considering how we may help preschool-age children to be more moral and less aggressive individuals.

During the preschool years, a child's ability to understand others' emotions begins to grow.

Forming a Sense of Self

Although the question "Who am I?" is not explicitly posed by most preschool-age children, it underlies a considerable amount of development during the preschool years. During this period, children wonder about the nature of the self, and the way they answer the "Who am I?" question may affect them for the rest of their lives.

Psychosocial Development: Resolving the Conflicts

LO 8.1 **Describe the major developmental challenges that preschool-age children face.**

> *Mary-Alice's preschool teacher raised her eyebrows slightly when the four-year-old took off her coat. Mary-Alice, usually dressed in well-matched playsuits, was a medley of prints. She had on a pair of flowered pants along with a completely clashing plaid top. The outfit was accessorized with a striped headband, socks in an animal print, and Mary-Alice's polka-dotted rain boots. Mary-Alice's mom gave a slightly embarrassed shrug. "Mary-Alice got dressed all by herself this morning," she explained as she handed over a bag containing spare shoes, just in case the rain boots became uncomfortable during the day.*

Psychoanalyst Erik Erikson may well have praised Mary-Alice's mother for helping Mary-Alice develop a sense of initiative (if not of fashion). The reason: Erikson (1963) suggested that, during the preschool years, children face a key conflict relating to psychosocial development that involves the development of initiative.

psychosocial development
according to Erikson, development that encompasses changes both in the understanding individuals have of themselves as members of society and in their comprehension of the meaning of others' behavior

As we discussed in Chapter 6, **psychosocial development** encompasses changes in individuals' understanding of both themselves and others' behavior. According to Erikson, society and culture present the developing person with particular challenges, which shift as people age. Erikson believed that people pass through eight distinct stages, each characterized by a crisis or conflict that the person must resolve. Our experiences as we try to resolve these conflicts lead us to develop ideas about ourselves that can last for the rest of our lives.

In the early part of the preschool period, children are ending the autonomy-versus-shame-and-doubt stage, which lasts from around 18 months to 3 years. In this period, children either become more independent and autonomous if their parents encourage exploration and freedom or they experience shame and self-doubt if they are restricted and overprotected.

initiative-versus-guilt stage
according to Erikson, the period during which children aged three and six years experience conflict between independence of action and the sometimes negative results of that action

The preschool years largely encompass what Erikson called the **initiative-versus-guilt stage**, which lasts from around age three to age six. During this period, children's views of themselves change as preschool-age children face conflicts between, on the one hand, the desire to act independently of their parents and do things on their own, and, on the other hand, the guilt that comes from failure when they don't succeed. They are eager to do things on their own ("Let *me* do it" is a popular refrain among preschoolers), but they feel guilt if their efforts fail. They come to see themselves as persons in their own right, and they begin to make decisions on their own.

Deciding what clothes to wear can be part of the initiative-versus-guilt stage for preschool-age children.

From *a child-care provider's* perspective

How would you relate Erikson's stages of trust versus mistrust, autonomy versus shame and doubt, and initiative versus guilt to the issue of secure attachment discussed in an earlier chapter?

Parents, such as Mary-Alice's mother, who react positively to this transformation toward independence can help their children resolve the opposing feelings that are characteristic of this period. By

providing their children with opportunities to act self-reliantly, while still giving them direction and guidance, parents can support and encourage their children's initiative. On the other hand, parents who discourage their children's efforts to seek independence may contribute to a sense of guilt that persists throughout their lives as well as affects their self-concept, which begins to develop during this period.

Self-Concept in the Preschool Years: Thinking about the Self

LO 8.2 Explain how preschool-age children develop a concept of themselves.

If you ask preschool-age children to specify what makes them different from other kids, they readily respond with answers like "I'm a good runner" or "I like to color" or "I'm a big girl." Such answers relate to **self-concept**—their identity, or their set of beliefs about what they are like as individuals (Brown, 1998; Marsh, Ellis, & Craven, 2002; Bhargava, 2014).

self-concept
a person's identity, or set of beliefs about what one is like as an individual

The statements that describe children's self-concepts are not necessarily accurate. In fact, preschool children typically overestimate their skills and knowledge across all domains of expertise. Consequently, their view of the future is quite rosy: They expect to win the next game they play, to beat all opponents in an upcoming race, to write great stories when they grow up. Even when they have just experienced failure at a task, they are likely to expect to do well in the future. This optimistic view is held, in part, because they have not yet started to compare themselves and their performance against others. Their inaccuracy is also helpful, freeing them to take chances and try new activities (Wang, 2004; Verschueren, Doumen, & Buyse, 2012; Ehm, Lindberg, & Hasselhorn, 2013).

Preschool-age children's view of themselves also reflects the way their particular culture considers the self. For example, many Asian societies tend to have a **collectivistic orientation**, promoting the notion of interdependence. People in such cultures tend to regard themselves as parts of a larger social network in which they are interconnected with and responsible to others. In contrast, children in Western cultures are more likely to develop a view of the self, reflecting an **individualistic orientation** that emphasizes personal identity and the uniqueness of the individual. They are more apt to see themselves as self-contained and autonomous, in competition with others for scarce resources. Consequently, children in Western cultures are more likely to focus on what sets them apart from others—what makes them special.

collectivistic orientation
a philosophy that promotes the notion of interdependence

individualistic orientation
a philosophy that emphasizes personal identity and the uniqueness of the individual

Such views pervade a culture, sometimes in subtle ways. For instance, one well-known saying in Western cultures states that "the squeaky wheel gets the grease." Preschoolers who are exposed to this perspective are encouraged to gain the attention of others by standing out and making their needs known. On the other hand, children in Asian cultures are exposed to a different perspective; they are told that "the nail that stands out gets pounded down." This perspective suggests to preschoolers that they should attempt to blend in and refrain from making themselves distinctive (Dennis et al., 2002; Lehman, Chiu, & Schaller, 2004; Wang, 2004, 2006).

Racial, Ethnic, and Gender Awareness

LO 8.3 Explain how preschool-age children develop a sense of racial identity and gender.

During the preschool period, children's sense of who they are becomes more refined. Two particularly important aspects involve race and gender.

RACIAL IDENTITY: DEVELOPING SLOWLY. Preschoolers' developing self-concepts can also be affected by their culture's attitudes toward various racial and ethnic groups. As we'll see in the Developmental Diversity and Your Life feature, preschoolers' awareness of their ethnic or racial identity develops slowly and is subtly influenced by the attitudes

Developmental Diversity and Your Life

Developing Racial and Ethnic Awareness

The preschool years mark an important turning point for children. Their answer to the question of who they are begins to take into account their racial and ethnic identity.

For most preschool-age children, racial awareness comes relatively early. Certainly, even infants are able to distinguish different skin colors; their perceptual abilities allow for such color distinctions quite early in life. However, it is only later that children begin to attribute meaning to different racial characteristics.

By the time they are three or four years of age, preschool-age children notice differences among people based on skin color, and they begin to identify themselves as a member of a particular group, such as "Hispanic" or "black." Although early in the preschool years they do not realize that ethnicity and race are enduring features of who they are, later they begin to develop an understanding of the significance that society gives to ethnic and racial membership (Hall & Rowan, 2003; Cross & Cross, 2008; Quintana & McKown, 2008).

Some preschoolers have mixed feelings about their racial and ethnic identity. Some experience **race dissonance**, the phenomenon in which minority children indicate preferences for majority values or people. For instance, some studies find that as many as 90 percent of African American children, when asked about their reactions to drawings of black and white children, react more negatively to the drawings of black children than to those of white children. However, these negative reactions did not translate into lower self-esteem for the African American subjects. Instead, their preferences appear to be a result of the powerful influence of the dominant white culture, rather than a disparagement of their own racial characteristics (Holland, 1994; Quintana, 2007).

Ethnic identity emerges somewhat later than racial identity because it is usually less conspicuous than race. For instance, in one study of Mexican American ethnic awareness, preschoolers displayed only a limited knowledge of their ethnic identity. However, as they became older, they grew more aware of the significance of their ethnicity. Preschoolers who were bilingual, speaking both Spanish and English, were most apt to be aware of their ethnic identity (Bernal, 1994; Quintana et al., 2006; Grey & Yates, 2014).

race dissonance
the phenomenon in which minority children indicate preferences for majority values or people

of the people, schools, and other cultural institutions with which they come into contact in their community.

GENDER IDENTITY: DEVELOPING FEMALENESS AND MALENESS

> *Boys' awards: Very Best Thinker, Most Eager Learner, Most Imaginative, Most Enthusiastic, Most Scientific, Best Friend, Mr. Personality, Hardest Worker, Best Sense of Humor.*
> *Girls' awards: All-Around Sweetheart, Sweetest Personality, Cutest Personality, Best Sharer, Best Artist, Biggest Heart, Best Manners, Best Helper, Most Creative.*

What's wrong with this picture? To one parent, whose daughter received one of the girls' awards during a kindergarten graduation ceremony, quite a bit. While the girls were getting pats on the back for their pleasing personalities, the boys were receiving awards for their intellectual and analytic skills (Deveny, 1994).

Such a situation is not rare: Girls and boys often live in very different worlds. Differences in the ways males and females are treated begin at birth, continue during the preschool years, and—as we'll see later—extend into adolescence and beyond (Bornstein et al., 2008; Brinkman et al., 2014).

Gender, the sense of being male or female, is well established by the time children reach the preschool years. (As we first noted in Chapter 6, "gender" and "sex" do not mean the same thing. *Sex* typically refers to sexual anatomy and sexual behavior, whereas *gender* refers to the perception of maleness or femaleness related to membership in a given society.) By the age of two, children consistently label themselves and those around them as male or female (Raag, 2003; Campbell, Shirley, & Candy, 2004).

One way gender shows up is in play. Preschool boys spend more time than girls in rough-and-tumble play, while preschool girls spend more time than boys in organized games and role-playing. During this time boys begin to play more with boys, and girls play more with girls, a trend that increases during middle childhood. Girls begin to prefer same-sex playmates a little earlier than boys. They first have a clear preference

During the preschool period, differences in play according to gender become more pronounced. In addition, boys tend to play with boys, and girls with girls.

for interacting with other girls at age two, while boys don't show much preference for same-sex playmates until age three (Martin & Fabes, 2001; Raag, 2003).

Such same-sex preferences appear in many cultures. For instance, studies of kindergartners in mainland China show no examples of mixed-gender play. Similarly, gender "outweighs" ethnic variables when it comes to play: A Hispanic boy would rather play with a white boy than with a Hispanic girl (Whiting & Edwards, 1988; Aydt & Corsaro, 2003).

Preschool-age children often have very strict ideas about how boys and girls are supposed to act. Their expectations about gender-appropriate behavior are even more gender-stereotyped than those of adults and may be less flexible during the preschool years than at any other point in the life span. Beliefs in gender stereotypes become increasingly pronounced up to age five, and although they become somewhat less rigid by age seven, they do not disappear. In fact, the gender stereotypes held by preschoolers resemble those held by traditional adults in society (Lam & Leman, 2003; Ruble et al., 2007; Halim, Ruble, & Tamis-LeMonda, 2013).

From *a child-care provider's* perspective

If a girl in a preschool child-care setting loudly tells a boy that he can't play with the dolls in the play area because he's a boy, what is the best way to handle the situation?

And what is the nature of preschoolers' gender expectations? Like adults, preschoolers expect that males are more apt to have traits involving competence, independence, forcefulness, and competitiveness. In contrast, females are viewed as more likely to have traits such as warmth, expressiveness, nurturance, and submissiveness. Although these are *expectations*, and say nothing about the way that men and women actually behave, such expectations provide the lens through which preschool-age children view the world and thus affect their behavior as well as the way they interact with peers and adults (Blakemore, 2003; Gelman, Taylor, & Nguyen, 2004; Martin & Dinella, 2012).

The prevalence and strength of preschoolers' gender expectations, and differences in behavior between boys and girls, have proven puzzling. Why should gender play such a powerful role during the preschool years (as well as during the rest of the life span)? Developmentalists have proposed several explanations, including the biological and psychoanalytic perspectives.

BIOLOGICAL PERSPECTIVES ON GENDER. Since gender relates to the sense of being male or female, and sex refers to the physical characteristics that differentiate males and females, it would hardly be surprising to find that the biological characteristics associated with sex might themselves lead to gender differences. This has been shown to be true.

Hormones are one sex-related biological characteristic that have been found to affect gender-based behaviors. Girls exposed to unusually high levels of *androgens* (male hormones) prenatally are more likely to display behaviors associated with male stereotypes than are their sisters who were not exposed to androgens (Knickmeyer & Baron-Cohen, 2006; Burton et al., 2009; Mathews et al., 2009).

Androgen-exposed girls preferred boys as playmates and spent more time than other girls playing with toys associated with the male role, such as cars and trucks. Similarly, boys exposed prenatally to atypically high levels of female hormones are apt to display more behaviors that are stereotypically female than is usual (Servin et al., 2003; Knickmeyer & Baron-Cohen, 2006).

Moreover, some research suggests that biological differences exist in the structure of female and male brains. For instance, part of the *corpus callosum*, the bundle of nerves that connects the hemispheres of the brain, is proportionally larger in women than in men. To some theoreticians, evidence such as this suggests that gender differences may be produced by biological factors like hormones (Westerhausen et al., 2004).

Before accepting such contentions, however, it is important to note that alternative explanations abound. For example, it may be that the corpus callosum is proportionally larger in women as a result of certain kinds of experiences that influence brain growth in particular ways. We know that girls are spoken to more than boys as infants, which might produce certain kinds of brain development. If this is true, environmental experience produces biological change—and not the other way around.

Other developmentalists see gender differences as serving the biological goal of survival of the species through reproduction. Basing their work on an evolutionary approach, these theorists suggest that our male ancestors who showed more stereotypically masculine qualities, such as forcefulness and competitiveness, may have been able to attract females who were able to provide them with hardy offspring. Females who excelled at stereotypically feminine tasks, such as nurturing, may have been valuable partners because they could increase the likelihood that children would survive the dangers of childhood (Browne, 2006; Ellis, 2006).

As in other domains that involve the interaction of inherited biological characteristics and environmental influences, it is difficult to attribute behavioral characteristics unambiguously to biological factors. Because of this problem, we must consider other explanations for gender differences.

PSYCHOANALYTIC PERSPECTIVES. You may recall from Chapter 1 that Freud's psychoanalytic theory suggests that we move through a series of stages related to biological urges. To Freud, the preschool years encompass the *phallic stage*, in which the focus of a child's pleasure relates to genital sexuality.

Freud argued that the end of the phallic stage is marked by an important turning point in development: the Oedipal conflict. According to Freud, the *Oedipal conflict* occurs at around the age of five, when the anatomical differences between males and females become particularly evident. Boys begin to develop sexual interests in their mothers, viewing their fathers as rivals.

As a consequence, boys conceive a desire to kill their fathers—just as Oedipus did in the ancient Greek tragedy. However, because they view their fathers as all-powerful, boys develop a fear of retaliation, which takes the form of *castration anxiety*. In order to overcome this fear, boys repress their desires for their mothers and instead begin to identify with their fathers, attempting to be as similar to them as possible. **Identification** is the process in which children attempt to be similar to their same-sex parent, incorporating the parent's attitudes and values.

identification
the process in which children attempt to be similar to their same-sex parent, incorporating the parent's attitudes and values

Girls, according to Freud, go through a different process. They begin to feel sexual attraction toward their fathers and experience *penis envy*—a view that not unexpectedly has led to accusations that Freud viewed women as inferior to men. In order to resolve

their penis envy, girls ultimately identify with their mothers, attempting to be as similar to them as possible.

In the cases of both boys and girls, the ultimate result of identifying with the same-sex parent is that the children adopt their parents' gender attitudes and values. In this way, says Freud, society's expectations about the ways females and males "ought" to behave are perpetuated into new generations.

You may find it difficult to accept Freud's elaborate explanation of gender differences. So do most developmentalists, who believe that gender development is best explained by other mechanisms. In part, they base their criticisms of Freud on the lack of scientific support for his theories. For example, children learn gender stereotypes much earlier than the age of five. Furthermore, this learning occurs even in single-parent households. However, some aspects of psychoanalytic theory have been supported, such as findings indicating that preschool-age children whose same-sex parents support sex-stereotyped behavior tend to demonstrate that behavior also. Still, far simpler processes can account for this phenomenon, and many developmentalists have searched for explanations of gender differences other than Freud's (Martin & Ruble, 2004).

SOCIAL LEARNING APPROACHES. As their name implies, social learning approaches see children as learning gender-related behavior and expectations by observing others. Children watch the behavior of their parents, teachers, siblings, and even peers. A little boy sees the glory of a major league baseball player and becomes interested in sports. A little girl watches her high school neighbor practicing cheerleading moves and begins to try them herself. The observation of the rewards that these others attain for acting in a gender-appropriate manner leads the children to conform to such behavior themselves (Rust et al., 2000).

Books and the media, and in particular television and video games, also play a role in perpetuating traditional views of gender-related behavior from which preschoolers may learn. Analyses of the most popular television shows, for example, find that male characters outnumber female characters by two to one. Furthermore, females are more apt to appear with males, whereas female–female relationships are relatively uncommon (Calvert et al., 2003).

Television also presents men and women in traditional gender roles. Television shows typically define female characters in terms of their relationships with males. Females are more likely to appear as victims than males. They are less likely to be presented as productive or as decision makers and more likely to be portrayed as characters

According to social learning approaches, children learn gender-related behavior and expectations from their observations of others.

interested in romance, their homes, and their families. Such models, according to social learning theory, are apt to have a powerful influence on preschoolers' definitions of appropriate behavior (Scharrer et al., 2006; Hust, Brown, & L'Engle, 2008; Nassif & Gunter, 2008).

In some cases, learning of social roles does not involve models but occurs more directly. For example, many of us may have heard preschool-age children being told by their parents to act like a "little lady" or "man." What this generally means is that girls should behave politely and courteously or that boys should be tough and stoic—traits associated with society's traditional stereotypes of women and men. Such direct training sends a clear message about the behavior expected of a preschool-age child (Leaper, 2002; Williams, Sheridan, & Sandberg, 2014).

COGNITIVE APPROACHES. In the view of some theorists, one aspect of preschoolers' desire to form a clear sense of identity is the wish to establish a **gender identity**, a perception of themselves as male or female. To do this, they develop a **gender schema**, a cognitive framework that organizes information relevant to gender (Martin & Ruble, 2004; Signorella & Frieze, 2008; Halim et al., 2013).

gender identity
the perception of oneself as male or female

gender schema
a cognitive framework that organizes information relevant to gender

Gender schemas are developed early in life and serve as a lens through which preschoolers view the world. For instance, preschoolers use their increasing cognitive abilities to develop "rules" about what is appropriate and what is inappropriate for males and females. Thus, some girls decide that wearing pants is inappropriate for a female and apply the rule so rigidly that they refuse to wear anything but dresses. Or a preschool boy may reason that because makeup is typically worn by females, it is inappropriate for him to wear makeup even when he is in a preschool play and all the other boys and girls are wearing it (Frawley, 2008).

According to *cognitive-developmental theory*, proposed by Lawrence Kohlberg, this rigidity is in part a reflection of preschoolers' understanding of gender (Kohlberg, 1966). Rigid gender schemas are influenced by the preschooler's erroneous beliefs about sex differences. Specifically, young preschoolers believe that sex differences are based not on biological factors but on differences in appearance or behavior. Employing this view of the world, a girl may reason that she can be a father when she grows up, or a boy may think he could turn into a girl if he put on a dress and tied his hair in a ponytail. However, by the time they reach the age of four or five, children develop an understanding of **gender constancy**, the awareness that people are permanently males or females, depending on fixed, unchangeable biological factors.

gender constancy
the belief that people are permanently males or females, depending on fixed, unchangeable biological factors

Interestingly, research on children's growing understanding of gender constancy during the preschool period indicates that it has no particular effect on gender-related behavior. In fact, the appearance of gender schemas occurs well before children understand gender constancy. Even young preschool-age children assume that certain behaviors are appropriate—and others are not—on the basis of stereotypic views of gender (Ruble et al., 2007; Karniol, 2009; Halim et al., 2014).

Is it possible to avoid viewing the world in terms of gender schemas? According to, Sandra Bem (1987), one way is to encourage children to be **androgynous**, a state in which gender roles encompass characteristics thought typical of both sexes. For instance, parents and caregivers can encourage preschool children to see males as assertive (typically viewed as a male-appropriate trait) but at the same time warm and tender (usually viewed as female-appropriate traits). Similarly, girls might be encouraged to see the female role as both empathetic and tender (typically seen as female-appropriate traits) and competitive, assertive, and independent (typical male-appropriate traits).

androgynous
a state in which gender roles encompass characteristics thought typical of both sexes

Like the other approaches to gender development (summarized in Table 8-1), the cognitive perspective does not imply that differences between the two sexes are in any way improper or inappropriate. Instead, it suggests that preschoolers should be taught to treat others as individuals. Furthermore, preschoolers need to learn the importance of fulfilling their own talents, acting as individuals and not as representatives of a particular gender.

Table 8-1 Four Approaches to Gender Development

Perspective	Key Concepts	Applying the Concepts to Preschool Children
Biological	Our ancestors who behaved in ways that are now stereotypically feminine or masculine may have been more successful in reproducing. Brain differences may lead to gender differences.	Girls may be genetically "programmed" by evolution to be more expressive and nurturing, while boys are "programmed" to be more competitive and forceful. Abnormal hormone exposure before birth has been linked to both boys and girls behaving in ways typically expected of the other gender.
Psychoanalytic	Gender development is the result of identification with the same-sex parent, achieved by moving through a series of stages related to biological urges.	Girls and boys whose parents of the same sex behave in stereotypically masculine or feminine ways are likely to do so, too, perhaps because they identify with those parents.
Social Learning	Children learn gender-related behavior and expectations from their observation of others' behavior.	Children notice that other children and adults are rewarded for behaving in ways that conform to standard gender stereotypes—and sometimes punished for violating those stereotypes.
Cognitive	Through the use of gender schemas, developed early in life, preschoolers form a lens through which they view the world. They use their increasing cognitive abilities to develop "rules" about what is appropriate for males and females.	Preschoolers are more rigid in their rules about proper gender behavior than people at other ages, perhaps because they have just developed gender schemas that don't yet permit much variation from stereotypical expectations.

Module 8.1 Review

- According to Erikson's psychosocial development theory, preschool-age children move from the autonomy-versus-shame-and-doubt stage to the initiative-versus-guilt stage.
- During the preschool years, children develop their self-concepts, beliefs about themselves that they derive from their own perceptions, their parents' behaviors, and society.
- Racial and ethnic awareness begins to form in the preschool years. Gender awareness also develops in the preschool years. Explanations of this phenomenon include biological, psychoanalytical, learning, and cognitive approaches.

Journal Writing Prompt

Applying Lifespan Development: If you were writing a book or a television show for children, what characters or stories could you write to encourage less stereotypical gender schemas?

Friends and Family: Preschoolers' Social Lives

When Juan was three, he had his first best friend, Emilio. Juan and Emilio, who lived in the same apartment building in San Jose, were inseparable. They played incessantly with toy cars, racing them up and down the apartment hallways until some of the neighbors began to complain about the noise. They pretended to read to one another, and sometimes they slept over at each other's home—a big step for a three-year-old. Neither boy seemed more joyful than when he was with his "best friend"—the term each used of the other.

An infant's family can provide nearly all the social contact he or she needs. As preschoolers, however, many children, like Juan and Emilio, begin to discover the joys of friendship with their peers. Although they may expand their social circles considerably, parents and family nevertheless remain very influential in the lives of preschoolers. Let's take a look at both of these sides of preschoolers' social development, friends and family.

The Development of Friendships

LO 8.4 Describe the sorts of social relationships that preschool-age children engage in.

Before the age of three, most social activity involves simply being in the same place at the same time, without real social interaction. However, at around the age of three, children begin to develop real friendships like Juan and Emilio's as peers come to be seen as

As preschoolers get older, their conception of friendship evolves and the quality of their interactions changes.

individuals who hold some special qualities and rewards. While preschoolers' relations with adults reflect children's needs for care, protection, and direction, their relations with peers are based more on the desire for companionship, play, and fun.

As preschoolers age, their ideas about friendship gradually evolve. They come to view friendship as a continuing state, a stable relationship that not only takes place in the immediate moment but also offers the promise of future activity (Hay, Payne, & Chadwick, 2004; Sebanc et al., 2007; Proulx & Poulin, 2013; Paulus & Moore, 2014).

The quality and kinds of interactions children have with friends change during the preschool period. For three-year-olds, the focus of friendship is the enjoyment of carrying out shared activities—doing things together and playing jointly, as when Juan and Emilio played with their toy cars in the hallway. Older preschoolers, however, pay more attention to abstract concepts, such as trust, support, and shared interests (Park, Lay, & Ramsay, 1993). Throughout the preschool years, playing together remains an important part of all friendships. Like friendships, these play patterns change during the preschool years.

Playing by the Rules: The Work of Play

LO 8.5 **Explain how and why preschool-age children play.**

> *In Rosie Graiff's class of three-year-olds, Minnie bounces her doll's feet on the table as she sings softly to herself. Ben pushes his toy car across the floor, making motor noises. Sarah chases Abdul around and around the perimeter of the room.*

Play is more than what children of preschool age do to pass the time. Instead, play helps preschoolers develop socially, cognitively, and physically. It even performs an important role in brain growth and development (Whitebread et al., 2009; McGinnis, 2012; Holmes & Romeo, 2013).

functional play
play that involves simple, repetitive activities typical of three-year-olds

constructive play
play in which children manipulate objects to produce or build something

parallel play
action in which children play with similar toys, in a similar manner, but do not interact with each other

CATEGORIZING PLAY. At the beginning of the preschool years, children engage in **functional play**—simple, repetitive activities typical of three-year-olds. Functional play may involve objects, such as dolls or cars, or repetitive muscular movements, such as skipping, jumping, or rolling and unrolling a piece of clay. Functional play, then, involves doing something for the sake of being active rather than with the aim of creating some end product (Bober, Humphry, & Carswell, 2001; Kantrowitz & Evans, 2004).

As children get older, functional play declines. By the time they are four, children become involved in a more sophisticated form of play. In **constructive play** children manipulate objects to produce or build something. A child who builds a house out of Legos or puts a puzzle together is involved in constructive play: He or she has an ultimate goal—to produce something. Such play is not necessarily aimed at creating something novel, since children may repeatedly build a house of blocks, let it fall into disarray, and then rebuild it.

Constructive play gives children a chance to test their developing physical and cognitive skills and to practice their fine muscle movements. They gain experience in solving problems about the ways and the sequences in which things fit together. They also learn to cooperate with others—a development we observe as the social nature of play shifts during the preschool period. Consequently, it's important for adults who care for preschoolers to provide a variety of toys that allow for both functional and constructive play (Shi, 2003; Love & Burns, 2006; Oostermeijer, Boonen, & Jolles, 2014).

In parallel play, children play with similar toys, in a similar manner, but don't necessarily interact with one another.

THE SOCIAL ASPECTS OF PLAY. If two preschoolers are sitting at a table side by side, each putting a different puzzle together, are they engaged jointly in play?

According to pioneering work done by Mildred Parten (1932), the answer is "yes." She suggests that these preschoolers are engaged in **parallel play**, in which children play with similar toys, in a similar manner, but do not interact with each other. Parallel play is typical for children during the early preschool years. Preschoolers also

engage in another form of play, a highly passive one: onlooker play. In **onlooker play**, children simply watch others at play but do not actually participate themselves. They may look on silently, or they may make comments of encouragement or advice.

As they get older, however, preschool-age children engage in more sophisticated forms of social play that involve a greater degree of interaction. In **associative play**, two or more children actually interact with one another by sharing or borrowing toys or materials, although they do not do the same thing. In **cooperative play**, children genuinely play with one another, taking turns, playing games, or devising contests.

Usually associative and cooperative play do not typically become common until children reach the end of the preschool years. But children who have had substantial preschool experience are more apt to engage in more social forms of behavior, such as associative and cooperative play, earlier in the preschool years than those with less experience (Brownell, Ramani, & Zerwas, 2006; Dyer & Moneta, 2006). (The various types of play are summarized in Table 8-2.)

Solitary and onlooker play continue in the later stages of the preschool period. There are simply times when children prefer to play by themselves. And when newcomers join a group, one strategy for becoming part of the group—often successful—is to engage in onlooker play, waiting for an opportunity to join the play more actively (Lindsey & Colwell, 2003).

The nature of pretend, or make-believe, play also changes during the preschool period. In some ways, pretend play becomes increasingly *un*realistic—and even more imaginative—as preschoolers change from using only realistic objects to using less concrete ones. Thus, at the start of the preschool period, children may pretend to listen to a radio only if they actually have a plastic radio that looks realistic. Later, however, they are more likely to use an entirely different object, such as a cardboard box, as a pretend radio (Parsons & Howe, 2013; Russ, 2014).

Russian developmentalist Lev Vygotsky, whom we discussed in Chapter 7, argued that pretend play, particularly if it involves social play, is an important means for expanding preschool-age children's cognitive skills. Through make-believe

onlooker play
action in which children simply watch others at play, but do not actually participate themselves

associative play
play in which two or more children actually interact with one another by sharing or borrowing toys or materials, although they do not do the same thing

cooperative play
play in which children genuinely interact with one another, taking turns, playing games, or devising contests

WATCH THIS VIDEO ON MYPSYCHLAB PLAY STYLES

Table 8-2 Preschoolers' Play

Type of Play	Description	Examples
General Categories		
Functional play	Simple, repetitive activities typical of three-year-olds. May involve objects or repetitive muscular movements.	Moving dolls or cars repetitively. Skipping, jumping, rolling or unrolling a piece of clay.
Constructive play	More sophisticated play in which children manipulate objects to produce or build something. Developed by age four, constructive play lets children test physical and cognitive skills and practice fine muscle movements.	Building a dollhouse or car garage out of Legos, putting together a puzzle, making an animal out of clay.
Social Aspects of Play (Parten's Categories)		
Parallel play	Children use similar toys in a similar manner at the same time, but do not interact with each other. Typical of children during the early preschool years.	Children sitting side by side, each playing with his or her own toy car, putting together his or her own puzzle, or making an individual clay animal.
Onlooker play	Children simply watch others at play, but do not actually participate. They may look on silently or they may make comments of encouragement or advice. Common among preschoolers and can be helpful when a child wishes to join a group already at play.	One child watches as a group of others plays with dolls, cars, or clay; builds with Legos, or works on a puzzle together.
Associative play	Two or more children interact, sharing or borrowing toys or materials, although they do not do the same thing.	Two children, each building his or her own Lego garage, may trade bricks back and forth.
Cooperative play	Children genuinely play with one another, taking turns, playing games, or devising contests.	A group of children working on a puzzle may take turns fitting in the pieces. Children playing with dolls or cars may take turns making the dolls talk or may agree on rules to race the cars.

According to developmentalist Lev Vygotsky, children are able, through make-believe play, to practice activities that are part of their particular culture and broaden their understanding of the way the world functions.

play, children are able to "practice" activities (such as pretending to use a computer) that are a part of their particular culture and broaden their understanding of the way the world functions.

Furthermore, play helps the brain develop. Based on experiments with non-humans, neuroscientist Sergio Pellis has found that depriving animals of the ability to play affects the course of brain development (Pellis & Pellis, 2007; Bell, Pellis, & Kolb, 2010).

In one experiment, Pellis and his colleagues observed rats under two different conditions. In the control condition, a juvenile target rat was housed with three other young females, allowing them to engage in the equivalent of rat play. In the experimental condition, the young target rat was housed with three adult females, depriving the young rat of the opportunity to play. When Pellis examined the brains of the rats, he found that the play-deprived rats showed deficiencies in the development of their prefrontal cortex (Pellis & Pellis, 2007; Henig, 2008; Bell, Pellis, & Kolb, 2009). Although it's a big leap from rat play to toddler play, the results of the study suggest the significance of play in promoting cognitive development. Ultimately, play may be one of the engines that fuels the intellectual development of preschoolers.

Culture also affects children's styles of play. For example, Korean American children engage in a higher proportion of parallel play than their Anglo-American counterparts, while Anglo-American preschoolers are involved in more pretend play (see Figure 8-1; Farver, Kim, & Lee-Shin, 1995; Farver & Lee-Shin, 2000; Bai, 2005).

Preschoolers' Theory of Mind: Understanding What Others Are Thinking

LO 8.6 Summarize how thinking changes in the preschool years.

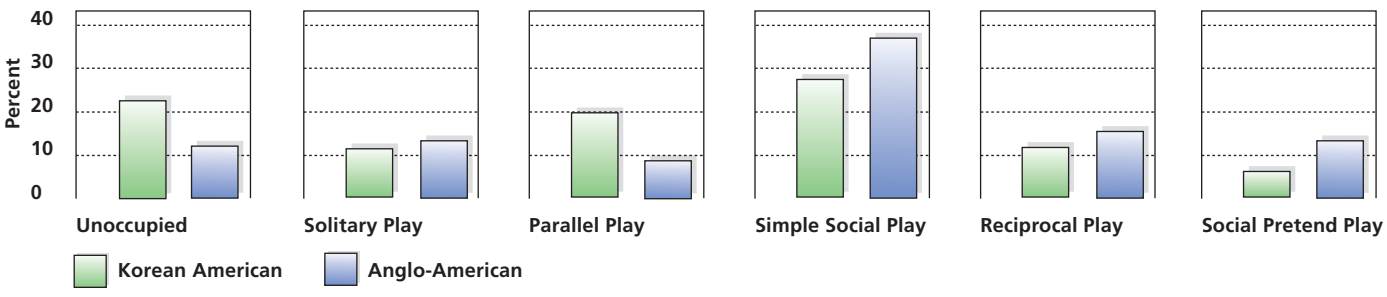
One reason behind the changes in children's play is the continuing development of preschoolers' theory of mind. As we first discussed in Chapter 6, *theory of mind* refers to knowledge and beliefs about how the mind operates. Using their theory of mind, preschool children are able to come up with explanations for how *others* think and reasons for why they behave the way they do.

One of the main reasons for children's emerging play and social skills is that during the preschool years, children increasingly can see the world from others' perspectives. Even children as young as two are able to understand that others have emotions. By the age of three or four, preschoolers can distinguish between something in their minds and physical actuality. For instance, three-year-olds know that they can imagine something that is not physically present, such as a zebra, and that others can do the same. They can also pretend that something has happened and react as if it really had occurred, a skill

Figure 8-1 Comparing Play Complexity

An examination of Korean American and Anglo-American preschoolers' play complexity finds clear differences in patterns of play. Can you think of any explanation for this finding?

(**Source:** Based on Farver, Kim, & Lee-Shin, 1995.)



that becomes part of their imaginative play. And they know that others have the same capability (Andrews, Halford, & Bunch, 2003; Wellman, 2012; Wu & Su, 2014).

Preschool-age children also become more insightful regarding the motives and reasons behind people's behavior. They begin to understand that their mother is angry because she was late for an appointment, even if they themselves haven't seen her be late. Furthermore, by the age of four, preschool-age children's understanding that people can be fooled and mistaken by physical reality (such as magic tricks involving sleight-of-hand) becomes surprisingly sophisticated. This increase in understanding helps children become more socially skilled as they gain insight into what others are thinking (Fitzgerald & White, 2002; Eisbach, 2004; Fernández, 2013).

There are limits, however, to three-year-olds' theory of mind. Although they understand the concept of "pretend" by the age of three, their understanding of "belief" is still not complete. The difficulty experienced by three-year-olds in comprehending "belief" is illustrated by their performance on the *false belief* task. In the false belief task, preschoolers are shown a doll named Maxi who places chocolate in a cabinet and then leaves. After Maxi is gone, though, his mother moves the chocolate somewhere else.

After viewing these events, a preschooler is asked where Maxi will look for the chocolate when he returns. Three-year-olds answer (erroneously) that Maxi will look for it in the new location. In contrast, four-year-olds correctly realize that Maxi has the erroneous false belief that the chocolate is still in the cabinet, and that's where he will look for it (Amsterlaw & Wellman, 2006; Brown & Bull, 2007; Lecce et al., 2014).

By the end of the preschool years, most children easily solve false belief problems. Certain children have considerable difficulties with false belief problems throughout their lifetimes: children with autism spectrum disorder. *Autism spectrum disorder* is the psychological disorder that produces significant language and emotional difficulties.

Children with autism spectrum disorder find it particularly difficult to relate to others, in part because they find it difficult to understand what others are thinking. According to the Centers for Disease Control, about 1 in 68 children (primarily males) have autism spectrum disorder, which is characterized by a lack of connection to other people, even parents, and an avoidance of interpersonal situations. Individuals with autism spectrum disorder are bewildered by false belief problems no matter how old they are (Begeer et al., 2012; Carey, 2012; Miller, 2012; Peterson, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB THEORY OF MIND

THE EMERGENCE OF THEORY OF MIND. What factors are involved in the emergence of theory of mind? Certainly, brain maturation is an important factor. As myelination within the frontal lobes becomes more pronounced, preschoolers develop more emotional capacity involving self-awareness. In addition, hormonal changes seem to be related to emotions that are more evaluative in nature (Davidson, 2003; Schore, 2003; Sabbagh et al., 2009).

Developing language skills are also related to the increasing sophistication of children's theory of mind. In particular, the ability to understand the meaning of words such as *think* and *know* is important in helping preschool-age children understand the mental lives of others (Astington & Baird, 2005; Farrant, Fletcher, & Maybery, 2006; Farrar et al., 2009).

As much as the child's developing theory of mind promotes more engaged social interactions and play, the process is reciprocal: Opportunities for social interaction and make-believe play are also critical in promoting the development of theory of mind. For example, preschool-age children with older siblings (who provide high levels of social interaction) have more sophisticated theories of mind than those without older siblings. In addition, abused children show delays in their ability to correctly answer the false belief task, in part due to reduced experience with normal social interaction (Nelson, Adamson, & Bakeman, 2008; Müller et al., 2012; O'Reilly & Peterson, 2015).

From Research to Practice

How Children Learn to Become Better Liars

Preschool children learn that it's better to admit the truth than to lie about their misbehavior at around the age of three. But knowing that lying is wrong and refraining from lying are different things. Young children do lie, but to lie successfully, they must do two things: They must understand the social norms that make lying more or less acceptable, and they must have established some theory of mind (Feldman, 2010; Lee, 2013).

Understanding social norms is important because some social circumstances permit lying, and even expect it. Politeness, for example, dictates expressing gratitude for a gift, even if you don't like it; at other times white lies protect others from embarrassment or unnecessary hurt feelings. In one study, children between the ages of three and seven were asked to take a photograph of a model who had a large and distinctly visible mark on his or her nose. Before the photograph was taken, the model asked the child if he or she looked okay. Most of the children said that yes he or she did, but later confirmed to the experimenter that they didn't actually think the model looked okay.

In another study, children in the same age group received a gift from the experimenter, which turned out to be an undesirable bar of soap. Many said that they liked it, even though their facial expressions upon opening it said otherwise (Talwar & Lee, 2002a; Talwar, Murphy, & Lee, 2007).

When the children who said they liked the soap were immediately asked by the experimenter why they liked it, the older children told even more elaborate lies, such as that they ran out of soap at home or that they actually collect soap bars. It's this behavior that requires a theory of mind, which enables effective deception by maintaining a plausible charade. In another study, children are told not to peek at a hidden toy while the experimenter leaves the room. But most of the children did peek, and they lied about peeking. When asked what they thought it might be, most two- and three-year-olds blurted out the identity of the toy, unwittingly revealing their lie. But older children knew to feign complete unawareness—once they advanced one false premise (not having peeked at the toy), they knew they had to construct other false premises (that they were clueless about the toy's identity) to maintain congruence from the listener's perspective.

Verbal deception, then, entails both knowing when to lie and remembering to keep subsequent words and behaviors consistent with the lie—skills that develop quickly during the preschool years (Talwar & Lee, 2002b, 2008; Lee, 2013).

Shared Writing Prompt

Why do you think children learn at a young age to lie to protect others' feelings?

Cultural factors also play an important role in the development of theory of mind and the interpretations that children bring to bear on others' actions. For example, children in more industrialized Western cultures may be more likely to see others' behavior as due to the kind of people they are, a function of the people's personal traits and characteristics ("She won the race because she is really fast"). In contrast, children in non-Western cultures may see others' behavior as produced by forces that are less under their personal control ("She won the race because she was lucky") (Tardif, Wellman, & Cheung, 2004; Wellman et al., 2006; Liu et al., 2008). (Also see the From Research to Practice box.)

Preschoolers' Family Lives

LO 8.7 Describe ways in which family relationships affect the development of preschool-age children.

> *Four-year-old Benjamin was watching TV while his mom cleaned up after dinner. After a while, he wandered in and grabbed a towel, saying, "Mommy, let me help you do the dishes." Surprised by this unprecedented behavior, she asked him, "Where did you learn to do dishes?" "I saw it on* Leave It to Beaver*," he replied, "Only it was the dad helping. Since we don't have a dad, I figured I'd do it."*

For an increasing number of preschool-age children, life does not mirror what we see in reruns of old sitcoms. Many face the realities of an increasingly complicated world. For instance, children are increasingly likely to live with only one parent. In 1960, less than 10 percent of all children under the age of 18 lived with one parent. Three decades later, a single parent heads a quarter of all families. There are also large racial disparities: nearly half of all African American children and a quarter of Hispanic children live with a single parent, compared with 22 percent of White children (Grall, 2009).

Still, for most children the preschool years are not a time of upheaval and turmoil. Instead, the period encompasses a growing interaction with the world at large. As we've

seen, for instance, preschoolers begin to develop genuine friendships with other children, in which close ties emerge. One central factor leading preschoolers to develop friendships comes when parents provide a warm, supportive home environment. Strong, positive relationships between parents and children encourage children's relationships with others. How do parents nurture that relationship?

Effective Parenting: Teaching Desired Behavior

LO 8.8 Describe the kinds of disciplinary styles parents employ with preschool-age children and what effects they have.

While she thinks no one is looking, Maria goes into her brother Alejandro's bedroom, where he has been saving the last of his Halloween candy. Just as she takes his last Reese's Peanut Butter Cup, the children's mother walks into the room and immediately takes in the situation.

If you were Maria's mother, which of the following reactions seems most reasonable?

1. Tell Maria that she must go to her room and stay there for the rest of the day and that she is going to lose access to her favorite blanket, the one she sleeps with every night and during naps.
2. Mildly tell Maria that what she did was not such a good idea and she shouldn't do it in the future.
3. Explain why her brother Alejandro would be upset by her actions and tell her that she must go to her room for an hour as punishment.
4. Forget about it and let the children sort it out themselves.

Each of these four alternative responses represents one of the major parenting styles identified by Diana Baumrind and updated by Eleanor Maccoby and colleagues (Maccoby & Martin, 1983; Baumrind, 1980, 2005).

Authoritarian parents respond as in the first alternative. They are controlling, punitive, rigid, and cold. Their word is law, and they value strict, unquestioning obedience from their children. They also do not tolerate expressions of disagreement.

Permissive parents, in contrast, provide lax and inconsistent feedback, as in the second alternative. They require little of their children, and they don't see themselves as holding much responsibility for how their children turn out. They place little or no limits or control on their children's behavior.

Authoritative parents are firm, setting clear and consistent limits. Although they tend to be relatively strict, like authoritarian parents, they are loving and emotionally supportive. They also try to reason with their children, giving explanations for why they should behave in a particular way ("Alejandro is going to be upset"), and communicating the rationale for any punishment they may impose. Authoritative parents encourage their children to be independent.

Finally, **uninvolved parents** show virtually no interest in their children, displaying indifferent, rejecting behavior. They are detached emotionally and see their role as no more than feeding, clothing, and providing shelter for their child. In its most extreme form, uninvolved parenting results in *neglect*, a form of child abuse. (The four patterns are summarized in Table 8-3.)

Does the particular style of discipline that parents use result in differences in children's behavior? The answer is very much yes (Hoeve et al., 2008; Cheah et al., 2009; Lin, Chiu, & Yeh, 2012):

- Children of authoritarian parents tend to be withdrawn, showing relatively little sociability. They are not very friendly, often behaving uneasily around their peers. Girls who are raised by authoritarian parents are especially dependent on their parents, whereas boys are unusually hostile.
- Permissive parents have children who, in many ways, share the undesirable characteristics of children of authoritarian parents. Children with permissive parents tend to be dependent and moody, and they are low in social skills and self-control.

authoritarian parents
parents who are controlling, punitive, rigid, and cold, and whose word is law

permissive parents
parents who provide lax and inconsistent feedback and require little of their children

authoritative parents
parents who are firm, setting clear and consistent limits, but who try to reason with their children, giving explanations for why they should behave in a particular way

uninvolved parents
parents who show almost no interest in their children and indifferent, rejecting behavior

Table 8-3 Parenting Styles

How Demanding Parents Are of Children ▶ / How Responsive Parents Are to a Child ▼	Demanding	Undemanding
	Authoritative	**Permissive**
Highly Responsive	**Characteristics:** firm, setting clear and consistent limits **Relationship with Children:** Although they tend to be relatively strict, they are loving and supportive and encourage independence. They try to reason with their children, giving explanations for why they should behave in a particular way, and communicate the rationale for punishments they impose.	**Characteristics:** lax and inconsistent feedback **Relationship with Children:** They require little of their children, and they don't see themselves as holding much responsibility for how their children turn out. They place little or no limits or control on their children's behavior.
	Authoritarian	**Uninvolved**
Low Responsive	**Characteristics:** controlling, punitive, rigid, cold **Relationship with Children:** Their word is law, and they value strict, unquestioning obedience from their children. They also do not tolerate expressions of disagreement.	**Characteristics:** displaying indifferent, rejecting behavior **Relationship with Children:** They are detached emotionally and see their role as only providing food, clothing, and shelter. In its extreme form, this parenting style results in neglect, a form of child abuse.

- Children of authoritative parents fare best. They generally are independent, friendly with their peers, self-assertive, and cooperative. They have strong motivation to achieve, and they are typically successful and likable. They regulate their own behavior effectively, both in terms of their relationships with others and emotional self-regulation. Some authoritative parents also display several characteristics that have come to be called *supportive parenting*, including parental warmth, proactive teaching, calm discussion during disciplinary episodes, and interest and involvement in children's activities. Children whose parents engage in such supportive parenting show better adjustment and are better protected from the consequences of later adversity they may encounter (Pettit, Bates, & Dodge, 1997; Belluck, 2000; Kaufmann et al., 2000).
- Children whose parents show uninvolved parenting styles are the worst off. Their parents' lack of involvement disrupts their emotional development considerably, leading them to feel unloved and emotionally detached, and their physical and cognitive development is adversely affected as well.

Although such classification systems are useful ways of categorizing and describing parents' behavior, they are not a recipe for success. Parenting and growing up are more complicated than that! For instance, in a significant number of cases the children of authoritarian and permissive parents develop quite successfully. Furthermore, most parents are not entirely consistent: Although the authoritarian, permissive, authoritative, and uninvolved patterns describe general styles, sometimes parents switch from their dominant mode to one of the others. For instance, when a child darts into the street, even the most laid-back and permissive parent is likely to react in a harsh, authoritarian manner, laying down strict demands about safety. In such cases, authoritarian styles may be most effective (Eisenberg & Valiente, 2002; Gershoff, 2002).

Children with authoritarian parents tend to be withdrawn and unsociable. What are the consequences of parents who are too permissive? Too uninvolved?

CULTURAL DIFFERENCES IN CHILDREARING PRACTICES. It's important to keep in mind that the findings regarding childrearing styles we have been discussing are chiefly applicable to Western societies. The style of parenting that is most successful may depend

quite heavily on the norms of a particular culture—and what parents in a particular culture are taught regarding appropriate childrearing practices (Keller et al., 2008; Yagmurlu & Sanson, 2009; Calzada et al., 2012).

For example, the Chinese concept of *chiao shun* suggests that parents should be strict, firm, and in tight control of their children's behavior. Parents are seen to have a duty to train their children to adhere to socially and culturally desirable standards of behavior, particularly those manifested in good school performance. Children's acceptance of such an approach to discipline is seen as a sign of parental respect (Chao, 1994; Lui & Rollock, 2013; Frewen et al., 2015).

Typically, parents in China are highly directive with their children, pushing them to excel and controlling their behavior to a considerably higher degree than parents do in Western countries. And it works: Children of Asian parents tend to be quite successful, particularly academically (Steinberg, Dornbusch, & Brown, 1992; Nelson et al., 2006).

The style of parenting that is most effective depends on what parents in a particular culture are taught regarding appropriate childrearing practices.

In contrast, U.S. parents are generally advised to use authoritative methods and explicitly to avoid authoritarian measures. It is interesting to note that it wasn't always this way. Until World War II, the point of view that dominated the advice literature was authoritarian, apparently founded on Puritan religious influences that suggested that children had "original sin" or that they needed to have their wills broken (Smuts & Hagen, 1985).

In short, the childrearing practices that parents are urged to follow reflect cultural perspectives about the nature of children as well as about the appropriate role of parents and their support system. No single parenting pattern or style, then, is likely to be universally appropriate or invariably to produce successful children (Chang, Pettit, & Katsurada, 2006; Wang, Pomerantz et al., 2007; Pomerantz & Wang, 2011).

Similarly, it is important to keep in mind that childrearing practices are not the sole influence on children's development. For example, sibling and peer influences play a significant role in children's development. Furthermore, children's behavior is in part produced by their unique genetic endowments, and their behavior can in turn shape parental behavior. In sum, parents' childrearing practices are just one of a rich array of environmental and genetic influences that affect children (Boivin et al., 2005; Loehlin, Neiderhiser, & Reiss, 2005; Rossi, 2014).

Child Abuse and Psychological Maltreatment: The Grim Side of Family Life

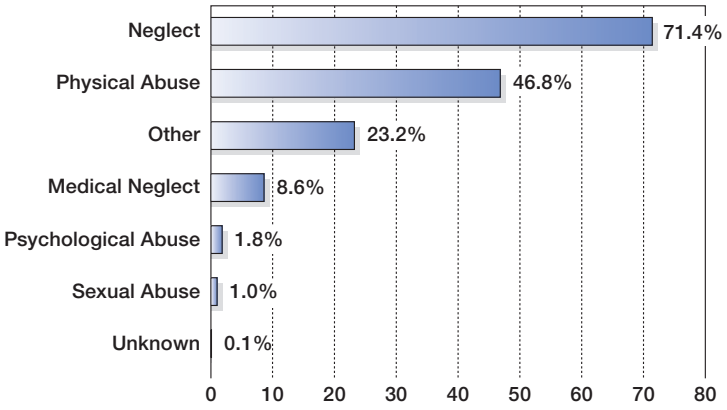
LO 8.9 **List the factors that contribute to child abuse and neglect.**

The figures are gloomy and disheartening: In the United States, at least five children are killed by their parents or caretakers every day, and 140,000 others are physically injured every year. Around 3 million children are abused or neglected in the United States each year. The abuse takes several forms, ranging from actual physical abuse to psychological mistreatment (see Figure 8-2; National Clearinghouse on Child Abuse and Neglect Information, 2004; U.S. Department of Health and Human Services, 2007).

Figure 8-2 Types of Child Abuse

Neglect is the most frequent form of abuse. How can educators and health-care providers help identify cases of child abuse?

(**Source:** Child Welfare Information Gateway. https://www.childwelfare.gov/pubs/factsheets/fatality/, 2015.)



PHYSICAL ABUSE. Child abuse can occur in any household, regardless of economic well-being or the social status of the parents. It is most frequent in families living in stressful environments. Poverty, single parenthood, and higher-than-average levels of marital conflict help create such environments. Stepfathers are more likely to commit abuse against stepchildren than genetic fathers are against their own offspring. Child abuse is also more likely when there is a history of violence between spouses (Osofsky, 2003; Evans, 2004; Ezzo & Young, 2012). Table 8-4 lists some of the warning signs of abuse.

Abused children are more likely to be fussy, resistant to control, and not readily adaptable to new situations. They have more headaches and stomachaches, experience more bed-wetting, are generally more anxious, and may show developmental delays. Children in certain age groups are also more likely to be the targets of abuse: Three- and four-year-olds and 15- to 17-year-olds are somewhat more likely to be abused by their parents than children of other ages (Ammerman & Patz, 1996; Haugaard, 2000; Carmody et al., 2013).

As you consider this information about the characteristics of abused children, keep in mind that labeling children as being at higher risk for receiving abuse does not make them responsible for their abuse; the family members who carry out the abuse are at fault. Statistical findings simply suggest that children with such characteristics are more at risk of being the recipients of family violence.

Reasons for Physical Abuse Why does physical abuse occur? Most parents certainly do not intend to hurt their children. Indeed, most parents who abuse their children later express bewilderment and regret about their own behavior.

One reason for child abuse is the vague demarcation between permissible and impermissible forms of physical violence. Societal folklore in the United States says that spanking is not merely acceptable but often necessary and desirable. Almost half of mothers with children less than four years of age have spanked their child in the previous week, and close to 20 percent of mothers believe it is appropriate to spank a child less than one year of age. In some other cultures, physical discipline is even more common (Lansford et al., 2005; Deb & Adak, 2006; Shor, 2006).

Unfortunately, the line between "spanking" and "beating" is not clear, and spankings begun in anger can escalate into abuse. Increasing scientific evidence suggests that spanking should be avoided entirely. Although physical punishment may produce immediate compliance—children typically stop the behavior spanking is meant to end—there are a number of serious long-term side effects. For example, spanking is associated with lower quality of parent–child relationships, poorer mental health for both child and parent, higher levels of delinquency, and more antisocial behavior. Spanking also teaches children that violence is an acceptable solution to problems by serving as a model of violent, aggressive behavior. Consequently, according to the American Academy of Pediatrics, the use of physical punishment of any sort is *not* recommended (Benjet & Kazdin, 2003; Zolotor et al., 2008; Gershoff et al., 2012).

Table 8-4 What Are the Warning Signs of Child Abuse?

Because child abuse is typically a secret crime, identifying the victims of abuse is particularly difficult. Still, there are several signs in a child that indicate that he or she is the victim of violence (Robbins, 1990):

- Visible, serious injuries that have no reasonable explanation
- Bite or choke marks
- Burns from cigarettes or immersion in hot water
- Feelings of pain for no apparent reason
- Fear of adults or care providers
- Inappropriate attire in warm weather (long sleeves, long pants, high-necked garments)—possibly to conceal injuries to the neck, arms, and legs
- Extreme behavior—highly aggressive, extremely passive, extremely withdrawn
- Fear of physical contact

If you suspect a child is a victim of aggression, it is your responsibility to act. Call your local police or the department of social services in your city or state, or call Child Help U.S.A. at 1-800-422-4453. Talk to a teacher or a member of the clergy. Remember, by acting decisively you can literally save someone's life.

Another factor that leads to high rates of abuse is the privacy in which child care is conducted in Western societies. In many other cultures, childrearing is seen as the joint responsibility of several people and even society as a whole. In most Western cultures—and particularly the United States—children are raised in private, isolated households. Because child care is seen as the sole responsibility of the parent, other people are typically not available to help out when a parent's patience is tested (Chaffin, 2006; Elliott & Urquiza, 2006).

Sometimes abuse is the result of an adult's unrealistically high expectations regarding children's abilities to be quiet and compliant at a particular age. Children's failure to meet these unrealistic expectations may provoke abuse (Peterson, 1994).

Increasingly, spanking and other forms of physical violence are being seen as a human rights violation. The United Nations Committee on the Rights of the Child has called physical punishment "legalized violence against children," and it has called for its elimination. A treaty supporting this view has been ratified by 192 countries, with the exception of the United States and Somalia (Smith, 2012).

The Cycle of Violence Hypothesis Many times, those who abuse children were themselves abused as children. According to the **cycle of violence hypothesis**, the abuse and neglect that children suffer predispose them as adults to abuse and neglect their own children (Widom, 2000; Heyman & Slep, 2002).

cycle of violence hypothesis
the theory that the abuse and neglect that children suffer predispose them as adults to abuse and neglect their own children

According to this hypothesis, victims of abuse have learned from their childhood experiences that violence is an appropriate and acceptable form of discipline. Violence may be perpetuated from one generation to another, as each generation learns to behave abusively (and fails to learn the skills needed to solve problems and instill discipline without resorting to physical violence) through its participation in an abusive, violent family (Blumenthal, 2000; Ethier, Couture, & Lacharite, 2004; Ehrensaft et al., 2015).

Being abused as a child does not inevitably lead to abuse of one's own children. Statistics show that only about one-third of people who were abused or neglected as children abuse their own children; the remaining two-thirds of people abused as children do not turn out to be child abusers. Clearly, suffering abuse as a child is not the full explanation for child abuse in adults (Cicchetti, 1996; Straus & McCord, 1998).

PSYCHOLOGICAL MALTREATMENT. Children may also be the victims of more subtle forms of mistreatment. **Psychological maltreatment** occurs when parents or other caregivers harm children's behavioral, cognitive, emotional, or physical functioning. It may be the result of either overt behavior or neglect (Higgins & McCabe, 2003; Garbarino, 2013).

psychological maltreatment
abuse that occurs when parents or other caregivers harm children's behavioral, cognitive, emotional, or physical functioning

For example, abusive parents may frighten, belittle, or humiliate their children, thereby intimidating and harassing them. Children may be made to feel like disappointments or failures, or they may be constantly reminded that they are a burden to their parents. Parents may tell their children that they wish they had never had children and specifically that they wish that their children had never been born. Children may be threatened with abandonment or even death. In other instances, older children may be exploited. They may be forced to seek employment and then to give their earnings to their parents.

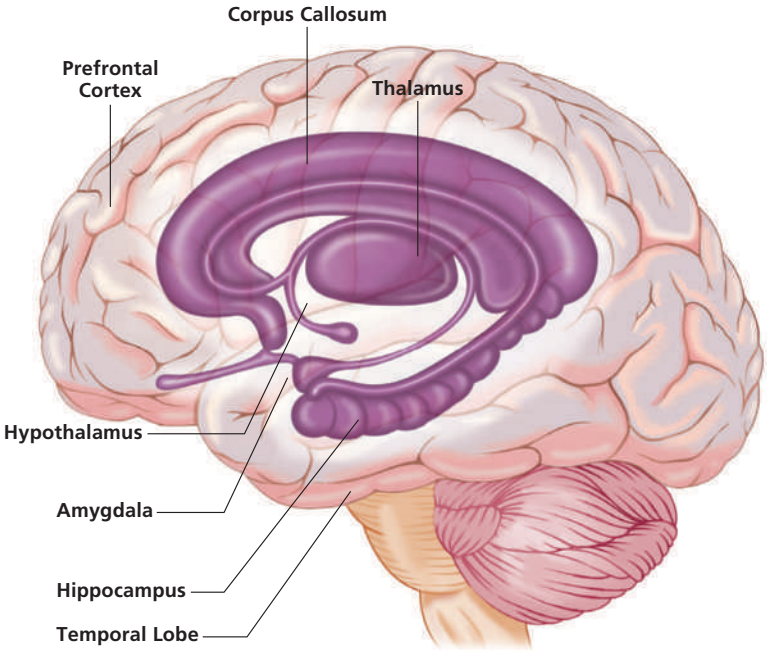
In other cases of psychological maltreatment, the abuse takes the form of neglect. Parents may ignore their children or act emotionally unresponsive to them. In such cases, children may be given unrealistic responsibilities or may be left to fend for themselves.

No one is certain how much psychological maltreatment occurs each year because figures separating psychological maltreatment from other types of abuse are not routinely gathered. Most maltreatment occurs in the privacy of people's homes. Furthermore, psychological maltreatment typically causes no physical damage, such as bruises or broken bones, to alert physicians, teachers, and other authorities. Consequently, many cases of psychological maltreatment probably are not identified. However, it is clear that profound neglect that involves children who are unsupervised or uncared for is the most

Two of the children in this large family allegedly were singled out for abuse by their parents and were severely malnourished, while other children were seemingly well-cared for. What might account for this unusual situation?

Figure 8-3 Abuse Alters the Brain

The limbic system, comprised of the hippocampus and amygdala, can be permanently altered as a result of childhood abuse.



frequent form of psychological maltreatment (Hewitt, 1997; Scott et al., 2012).

What are the consequences of psychological maltreatment? Some children are sufficiently resilient to survive the abuse and grow into psychologically healthy adults. In many cases, however, lasting damage results. For example, psychological maltreatment has been associated with low self-esteem, lying, misbehavior, and underachievement in school. In extreme cases, it can produce criminal behavior, aggression, and murder. In other instances, children who have been psychologically maltreated become depressed and even commit suicide (Allen, 2008; Palusci & Ondersma, 2012; Spinazzola et al., 2014).

One reason that psychological maltreatment—as well as physical abuse—produces so many negative consequences is that the brains of victims undergo permanent changes due to the abuse (see Figure 8-3). For example, childhood maltreatment can lead to reductions in the size of the amygdala and hippocampus in adulthood. The stress, fear, and terror produced by abuse may also produce permanent changes in the brain due to overstimulation of the limbic system. Because the limbic system is involved in the regulation of memory and emotion, the result can be antisocial behavior during adulthood (Watts-English et al., 2006; Rick & Douglas, 2007; Twardosz & Lutzker, 2009).

Resilience: Overcoming the Odds

LO 8.10 Define resilience, and describe how it can help abused children.

Given the seriousness of child abuse in all its forms, and the physical, psychological, and neurological damage it can cause, it's remarkable that not all children who have been abused are permanently scarred by it. Actually, some do surprisingly well, considering the type of problems they have encountered. What enables some children to overcome the stress and trauma that in most cases haunts others for life?

resilience
the ability to overcome circumstances that place a child at high risk for psychological or physical damage

The answer appears to be a quality that psychologists have termed resilience. **Resilience** is the ability to overcome circumstances that place a child at high risk for psychological or physical damage, such as extremes of poverty, prenatal stress, or homes that are racked with violence or other forms of social disorder. Several factors seem to reduce and, in certain cases, eliminate some children's reactions to difficult circumstances that produce profoundly negative consequences in others (Trickett, Kurtz, & Pizzigati, 2004; Collishaw et al., 2007; Monahan, Beeber, & Harden, 2012).

According to developmental psychologist Emmy Werner, resilient children tend to have temperaments that evoke positive responses from a wide variety of caregivers. They tend to be affectionate, easygoing, and good-natured. They are easily soothed as infants, and they are able to elicit care from the most nurturant people in any environment in which they find themselves. In a sense, then, resilient children are successful in making their own environments by drawing out behavior in others that is necessary for their own development (Werner & Smith, 2002; Martinez-Torteya et al., 2009; Newland, 2014).

Similar traits are associated with resilience in older children. The most resilient school-age children are those who are socially pleasant, outgoing, and have good communication skills. They tend to be relatively intelligent, and they are independent, feeling that they can shape their own fate and are not dependent on others or luck (Curtis & Cicchetti, 2003; Kim & Cicchetti, 2003; Haskett et al., 2006).

The characteristics of resilient children suggest ways to improve the prospects of children who are at risk from a variety of developmental threats. For instance, in addition to decreasing their exposure to factors that put them at risk in the first place, we need to increase their competence by teaching them ways to deal with their situation. Programs that have been successful in helping especially vulnerable children have a common thread: They provide competent and caring adult models who can teach the children problem-solving skills and help them to communicate their needs to those who are in a position to help them (Davey et al., 2003; Maton, Schellenbach, & Leadbeater, 2004; Condly, 2006; Goldstein & Brooks, 2013).

Are You an Informed Consumer of Development?

Disciplining Children

The question of how best to discipline children has been raised for generations. Answers from developmentalists today include the following advice (O'Leary, 1995; Brazelton & Sparrow, 2003; Flouri, 2005):

- For most children in Western cultures, authoritative parenting works best. Parents should be firm and consistent, providing clear direction for desirable behavior. Authoritative disciplinarians provide rules, but they explain why those rules make sense, using language that children can understand.
- Spanking is *never* an appropriate discipline technique, according to the American Academy of Pediatrics. Not only is spanking less effective than other techniques in curbing undesirable behavior, but it leads to additional, unwanted outcomes, such as the potential for more aggressive behavior. Even though most Americans were spanked as children, the research is totally clear in demonstrating that spanking is inappropriate (Bell & Romano, 2012; American Academy of Pediatrics, 1998, 2012).
- Use *time-out* for punishment, in which children are removed from a situation in which they have misbehaved and are not permitted to engage in enjoyable activities for a set period of time.
- Tailor parental discipline to the characteristics of the child and the situation. Try to keep the child's particular personality in mind, and adapt discipline to it.
- Use routines (such as a bath routine or a bedtime routine) to avoid conflict. For instance, bedtime can be the source of a nightly struggle between a resistant child and an insistent parent. Parental strategies for gaining compliance that involve making the situation predictably enjoyable—such as routinely reading a bedtime story or engaging in a nightly "wrestling" match with the child—can defuse potential battles.

Module 8.2 Review

- In the preschool years, children develop their first true friendships on the basis of personal characteristics, trust, and shared interests.
- The character of preschoolers' play changes over time, growing more sophisticated, interactive, and cooperative, and relying increasingly on social skills.
- During the preschool years, children's theory of mind begins to encompass the thoughts and feelings of others.
- Whatever the changes in the structure of families in recent years, the importance of a warm family environment to children's social development cannot be overstated.
- There are several distinct childrearing styles, including authoritarian, permissive, authoritative, and uninvolved. Childrearing styles show strong cultural influences.
- Some children suffer abuse from their own family members, especially in families living in stressful circumstances. In the United States, a folklore of discipline that views spanking as beneficial, together with an insistence on family privacy, can lead some parents to go over the line and abuse their children.
- Resilience, the ability to overcome highly unfavorable circumstances, is an important temperamental characteristic that can help children overcome abuse and neglect.

Journal Writing Prompt

Applying Lifespan Development: What style of parenting is seen as most appropriate in your culture or country? Have there been any changes? Were your grandparents raised with the same parenting style as you were? What about your parents?

Moral Development and Aggression

> *Lena and Carrie were part of a group of preschoolers who wanted to act out* Goldilocks and the Three Bears. *The teacher began assigning parts. "Carrie, you can be Baby Bear. And Lena, you be Goldilocks." Tears welled up in Carrie's eyes. "I don't want to be Baby Bear," she sobbed. Lena put her arms around Carrie. "You can be Goldilocks, too. We'll be the Goldilocks twins." Carrie cheered up at once, grateful that Lena had understood her feelings and responded with kindness.*

In this short scenario we see many of the key elements of morality, as it is played out among preschool-age children. Changes in children's views of what is ethically right and what is the right way to behave are an important element of growth during the preschool years.

At the same time, the kind of aggression displayed by preschoolers is also changing. We can consider the development of morality and aggression as two sides of the coin of human conduct, and both involve a growing awareness of others.

Developing Morality: Following Society's Rights and Wrongs

LO 8.11 Explain how preschool-age children develop a moral sense.

moral development
the changes in people's sense of justice and of what is right and wrong, and in their behavior related to moral issues

Moral development refers to changes in people's sense of justice and of what is right and wrong, and in their behavior related to moral issues. Developmentalists have considered moral development in terms of children's reasoning about morality, their attitudes toward moral lapses, and their behavior when faced with moral issues. In the process of studying moral development, psychologists have evolved several approaches.

PIAGET'S VIEW OF MORAL DEVELOPMENT. Child psychologist Jean Piaget was one of the first to study questions of moral development. He suggested that moral development, like cognitive development, proceeds in stages (Piaget, 1932). The earliest stage is a broad form of moral thinking he called *heteronomous morality*, in which rules are seen as invariant and unchangeable. During this stage, which lasts from about age four through age seven, children play games rigidly, assuming that there is one, and only one, way to play and that every other way is wrong. At the same time, though, preschool-age children may not even fully grasp game rules. Consequently, a group of children may be playing together, with each child playing according to a slightly different set of rules. Nevertheless, they enjoy playing with others. Piaget suggests that every child may "win" such a game because winning is equated with having a good time, as opposed to truly competing with others.

This rigid heteronomous morality is ultimately replaced by two later stages of morality: incipient cooperation and autonomous cooperation. As its name implies, in the *incipient cooperation stage*, which lasts from around age 7 to age 10, children's games become more clearly social. Children learn the actual formal rules of games, and they play according to this shared knowledge. Consequently, rules are still seen as largely unchangeable. There is a "right" way to play the game, and children in the incipient cooperation stage play according to these formal rules.

It is not until the *autonomous cooperation stage*, which begins at about age 10, that children become fully aware that formal game rules can be modified if the people who play them agree. The later transition into more sophisticated forms of moral development—which we will consider in Chapter 12—also is reflected in school-age children's understanding that rules of law are created by people and are subject to change according to the will of people.

Until these later stages are reached, however, children's reasoning about rules and issues of justice is bounded in the concrete. For instance, consider the following two stories:

Pedro comes home from preschool. On the table where he usually has his afternoon snack there is a plate of cookies. Thinking they are for him, he eats four cookies. His mother comes in and says she made the cookies for a bake sale to raise money for his school.

Steven's preschool class is having a party. Each child has been given two cookies and a cup of punch. Steven eats his two cookies. When he sees another child, Lizzie, leave her seat, he takes one of her cookies and eats it.

Piaget found that a preschool child in the heteronomous morality stage would judge the child who took four cookies as being worse than the one who took just one cookie. In contrast, children who have moved beyond the heteronomous morality stage would consider the child who took one cookie as being naughtier. The reason: Children in the heteronomous morality stage do not take *intention* into account.

Children in the heteronomous stage of moral development also believe in immanent justice. *Immanent justice* is the notion that rules that are broken earn immediate punishment. Preschool children believe that if they do something wrong, they will be punished instantly—even if no one sees them carrying out their misdeeds. In contrast, older children understand that punishments for misdeeds are determined and meted out by people. Children who have moved beyond the heteronomous morality stage have come to understand that one must make judgments about the severity of a transgression based on whether the person intended to do something wrong.

Preschoolers believe in immanent justice. This child may worry that she will be punished instantly even if no one sees her carrying out the misdeed.

EVALUATING PIAGET'S APPROACH TO MORAL DEVELOPMENT. Recent research suggests that although Piaget was on the right track in his description of how moral development proceeds, his approach suffers from the same problem we encountered in his theory of cognitive development. Specifically, Piaget underestimated the age at which children's moral skills are honed.

It is now clear that preschool-age children understand the notion of intentionality by about age three, and this allows them to make judgments based on intent at an earlier age than Piaget supposed. Specifically, when provided with moral questions that emphasize intent, preschool children judge someone who is intentionally bad as more "naughty" than someone who is unintentionally bad but who creates more objective damage. Moreover, by the age of four, they judge intentional lying as being wrong (Yuill & Perner, 1988; Bussey, 1992).

SOCIAL LEARNING APPROACHES TO MORALITY. Social learning approaches to moral development stand in stark contrast to Piaget's approach. While Piaget emphasizes how limitations in preschoolers' cognitive development lead to particular forms of moral *reasoning*, social learning approaches focus more on how the environment in which preschoolers operate produces **prosocial behavior**, helping behavior that benefits others (Spinrad, Eisenberg, & Bernt, 2007; Caputi et al., 2012; Schulz et al., 2013).

prosocial behavior
helping behavior that benefits others

Social learning approaches build upon the behavioral approaches that we first discussed in Chapter 1. They acknowledge that some instances of children's prosocial behavior stem from situations in which they have received positive reinforcement for acting in a morally appropriate way. For instance, when Claire's mother tells her she has been a "good girl" for sharing a box of candy with her brother Dan, Claire's behavior has been reinforced. As a consequence, she is more likely to engage in sharing behavior in the future (Ramaswamy & Bergin, 2009).

Social learning approaches go a step further, however, arguing that not all prosocial behavior has to be directly performed and subsequently reinforced for learning to occur. According to social learning approaches, children also learn moral behavior more indirectly by observing the behavior of others, called *models* (Bandura, 1977). Children imitate models who receive reinforcement for their behavior, and ultimately they learn to perform the behavior themselves. For example, when Claire's friend Jake watches Claire share her candy with her brother, and Claire is praised for her behavior, Jake is more likely to engage in sharing behavior himself at some later point.

Quite a few studies illustrate the power of models and of social learning more generally in producing prosocial behavior in preschool-age children. For example, experiments have shown that children who view someone behaving generously or unselfishly are apt to follow the model's example, subsequently behaving in a generous or unselfish manner themselves when put in a similar situation. The opposite also holds true: If a model behaves selfishly, children who observe such behavior tend to behave more selfishly themselves (Hastings et al., 2007).

Not all models are equally effective in producing prosocial responses. For instance, preschoolers are more apt to model the behavior of warm, responsive adults than of adults who appear colder. Furthermore, models viewed as highly competent or high in prestige are more effective than others.

Children do more than simply mimic unthinkingly behavior that they see rewarded in others. By observing moral conduct, they are reminded of society's norms about the importance of moral behavior as conveyed by parents, teachers, and other powerful authority figures. They notice the connections between particular situations and certain kinds of behavior. This increases the likelihood that similar situations will elicit similar behavior in the observer.

abstract modeling
the process in which modeling paves the way for the development of more general rules and principles

Consequently, modeling paves the way for the development of more general rules and principles in a process called **abstract modeling**. Rather than always modeling the particular behavior of others, older preschoolers begin to develop generalized principles that underlie the behavior they observe. After observing repeated instances in which a model is rewarded for acting in a morally desirable way, children begin the process of inferring and learning the general principles of moral conduct (Bandura, 1991).

From *an educator's* perspective

How might a preschool school teacher encourage a shy child to join a group of preschoolers who are playing together?

GENETIC APPROACHES TO MORALITY. The newest, and highly controversial, approach to morality suggests that particular genes may underlie some aspects of moral behavior. According to this view, preschoolers have a genetic predisposition to behave generously or selfishly.

In one study designed to illustrate this approach, researchers gave preschoolers the opportunity to behave generously by sharing stickers. Those who were more selfish and less generous were more likely to have a variation in a gene called AVPR1A, which regulates a hormone in the brain that is related to social behavior (Avinun et al., 2011).

empathy
the understanding of what another individual feels

It is unlikely that the gene mutation fully accounts for the preschoolers' lack of generosity. The environment in which the children were raised is also likely to play a significant, and perhaps predominant, role in determining moral behavior. Still, the findings are provocative in showing that generosity may have genetic roots.

The roots of empathy grow early, and by the time children reach the age of two or three they are able to offer gifts and spontaneously share with other children and adults.

EMPATHY AND MORAL BEHAVIOR. **Empathy** is the understanding of what another individual feels. According to some developmentalists, empathy lies at the heart of moral behavior.

The roots of empathy grow early. One-year-old infants cry when they hear other infants crying. By ages two and three, toddlers will offer gifts and spontaneously share toys with other children and adults, even if they are strangers (Zahn-Wexler & Radke-Yarrow, 1990).

During the preschool years, empathy continues to grow as children's ability to monitor and regulate their emotional and cognitive responses increases. Some theorists believe that increasing empathy—as well as other positive emotions, such as sympathy and admiration—leads children to behave in a more moral fashion. In addition, some negative emotions—such as anger at an unfair

situation or shame over previous transgressions—also may promote moral behavior (Decety & Jackson, 2006; Bischof-Köhler, 2012; Eisenberg, Spinrad, & Morris, 2014).

The notion that negative emotions may promote moral development is one that Freud first suggested in his theory of psychoanalytic personality development. Recall from Chapter 1 that Freud argued that a child's *superego*, the part of the personality that represents societal do's and don'ts, is developed through resolution of the *Oedipal conflict*. Children come to identify with their same-sex parent, incorporating that parent's standards of morality in order to avoid unconscious guilt raised by the Oedipal conflict.

Whether or not we accept Freud's account of the Oedipal conflict and the guilt it produces, his theory is consistent with more recent findings. These suggest that preschoolers' attempts to avoid experiencing negative emotions sometimes lead them to act in more moral, helpful ways. For instance, one reason children help others is to avoid the feelings of personal distress that they experience when they are confronted with another person's unhappiness or misfortune (Eisenberg, Valiente, & Champion, 2004; Cushman et al., 2013).

Aggression and Violence in Preschoolers: Sources and Consequences

LO 8.12 Describe how aggression develops in preschool-age children.

> *Four-year-old Duane could not contain his anger and frustration anymore. Although he usually was mild mannered, when Eshu began to tease him about the split in his pants and kept it up for several minutes, Duane finally snapped. Rushing over to Eshu, Duane pushed him to the ground and began to hit him with his small, closed fists. Because he was so distraught, Duane's punches were not terribly effective, but they were severe enough to hurt Eshu and bring him to tears before the preschool teachers could intervene.*

Aggression among preschoolers is quite common, though attacks such as this are not. The potential for verbal hostility, shoving matches, kicking, and other forms of aggression is present throughout the preschool period, although the degree to which aggression is acted out changes as children become older.

Eshu's taunting was also a form of aggression. **Aggression** is intentional injury or harm to another person. Infants don't act aggressively; it is hard to contend that their behavior is *intended* to hurt others, even if they inadvertently manage to do so. In contrast, by the time they reach preschool age, children demonstrate true aggression.

aggression
intentional injury or harm to another person

During the early preschool years, some of the aggression is addressed at attaining a desired goal, such as getting a toy away from another person or using a particular space occupied by another person. Consequently, in some ways the aggression is inadvertent, and minor scuffles may in fact be a typical part of early preschool life. It is the rare child who does not demonstrate at least an occasional act of aggression.

On the other hand, extreme and sustained aggression is a cause of concern. In most children, the amount of aggression declines as they move through the preschool years, as do the frequency and average length of episodes of aggressive behavior (Persson, 2005).

emotional self-regulation
the capability to adjust emotions to a desired state and level of intensity

The child's personality and social development contribute to this decline in aggression. Throughout the preschool years, children become better at controlling the emotions that they are experiencing. **Emotional self-regulation** is the capability to adjust emotions to a desired state and level of intensity. Starting at age two, children are able to talk about their feelings, and they engage in strategies to regulate them. As they get older, they develop more effective strategies, learning to better cope with negative emotions. In addition to their increasing self-control, children are also, as we've seen, developing sophisticated social skills. Most learn to use language to express their wishes, and they become increasingly able to negotiate with others (Philippot & Feldman, 2005; Cole et al., 2009; Helmsen, Koglin, & Petermann, 2012).

Aggression, both physical and verbal, is present throughout the preschool period.

Despite these typical declines in aggression, some children remain aggressive throughout the preschool period. Furthermore, aggression is a relatively stable characteristic: The most aggressive preschoolers tend to be the most aggressive children during the school-age years, and the least aggressive preschoolers tend to be the least aggressive school-age children (Tremblay, 2001; Schaeffer, Petras, & Ialongo, 2003; Davenport & Bourgeois, 2008).

instrumental aggression
aggression motivated by the desire to obtain a concrete goal

Boys typically show higher levels of physical, instrumental aggression than girls. **Instrumental aggression** is aggression motivated by the desire to obtain a concrete goal, such as playing with a desirable toy that another child is playing with.

relational aggression
nonphysical aggression that is intended to hurt another person's feelings

On the other hand, although girls show lower levels of instrumental aggression, they may be just as aggressive but in different ways from boys. Girls are more likely to practice **relational aggression**, which is nonphysical aggression that is intended to hurt another person's feelings. Such aggression may be demonstrated through name-calling, withholding friendship, or simply saying mean, hurtful things that make the recipient feel bad (Werner & Crick, 2004; Murray-Close, Ostrov, & Crick, 2007; Valles & Knutson, 2008).

THE ROOTS OF AGGRESSION. How can we explain the aggression of preschoolers? Some theoreticians suggest that to behave aggressively is an instinct, part and parcel of the human condition. For instance, Freud's psychoanalytic theory suggests that we all are motivated by sexual and aggressive instincts (Freud, 1920). According to ethologist Konrad Lorenz, an expert in animal behavior, animals—including humans—share a fighting instinct that stems from primitive urges to preserve territory, maintain a steady supply of food, and weed out weaker animals (Lorenz, 1974).

Similar arguments are made by evolutionary theorists and *sociobiologists*, scientists who consider the biological roots of social behavior. They argue that aggression leads to increased opportunities to mate, improving the likelihood that one's genes will be passed on to future generations. In addition, aggression may help to strengthen the species and its gene pool as a whole, because the strongest survive. Ultimately, then, aggressive instincts promote the survival of one's genes to pass on to future generations (Archer, 2009).

Although instinctual explanations of aggression are logical, most developmentalists believe they are not the whole story. Not only do instinctual explanations fail to take into account the increasingly sophisticated cognitive abilities that humans develop as they get older, but they also have relatively little experimental support. Moreover, they provide little guidance in determining when and how children, as well as adults, will behave aggressively, other than noting that aggression is an inevitable part of the human condition. Consequently, developmentalists have turned to other approaches to explain aggression and violence.

SOCIAL LEARNING APPROACHES TO AGGRESSION. The day after Duane lashed out at Eshu, Lynn, who had watched the entire scene, got into an argument with Ilya. They verbally bickered for a while, and suddenly Lynn balled her hand into a fist and tried to punch Ilya. The preschool teachers were stunned: It was rare for Lynn to get upset, and she had never displayed aggression before.

Is there a connection between the two events? Most of us would answer yes, particularly if we subscribed to the view, suggested by social learning approaches, that aggression is largely a learned behavior. Social learning approaches to aggression contend that aggression is based on observation and prior learning. To understand the causes of aggressive behavior, then, we should look at the system of rewards and punishments that exists in a child's environment.

Social learning approaches to aggression emphasize how social and environmental conditions teach individuals to be aggressive. These ideas grow out of behavioral perspectives, which suggest that aggressive behavior is learned through direct reinforcement. For instance, preschool-age children may learn that they can continue to play with the most desirable toys by aggressively refusing their classmates' requests for sharing. In the parlance of traditional learning theory, they have been reinforced for acting aggressively (by continued use of the toy), and they are more likely to behave aggressively in the future.

But social learning approaches suggest that reinforcement also comes in less direct ways. A good deal of research suggests that exposure to aggressive models leads to increased aggression, particularly if the observers are themselves angered, insulted, or frustrated. For example, Albert Bandura and his colleagues illustrated the power of models in a classic study of preschool-age children (Bandura, Ross, & Ross, 1963). One group of children watched a film of an adult playing aggressively and violently with a Bobo doll (a large, inflated plastic clown designed as a punching bag for children that always returns to an upright position after being pushed down). In comparison, children in another group watched a film of an adult playing sedately with a set of Tinkertoys (see Figure 8-4). Later, the preschool-age children were allowed to play with a number of toys, which included both the Bobo doll and the Tinkertoys. But first, the children were led to feel frustration by being refused the opportunity to play with a favorite toy.

As predicted by social learning approaches, the preschool-age children modeled the behavior of the adult. Those who had seen the aggressive model playing with the Bobo doll were considerably more aggressive than those who had watched the calm, unaggressive model playing with the Tinkertoys.

Later research has supported this early study, and it is clear that exposure to aggressive models increases the likelihood that aggression on the part of observers will follow. These findings have profound consequences, particularly for children who live in communities in which violence is prevalent. For instance, one survey conducted in a city public hospital found that 1 in 10 children under the age of six said they had witnessed a shooting or stabbing. Other research indicates that one-third of the children in some urban neighborhoods have seen a homicide and that two-thirds have seen a serious assault. Such frequent exposure to violence increases the probability that observers will behave aggressively themselves (Farver & Frosch, 1996; Farver et al., 1997; Evans, 2004).

WATCH THIS VIDEO ON MYPSYCHLAB CLASSIC
FOOTAGE OF BANDURA'S BOBO DOLL EXPERIMENT

VIEWING VIOLENCE ON TV: DOES IT MATTER? Even the majority of preschool-age children who are not witnesses to real-life violence are typically exposed to aggression via the medium of television. Children's television programs actually contain higher

Figure 8-4 Modeling Aggression

This series of photos is from Albert Bandura's classic Bobo doll experiment, designed to illustrate social learning of aggression. The photos clearly show how the adult model's aggressive behavior (in the first row) is imitated by children who had viewed the aggressive behavior (second and third rows).

levels of violence (69 percent) than other types of programs (57 percent). In an average hour, children's programs contain more than twice as many violent incidents than other types of programs (Wilson, 2002).

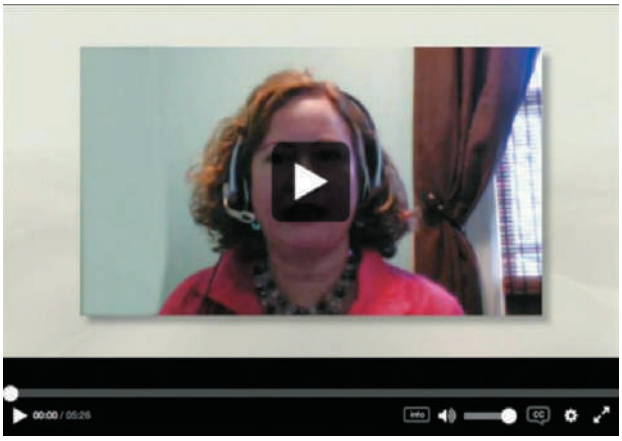
This high level of televised violence and Bandura and others' research findings on modeling violence raise a significant question: Does viewing aggression increase the likelihood that children (and later adults) will enact actual—and ultimately deadly—aggression? It is hard to answer the question definitively, primarily because scientists are unable to conduct true experiments outside laboratory settings.

Although it is clear that laboratory observation of aggression on television leads to higher levels of aggression, evidence showing that real-world viewing of aggression is associated with subsequent aggressive behavior is correlational. (Think, for a moment, of what would be required to conduct a true experiment involving children's viewing habits. It would require that we control children's viewing of television in their homes for extended periods, exposing some to a steady diet of violent shows and others to nonviolent ones—something that most parents would not agree to.)

Despite the fact, then, that the results are primarily correlational, the overwhelming weight of research evidence is clear in suggesting that observation of televised aggression does lead to subsequent aggression. Longitudinal studies have found that children's preferences for violent television shows at age 8 are related to the seriousness of criminal convictions by age 30. Other evidence supports the notion that observation of media violence can lead to a greater readiness to act aggressively, bullying, and an insensitivity to the suffering of victims of violence (Ostrov, Gentile, & Crick, 2006; Christakis & Zimmerman, 2007; Kirsh, 2012).

Television is not the only source of media violence. Many video games contain a significant amount of aggressive behavior, and children are playing such games at high rates. For example, 14 percent of children age three and younger and around 50 percent of those age four to six play video games. Because research conducted with adults shows that playing violent video games is associated with behaving aggressively, children who play video games containing violence may be at higher risk for behaving aggressively (Polman, de Castro, & van Aken, 2008; Bushman, Gollwitzer, & Cruz, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB IN THE REAL WORLD: LEARNING AGGRESSION



Fortunately, social learning principles that lead preschoolers to learn aggression from television and video games suggest ways to reduce the negative influence of the medium. For instance, children can be explicitly taught to view violence with a more skeptical, critical eye. Being taught that violence is not representative of the real world, that the viewing of violence can affect them negatively, and that they should refrain from imitating the behavior they have seen on television can help children interpret the violent programs differently and be less influenced by them (Persson & Musher-Eizenman, 2003; Donnerstein, 2005).

Furthermore, just as exposure to aggressive models leads to aggression, observation of *non*aggressive models can *reduce* aggression. Preschoolers don't just learn from others how to be aggressive; they can also learn how to avoid confrontation and to control their aggression, as we'll discuss later.

COGNITIVE APPROACHES TO AGGRESSION: THE THOUGHTS BEHIND VIOLENCE. Two children, waiting for their turn in a game of kickball, inadvertently knock into one another. One child's reaction is to apologize; the other's is to shove, saying angrily, "Cut it out." Despite the fact that each child bears the same responsibility for the minor event, very different reactions result. The first child interprets the event as an accident, while the second sees it as a provocation and reacts with aggression.

The cognitive approach to aggression suggests that the key to understanding moral development is to examine preschoolers' interpretations of others' behavior and of the environmental context in which a behavior occurs. According to developmental

psychologist Kenneth Dodge and his colleagues, some children are more prone than others to assume that actions are aggressively motivated. They are unable to pay attention to the appropriate cues in a situation and are unable to interpret the behaviors in a given situation accurately. Instead, they assume—often erroneously—that what is happening is related to others' hostility. Subsequently, in deciding how to respond, they base their behavior on their inaccurate interpretation of behavior. In sum, they may behave aggressively in response to a situation that never, in fact, existed (Petit & Dodge, 2003).

For example, consider Jake, who is drawing at a table with Gary. Jake reaches over and takes a red crayon that Gary had just decided he was going to use next. Gary is instantly certain that Jake "knew" that he was going to use the red crayon and that Jake is taking it just to be mean. With this interpretation in mind, Gary hits Jake for "stealing" his crayon.

Although the cognitive approach to aggression provides a description of the process that leads some children to behave aggressively, it is less successful in explaining how certain children come to be inaccurate perceivers of situations in the first place. Furthermore, it fails to explain why such inaccurate perceivers so readily respond with aggression and why they assume that aggression is an appropriate and even desirable response.

On the other hand, cognitive approaches to aggression are useful in pointing out a means to reduce aggression: By teaching preschool-age children to be more accurate interpreters of a situation, we can induce them to be less prone to view others' behavior as motivated by hostility, and consequently less likely to respond with aggression themselves. The guidelines in Are You an Informed Consumer of Development? are based on the various theoretical perspectives on aggression and morality that we've discussed in this chapter.

Are You an Informed Consumer of Development?

Increasing Moral Behavior and Reducing Aggression in Preschool-Age Children

The numerous points of view on the causes of aggression in preschool children are useful for the various methods for encouraging preschoolers' moral conduct and reducing the incidence of aggression they suggest. Here are some of the most practical and readily accomplished strategies (Bor & Bor, 2004; Eisenberg, 2012):

- Provide opportunities for preschool-age children to observe others acting in a cooperative, helpful, prosocial manner. Encourage them to interact with peers in joint activities in which they share a common goal. Such cooperative activities can teach the importance and desirability of working with—and helping—others.
- Encourage children to engage in activities that benefit others, such as sharing. But don't directly reward them for doing it with concrete reinforcements, such as candy or money. Verbal praise is fine.
- Talk to preschoolers about how others must feel in difficult situations, thereby fostering empathy.
- Do not ignore aggressive behavior. Parents and teachers should intervene when they see aggression in preschoolers, and send a clear message that aggression is an unacceptable means to resolve conflicts.
- Help preschoolers devise alternative explanations for others' behavior. This strategy is particularly important for children who are prone to aggression and who may be apt to view others' conduct as more hostile than it actually is. Parents and teachers should help such children see that the behavior of their peers has several possible interpretations.
- Monitor preschoolers' television viewing, particularly the violence that they view. There is good evidence that observation of televised aggression results in subsequent increases in children's levels of aggression. Encourage preschoolers to watch particular shows that are designed, in part, to increase the level of moral conduct, such as *Sesame Street, Dora the Explorer*, or *Daniel Tiger*.
- Help preschoolers understand their feelings. When children become angry—and all children do—they need to learn how to deal with their feelings in a constructive manner. Tell them *specific* things they can do to improve the situation ("I see you're really angry with Jake for not giving you a turn. Don't hit him, but tell him you want a chance to play with the game.")
- Explicitly teach reasoning and self-control. Preschoolers can understand the rudiments of moral reasoning, and they should be reminded why certain behaviors are desirable. For instance, explicitly saying "If you take all the cookies, others will have no dessert" is preferable to saying, "Good children don't eat all the cookies."

Module 8.3 Review

- Piaget believed that preschoolers are in the heteronomous morality stage of moral development, in which rules are seen as invariant and unchangeable. Social learning approaches to moral development emphasize the importance of reinforcement for moral actions and the observation of models of moral conduct. Psychoanalytical and other theories focus on children's empathy with others and their wish to help others so they can avoid unpleasant feelings of guilt themselves.
- Aggression typically declines in frequency and duration as children become more able to regulate their emotions and to use language to negotiate disputes. Ethologists and sociobiologists regard aggression as an innate human characteristic, while proponents of social learning and cognitive approaches focus on learned aspects of aggression.

Journal Writing Prompt

Applying Lifespan Development: Why is it difficult to determine whether watching violence on television affects children? Based on social learning theory, how is watching violence on television, in movies, and in video games likely to affect children? How can this be counteracted?

Epilogue

This chapter examined the social and personality development of preschool-age children, including their development of self-concept. The changing social relationships of preschool-age children can be seen in the changing nature of play. We considered typical styles of parental discipline and their effects later in life, and we examined the factors that lead to child abuse. We discussed the development of a moral sense from several developmental perspectives, and we concluded with a discussion of aggression.

Before moving on to the next chapter, take a moment to reread the prologue about Lora Gray, the four-year-old who understood that her friend was sad and made an effort to cheer her up. Then answer the following questions:

1. In what ways do the actions of Lora indicate that she is developing a theory of mind?
2. How would social learning theorists explain Lora's behavior toward Rosa?
3. What clues to Lora's self-concept do you see in the story? How do you think Lora would answer the question, *Who am I?*
4. Based on the story, how would you characterize the quality and kinds of interactions Lora has with her friends? What type(s) of play would you expect Lora to engage in?

Looking Back

LO 8.1 Describe the major developmental challenges that preschool-age children face.

According to Erik Erikson, preschool-age children initially are in the autonomy-versus-shame-and-doubt stage (18 months to 3 years) in which they develop independence and mastery over their physical and social worlds or feel shame, self-doubt, and unhappiness. Later, in the initiative-versus-guilt stage (ages 3 to 6), preschool-age children face conflicts between the desire to act independently and the guilt that comes from the unintended consequences of their actions.

LO 8.2 Explain how preschool-age children develop a concept of themselves.

Preschoolers' self-concepts are formed partly from their own perceptions and estimations of their characteristics, partly from their parents' behavior toward them, and partly from cultural influences.

LO 8.3 Explain how preschool-age children develop a sense of racial identity and gender.

Preschool-age children form racial attitudes largely in response to their environment, including parents and other influences. Gender differences emerge early and conform to social stereotypes about what is appropriate and inappropriate for each sex. The strong gender expectations held by preschoolers are explained in different ways by different theorists. Some point to genetic factors as evidence for a biological explanation of gender expectations. Freud's psychoanalytic theories use a framework based on the subconscious. Social learning theorists focus on environmental influences, including parents, teachers, peers, and the media, while cognitive theorists propose that children form gender schemas, cognitive frameworks that organize information that the children gather about gender.

LO 8.4 Describe the sorts of social relationships that preschool-age children engage in.

Preschool social relationships begin to encompass genuine friendships, which involve trust and endure over time.

LO 8.5 Explain how and why preschool-age children play.

Older preschoolers engage in more constructive play than functional play. They also engage in more associative and

cooperative play than younger preschoolers, who do more parallel and onlooker playing.

LO 8.6 Summarize how thinking changes in the preschool years.

Preschoolers begin to understand how others think and why they do the things they do. Children begin to grasp the difference between reality and imagination and begin to take part consciously in imaginative play.

LO 8.7 Describe ways in which family relationships affect the development of preschool-age children.

Families change in nature and structure over the years, but a strong and positive home environment is essential to children's healthy development.

LO 8.8 Describe the kinds of disciplinary styles parents employ with preschool-age children and what effects they have.

Disciplinary styles differ both individually and culturally. In the United States and other Western societies, parents' styles tend to be mostly authoritarian, permissive, uninvolved, and authoritative. The authoritative style is regarded as the most effective. Children of authoritarian and permissive parents may develop dependency, hostility, and low self-control, while children of uninvolved parents may feel unloved and emotionally detached. Children of authoritative parents tend to be more independent, friendly, self-assertive, and cooperative.

LO 8.9 List the factors that contribute to child abuse and neglect.

Child abuse, which may be either physical or psychological, occurs especially in stressful home environments. Firmly held notions regarding family privacy and the use of physical punishment in childrearing contribute to the high rate of abuse in the United States. Moreover, the cycle of violence hypothesis points to the likelihood that persons who were abused as children may turn into abusers as adults.

LO 8.10 Define resilience, and describe how it can help abused children.

Children who have been abused often survive their backgrounds by relying on the temperamental quality of resilience.

LO 8.11 Explain how preschool-age children develop a moral sense.

Piaget believed that preschool-age children are in the heteronomous morality stage of moral development, characterized by a belief in external, unchangeable rules of conduct and sure, immediate punishment for all misdeeds. In contrast, social learning approaches to morality emphasize interactions between environment and behavior in moral development, in which models of behavior play an important role. Some developmentalists believe that moral behavior is rooted in a child's development of empathy. Other emotions, including the negative emotions of anger and shame, may also promote moral behavior.

LO 8.12 Describe how aggression develops in preschool-age children.

Aggression, which involves intentional harm to another person, begins to emerge in the preschool years. As children age and improve their language skills, acts of aggression typically decline in frequency and duration. Some ethologists, such as Konrad Lorenz, believe that aggression is simply a biological fact of human life, a belief held also by many sociobiologists, who focus on competition within species to pass genes on to the next generation. Social learning theorists focus on the role of the environment, including the influence of models and social reinforcement as factors influencing aggressive behavior. The cognitive approach to aggression emphasizes the role of interpretations of the behaviors of others in determining aggressive or nonaggressive responses.

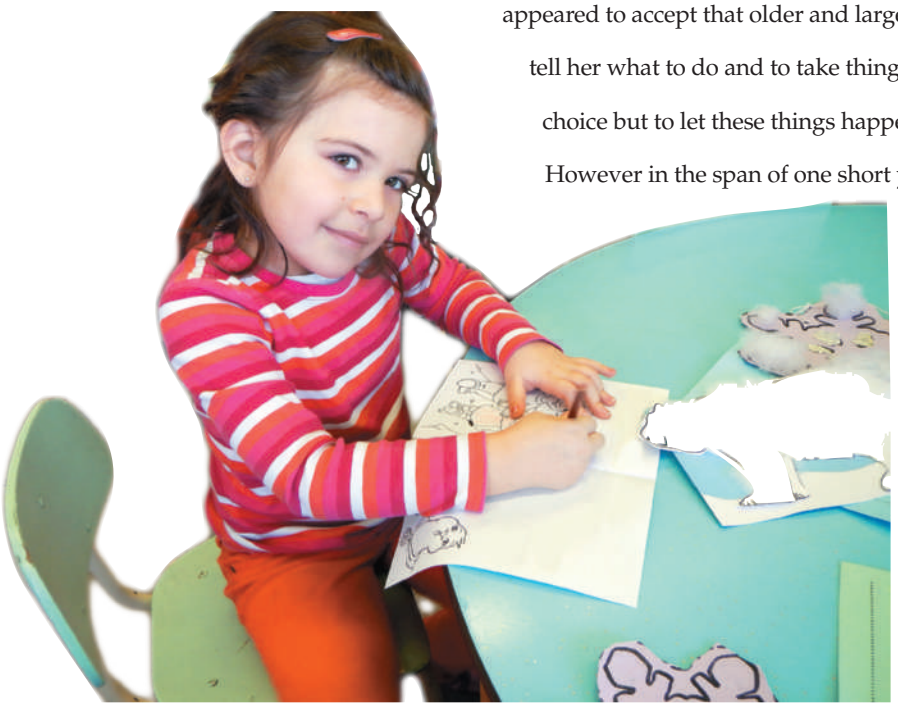
Key Terms and Concepts

psychosocial development 268
initiative-versus-guilt stage 268
self-concept 269
collectivistic orientation 269
individualistic orientation 269
race dissonance 270
identification 272
gender identity 274
gender schema 274
gender constancy 274
androgynous 274
functional play 276
constructive play 276
parallel play 276
onlooker play 277
associative play 277
cooperative play 277
authoritarian parents 281
permissive parents 281
authoritative parents 281
uninvolved parents 281
cycle of violence hypothesis 285
psychological maltreatment 285
resilience 286
moral development 288
prosocial behavior 289
abstract modeling 290
empathy 290
aggression 291
emotional self-regulation 291
instrumental aggression 292
relational aggression 292

SUMMARY

3 Putting It All Together

The Preschool Years

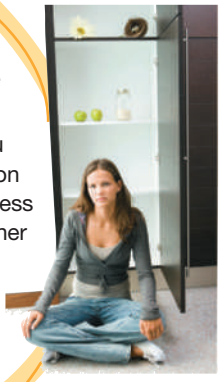


JULIE, a three-year-old in her first days of preschool, was initially shy and passive. She appeared to accept that older and larger children, particularly boys, had a right to tell her what to do and to take things from her that they wanted. She saw little choice but to let these things happen, since she was powerless to stop them. However in the span of one short year, Julie decided that she had enough. Instead of accepting the "rule" that bigger kids could do whatever they wanted, she would protest against its unfairness. Instead of silently allowing other kids to dominate her, she would use her newfound moral sense, together with her evolving language skills, to warn them off. Julie had put together all the developmental tools that she now had to make her world a fairer and better place.

WHAT WOULD YOU DO?

- What would you do to promote Julie's development?
- What specific advice would you give to Julie's parents and teacher on how to help Julie overcome her shyness and interact more effectively with other children?

What's your response?



WHAT WOULD A PARENT DO?

- How would you help Julie become more assertive both at home and at school?
- How would you help her prepare to deal with bullies in preschool?

What's your response?

Physical Development

- Julie grew bigger, heavier, and stronger during the preschool years.
- Her brain grew and with it her cognitive abilities, including the ability to plan and to use language as a tool.
- She learned to use and control her gross and fine motor skills.

Cognitive Development

- During the preschool years, Julie's memory capabilities increased.
- She watched others and learned from her peers and from adults how to handle different situations.
- She also used her growing language skills to function more effectively.

Social and Personality Development

- As with other preschool-age children, Julie's play was a way to grow socially, cognitively, and physically.
- Julie learned the rules of play, such as turn taking and playing fairly.
- She also developed theories of mind that help her to understand what others are thinking.
- She developed the beginnings of a sense of justice and moral behavior.
- Julie was able to adjust her emotions to a desired intensity level and can use language to express her wishes and deal with others.

WHAT WOULD A NURSE DO?

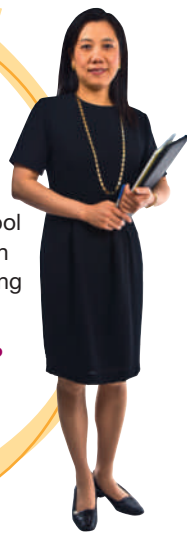
- How would you help Julie's parents to provide appropriate kinds of discipline for Julie?
- How would you help her parents to optimize their home environment to promote physical, cognitive, and social development for their children?

What's your response?

WHAT WOULD AN EDUCATOR DO?

- What strategies would you use to promote cognitive and social development?
- How would you deal with instances of bullying in your preschool classroom, both in terms of children who were victimized as well as dealing with the bully?

What's your response?



Chapter 9

Physical and Cognitive Development in Middle Childhood

Learning Objectives

LO 9.1 Describe ways in which children grow during middle childhood and factors that influence their growth.

LO 9.2 Outline the course of motor development in middle childhood.

LO 9.3 Summarize the main physical and mental health concerns of school-age children.

LO 9.4 Describe the sorts of special needs that may become apparent in school-age children and how can they be met.

LO 9.5 Summarize the Piagetian view of cognitive development in middle childhood.

LO 9.6 Explain how children develop cognitively in middle childhood according to information processing approaches.

LO 9.7 Summarize Vygotsky's interpretation of cognitive development during middle childhood.

LO 9.8 Describe how language develops during middle childhood.

LO 9.9 Explain how children learn to read.

LO 9.10 Summarize what schools teach beyond the basics in middle childhood.

LO 9.11 Describe how intelligence is measured and what controversies arise from measuring it.

LO 9.12 Describe how children with intellectual disabilities and children who are intellectually gifted are educated in middle childhood.

Chapter Overview

Prologue: A Heads-Up Play

It was nine-year-old Jan Vega's first Little League baseball game. With strong encouragement from her parents, she had tried out for the local team—one of only two girls to do so—and now she was a Yankee.

Jan was assigned to second base. She kept her eyes on the ball and her glove ready at all times, but play after play, the ball went to the shortstop, who threw it to first base for the out. Though disappointed, Jan remained alert. "Baseball is more than batting and catching," her coach always said. "To play well, you have to use your head."

Now it was the last inning. The Yankees had a one-run lead, but the Orioles had the final at-bats and their best batter was standing at the plate, with only one out and a runner on first base. The game was on the line.

Later, Jan would say that she saw the ball coming straight toward the plate as the batter swung. That she knew it would meet the bat squarely and head right up the middle. That the shortstop was in no position to field it. That it was *her* ball.

As the ball hit the bat she ran to her right, stretched to snare the bouncing ball, tagged second base to get the runner out, and slung the ball to first to complete the double play. Game over. Jan Vega had helped her team to victory. ■

Looking Ahead

Jan Vega had come a long way since preschool. Then, she would have found it impossible to plot a course to intercept a small, moving object, time a lunge to make a catch with precision, and twist herself around to toss a ball accurately in the opposite direction.

Middle childhood is characterized by milestones like this one as children's physical, cognitive, and social skills ascend to new heights. Beginning at age six and continuing to the start of adolescence at around age 12, the period of middle childhood is often referred to as the "school years" because it marks the beginning of formal education for most children. Sometimes the physical and cognitive growth that occurs during middle childhood is gradual; other times it is sudden; but always it is remarkable.

We begin our consideration of middle childhood by examining physical and motor development. We discuss how children's

During middle childhood, children's physical, cognitive, and social skills ascend to new heights.

bodies change and the problems of malnutrition and—the other side of the coin—childhood obesity. We also consider the development of children with special needs.

Next, we turn to the development of children's cognitive abilities in middle childhood. We examine several approaches put forward to describe and explain cognitive development, including Piagetian and information processing theories and the important ideas of Vygotsky. We look at language development and the questions surrounding bilingualism—an increasingly pressing social policy issue in the United States.

Finally, we consider several issues involving schooling. After discussing the scope of education throughout the world, we examine the critical skill of reading and the nature of multicultural education. The chapter ends with a discussion of intelligence, a characteristic closely tied to school success. We look at the nature of IQ tests and at the education of children who are either significantly below or above the intellectual norm.

Physical Development

Cinderella, dressed in yella,

went upstairs to kiss her fellah.

But she made a mistake and she kissed a snake.

How many doctors did it take? One, two, …

While the other girls chanted the classic jump-rope rhyme, Kat proudly displayed her newly developed ability to jump backwards. In second grade, Kat was starting to get quite good at jumping rope. In first grade, she simply had not been able to master it. But over the summer, she had spent many hours practicing, and now that practice seemed to be paying off.

As Kat is gleefully experiencing, middle childhood is a time when children make great physical strides, mastering all kinds of new skills as they grow bigger and stronger. How does this progress occur? We'll first consider typical physical growth during middle childhood and then turn our attention to a look at children with special needs.

The Growing Body

LO 9.1 Describe ways in which children grow during middle childhood and factors that influence their growth.

Slow but steady. If three words could characterize the nature of growth during middle childhood, it would be these. Especially when compared to the swift growth during the first five years of life and the remarkable growth spurt characteristic of adolescence, middle childhood is relatively tranquil. On the other hand, the body has not shifted into neutral. Physical growth continues, although at a more stately pace than it did during the preschool years.

Variations of 6 inches in height between children of the same age are not unusual and well within normal ranges.

HEIGHT AND WEIGHT CHANGES. While they are in elementary school, children in the United States grow, on average, 2 to 3 inches a year. By the age of 11, the average height for girls is 4 feet, 10 inches and the average height for boys is slightly shorter at 4 feet, 9 1/2 inches. This is the only time during the life span when girls are, on average, taller than boys. This height difference reflects the slightly more rapid physical development of girls, who start their adolescent growth spurt around the age of 10.

Weight gain follows a similar pattern. During middle childhood, both boys and girls gain around 5 to 7 pounds a year. Weight is also redistributed. As the rounded look of "baby fat" disappears, children's bodies become more muscular and their strength increases.

These average height and weight increases disguise significant individual differences, as anyone who has seen a line of fourth graders walking down a school corridor has doubtless noticed. It is not unusual to see children of the same age who are 6 or 7 inches apart in height.

Inadequate nutrition and disease affect growth significantly. Children in poorer areas of cities such as Calcutta, Hong Kong, and Rio de Janeiro are smaller than their counterparts in affluent areas of the same cities.

CULTURAL PATTERNS OF GROWTH. Most children in North America receive sufficient nutrients to grow to their full potential. In other parts of the world, however, inadequate nutrition and disease take their toll, producing children who are shorter and who weigh less than they would if they had sufficient nutrients. The discrepancies can be dramatic: Children in poorer areas of cities, such as Calcutta, Hong Kong, and Rio de Janeiro, are smaller than their counterparts in affluent areas of the same cities.

In the United States, most variations in height and weight are the result of different people's unique genetic inheritance, including genetic factors relating to racial and ethnic background. For instance, children from Asian and Oceanic Pacific backgrounds tend to be shorter, on average, than those with northern and central European heritages. In addition, the rate of growth during childhood is generally more rapid for blacks than for whites (Deurenberg, Deurenberg-Yap, Guricci, 2002; Deurenberg et al., 2003).

Of course, even within particular racial and ethnic groups, there is significant variation between individuals. Moreover, we cannot attribute racial and ethnic differences solely to genetic factors because dietary customs as well as possible variations in levels of affluence also may contribute to the differences. In addition, severe stress—brought on by factors such as parental conflict or alcoholism—can affect the functioning of the pituitary gland, thereby affecting growth (Koska et al., 2002).

PROMOTING GROWTH WITH HORMONES: SHOULD SHORT CHILDREN BE MADE TO GROW? Being tall is considered an advantage in most of U.S. society. Because of this cultural preference, parents sometimes worry about their children's growth if their children are short. To the manufacturers of Protropin, an artificial human growth hormone that can make short children taller, there's a simple solution: Administer the drug to make the children grow taller than they naturally would (Sandberg & Voss, 2002; Lagrou et al., 2008; Pinquart, 2013).

Should children be given such drugs? The question is a relatively new one: Artificial hormones to promote growth have become available only in the last two decades. Although tens of thousands of children who have insufficient natural growth hormone are taking such drugs, some observers question whether shortness is a serious enough problem to warrant the use of the drug. Certainly, one can function well in society without being tall. Furthermore, the drug is costly and has potentially dangerous side effects. In some cases, the drug may lead to the premature onset of puberty, which may—ironically—restrict later growth.

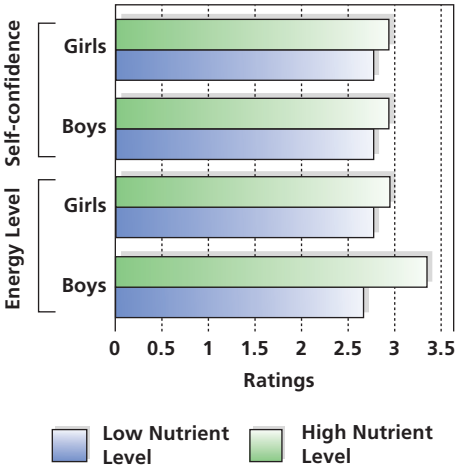
From *a health-care provider's* perspective

Under what circumstances would you recommend the use of a growth hormone such as Protropin? Is shortness primarily a physical or a cultural problem?

Figure 9-1 Nutritional Benefits

Children who received higher levels of nutrients had more energy and felt more self-confident than those whose nutritional intake was lower. What policy implications does this finding suggest?

(**Source:** Based on Barrett & Radke-Yarrow, 1985.)



On the other hand, there is no denying that artificial growth hormones are effective in increasing children's height, in some cases adding well over a foot in height to extremely short children, placing them within normal height ranges. Ultimately, until long-term studies of the safety of such treatments are completed, parents and medical personnel must carefully weigh the pros and cons before administering the drug to their children (Ogilvy-Stuart & Gleeson, 2004; Webb et al., 2012; Poidvin et al., 2014).

NUTRITION. As we discussed earlier, there is a rather obvious relationship between size and nutrition. But size isn't the only area affected by children's levels of nutrition. For instance, longitudinal studies over many years in Guatemalan villages show that children's nutritional backgrounds are related to several dimensions of social and emotional functioning at school age. Children who had received more nutrients were more involved with their peers, showed more positive emotion, and had less anxiety than their peers who had received less adequate nutrition. Better nutrition also made children more eager to explore new environments, more persistent in frustrating situations, and more alert at some types of activities, and these children displayed generally higher energy levels and more self-confidence (Barrett & Frank, 1987; Nyaradi et al., 2013; see Figure 9-1).

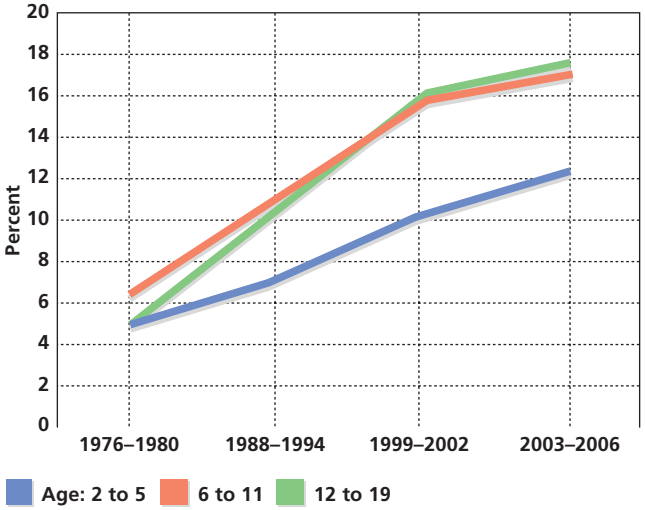
Nutrition is also linked to cognitive performance. For instance, in one study, children in Kenya who were well nourished performed better on a test of verbal abilities and on other cognitive measures than those who had mild to moderate undernutrition. Other research suggests that malnutrition may influence cognitive development by dampening children's curiosity, responsiveness, and motivation to learn (Wachs, 2002; Grigorenko, 2003; Jackson, 2015).

CHILDHOOD OBESITY. In spite of a widely held view that thinness is a virtue, at least in the United States, increasing numbers of children are becoming obese. *Obesity* is defined as body weight that is more than 20 percent above the average for a person of a given age and height. By this definition, 15 percent of U.S. children are obese—a proportion that has tripled since the 1960s (see Figure 9-2; Brownlee, 2002; Dietz, 2004; Mann, 2005).

Figure 9-2 Obesity in Children

Obesity in children from ages 6 to 12 has risen dramatically over the past three decades.

(**Source:** Centers for Disease Control and Prevention, retrieved from World Wide Web, 2009.)



The costs of childhood obesity last a lifetime. Children who are obese are more likely to be overweight as adults and have a greater risk of heart disease, type 2 diabetes, cancer, and other diseases. Some scientists believe that an epidemic of obesity may be leading to a decline in life span in the United States (Park, 2008; Mehlenbeck, Farmer, & Ward, 2014).

Obesity is caused by a combination of genetic and social characteristics as well as diet. Particular inherited genes are related to obesity and predispose certain children to be overweight. For example, adopted children tend to have weights that are more similar to those of their birth parents than to those of their adoptive parents (Bray, 2008; Skledar et al., 2012; Maggi et al., 2015).

Social factors also enter into children's weight problems. Children need to learn to control their eating themselves. Parents who are particularly controlling and directive regarding their children's eating may produce children who lack internal controls to regulate their own food intake (Johnson & Birch, 1994; Faith, Johnson, & Allison, 1997; Wardle, Guthrie, & Sanderson, 2001).

Poor diets also contribute to obesity. Despite their knowledge that certain foods are necessary for a balanced, nutritious

diet, many parents provide their children with too few fruits and vegetables and more fats and sweets than recommended (see Figure 9-3). School lunch programs have sometimes contributed to the problem by failing to provide nutritious options (Johnston, Delva, & O'Malley, 2007; Story, Nanney, & Schwartz, 2009).

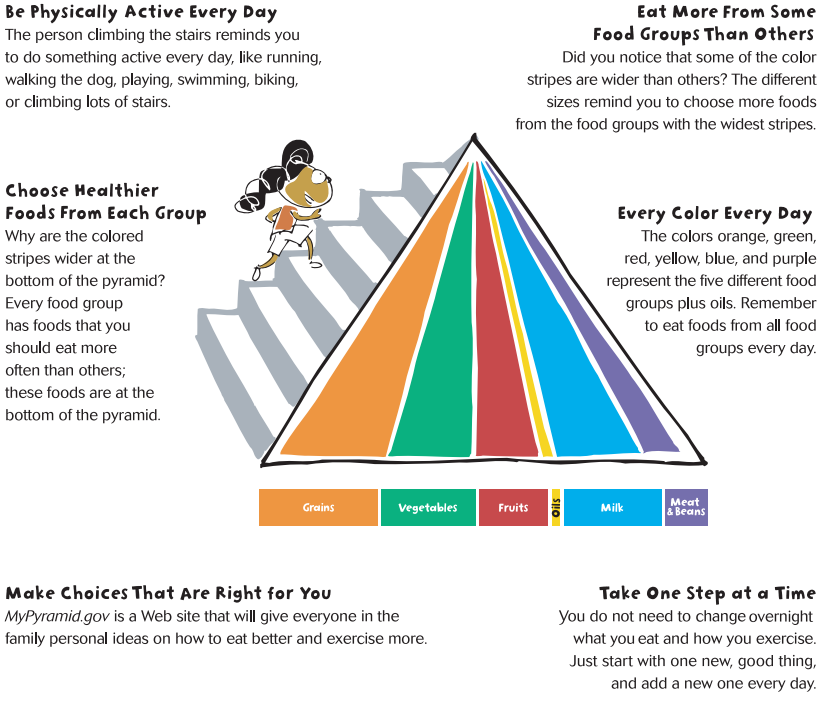
Given how energetic children in middle childhood can be, it is surprising that a major factor in childhood obesity is a lack of exercise. School-age children, by and large, tend to engage in relatively little exercise and are not particularly fit. For instance, around 40 percent of boys age 6 to 12 are unable to do more than one pull-up, and a quarter can't do any. Furthermore, children have shown little or no improvement in the amount of exercise they get, despite national efforts to increase the level of fitness of school-age children, in part because many schools have reduced the time available for recess and gym classes. From the ages of 6 to 18, boys decrease their physical activity by 24 percent and girls by 36 percent (Moore, Gao, & Bradlee, 2003; Sallis & Glanz, 2006; Weiss & Raz, 2006).

Why, when our visions of childhood include children running happily on school playgrounds, playing sports, and chasing one another in games of tag, is the actual level of exercise relatively low? One answer is that many kids are inside their homes, watching television and computer screens. Such sedentary activities not only keep children from exercising but often also encourages them to snack while viewing TV or surfing the Web (Pardee et al., 2007; Landhuis et al., 2008; Goldfield, 2012; Cale & Harris, 2013; also see the Are You an *Informed Consumer of Development*? feature).

Figure 9-3 Balanced Diet?

Recent studies have found that the diet of children is almost the opposite of that recommended by the U.S. Department of Agriculture, a situation that can lead to an increase in obesity. The typical 10-year-old is 10 pounds heavier than a decade ago.

(**Source:** USDA, 1999; NPD Group, 2004.)



WATCH THIS VIDEO ON MYPSYCHLAB THE PROBLEM OF CHILDHOOD OBESITY

Motor Development

LO 9.2 **Outline the course of motor development in middle childhood.**

The fact that the fitness level of school-age children is not as high as we would desire does not mean that such children are physically incapable. In fact, even without regular exercise, children's gross and fine motor skills develop substantially over the course of the school years.

GROSS MOTOR SKILLS. One important improvement in gross motor skills is in the realm of muscle coordination. When watching a softball player pitch a ball past a batter to her catcher, a runner reach the finish line in a race, or Kat, the jump-roper described earlier in the chapter, we are struck by the huge strides that these children have made since the more awkward days of preschool.

Are You an Informed Consumer of Development?

Keeping Children Fit

Here is a brief portrait of a contemporary American: Sam works all week at a desk and gets no regular physical exercise. On weekends he spends many hours sitting in front of the TV, often snacking on sodas and sweets. Both at home and at restaurants, his meals feature high-calorie, fat-saturated foods. (Segal & Segal, 1992, p. 235)

Although this sketch could apply to many adult men and women, Sam is actually a six-year-old. He is one of many school-age children in the United States who get little or no regular exercise and who consequently are physically unfit and at risk for obesity and other health problems.

Several things can be done to encourage children to become more physically active (Tyre & Scelfo, 2003; Okie, 2005):

- Make exercise fun. In order for children to build the habit of exercising, they need to find it enjoyable. Activities that keep children on the sidelines or that are overly competitive may give children with inferior skills a lifelong distaste for exercise.
- Be an exercise role model. Children who see that exercise is a regular part of the lives of their parents, teachers, or adult friends may come to think of fitness as a regular part of their lives, too.
- Gear activities to the child's physical level and motor skills. For instance, use child-size equipment that can make participants feel successful.
- Encourage the child to find a partner. It could be a friend, a sibling, or a parent. Exercising can involve a variety of activities, such as snowboarding or hiking, but almost all activities are carried out more readily if someone else is doing them too.
- Start slowly. Sedentary children—those who aren't used to regular physical activity—should start off gradually. For instance, they could start with 5 minutes of exercise a day, seven days a week. Over 10 weeks, they could move toward a goal of 30 minutes of exercise three to five days a week.
- Urge participation in organized sports activities, but do not push too hard. Not every child is athletically inclined, and pushing too hard for involvement in organized sports may backfire. Make participation and enjoyment the goals of such activities, not winning.
- Don't make physical activity, such as jumping jacks or push-ups, a punishment for unwanted behavior. Instead, schools and parents should encourage children to participate in organized programs that seek to involve children in ways that are enjoyable.
- Provide a healthy diet. Children who eat a healthy diet will have more energy to engage in physical activity than those who have a diet heavy in soda and snack foods.

During middle childhood, children master many types of skills that earlier they could not perform well. For instance, most school-age children can readily learn to ride a bike, ice skate, swim, and skip rope (Cratty, 1986; see Figure 9-4).

Do boys and girls differ in their motor skills? Years ago developmentalists concluded that gender differences in gross motor skills became increasingly pronounced during these years, with boys outperforming girls (Espenschade, 1960). However, when comparisons are made between boys and girls who regularly take part in similar activities—such as softball—gender variations in gross motor skills are minimal (Hall & Lee, 1984; Jurimae & Saar, 2003).

During middle childhood, children master many types of skills that earlier they could not perform well, such as those that depend on fine motor coordination.

Why the change? Expectations probably played a role. Society did not expect girls to be highly physically active and told girls that they would do worse than boys in sports, and the girls' performance reflected that message.

Today, however, society's message has changed, at least officially. For instance, the American Academy of Pediatrics suggests that boys and girls should engage in the same sports and games, and that they can do so together in mixed-gender groups. There is no reason to separate the sexes in physical exercise and sports until puberty, when the smaller size of females begins to make them more susceptible to injury in contact sports (Vilhjalmsson & Kristjansdottir, 2003; American Academy of Pediatrics, 2004; Kanters et al., 2013).

Figure 9-4 Gross Motor Skills

Gross motor skills developed by children between the ages of 6 and 12 years.

(**Source:** Adapted from Cratty, 1979, p. 222.)

6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years
						
Girls superior in accuracy of movement; boys superior in more forceful, less complex acts. Can throw with the proper weight shift and step. Acquire the ability to skip.	Can balance on one foot with eyes closed. Can walk on a 2-inch-wide balance beam without falling off. Can hop and jump accurately into small squares (hopscotch). Can correctly execute a jumping-jack exercise.	Can grip objects with 12 pounds of pressure. Can engage in alternate rhythmical hopping in a 2-2, 2-3, or 3-3 pattern. Girls can throw a small ball 33 feet; boys can throw a small ball 59 feet. The number of games participated in by both sexes is the greatest at this age.	Girls can jump vertically 8.5 inches over their standing height plus reach; boys can jump vertically 10 inches. Boys can run 16.6 feet per second; girls can run 16 feet per second.	Can judge and intercept directions of small balls thrown from a distance. Both girls and boys can run 17 feet per second.	Boys can achieve standing broad jump of 5 feet; girls can achieve standing broad jump of 4.5 feet.	Can achieve high jump of 3 feet.

FINE MOTOR SKILLS. Typing at a computer keyboard. Writing in cursive with pen and pencil. Drawing detailed pictures. These are just some of the accomplishments that depend on improvements in fine motor coordination that occur during early and middle childhood. Six- and seven-year-olds are able to tie their shoes and fasten buttons; by age 8, they can use each hand independently; and by 11 and 12, they can manipulate objects with almost as much capability as they will show in adulthood.

One reason for advances in fine motor skills is that the amount of myelin in the brain increases significantly between the ages of six and eight (Lecours, 1982). *Myelin* provides protective insulation that surrounds parts of nerve cells. Because increased levels of myelin raise the speed at which electrical impulses travel between neurons, messages can reach muscles more rapidly and control them better.

Physical and Mental Health during Middle Childhood

LO 9.3 **Summarize the main physical and mental health concerns of school-age children.**

> *Imani was miserable. Her nose was running, her lips were chapped, and her throat was sore. Although she had been able to stay home from school and spend the day watching TV, she still felt that she was suffering mightily.*

Despite her misery, Imani's situation is not so bad. She'll get over the cold in a few days and be no worse for having experienced it. In fact, she may be a little *better* off, for she is now immune to the specific cold germs that made her ill in the first place.

Imani's cold may end up being the most serious illness that she gets during middle childhood. For most children, this is a period of robust health, and most of the ailments they do contract tend to be mild and brief. Routine immunizations during childhood have produced a considerably lower incidence of the life-threatening illnesses that 50 years ago claimed the lives of a significant number of children.

Illness is not uncommon, however. For instance, more than 90 percent of children are likely to have at least one serious medical condition over the six-year period of middle childhood, according to the results of one large survey. And although most children have short-term illnesses, about one in nine has a chronic, persistent condition, such as repeated migraine headaches. And some illnesses are actually becoming more prevalent (Dey & Bloom, 2005).

asthma
a chronic condition characterized by periodic attacks of wheezing, coughing, and shortness of breath

ASTHMA. Asthma is among the diseases that have shown a significant increase in prevalence over the last several decades. **Asthma** is a chronic condition characterized by periodic attacks of wheezing, coughing, and shortness of breath. More than 7 million U.S. children suffer from the disorder, and worldwide the number is more than 150 million. Racial and ethnic minorities are particularly at risk for the disease (Celano, Holsey, & Kobrynski, 2012; Bowen, 2013; Konis-Mitchell et al., 2014).

Asthma occurs when the airways leading to the lungs constrict, partially blocking the passage of oxygen. Because the airways are obstructed, more effort is needed to push air through them, making breathing more difficult. As air is forced through the obstructed airways, it makes the whistling sound called wheezing.

Asthma attacks are triggered by a variety of factors. Among the most common are respiratory infections (such as colds or flu), allergic reactions to airborne irritants (such as pollution, cigarette smoke, dust mites, and animal dander and excretions), stress, and exercise. Sometimes even a sudden change in air temperature or humidity is enough to bring on an attack (Noonan & Ward, 2007; Marin et al., 2009; Ross et al., 2012).

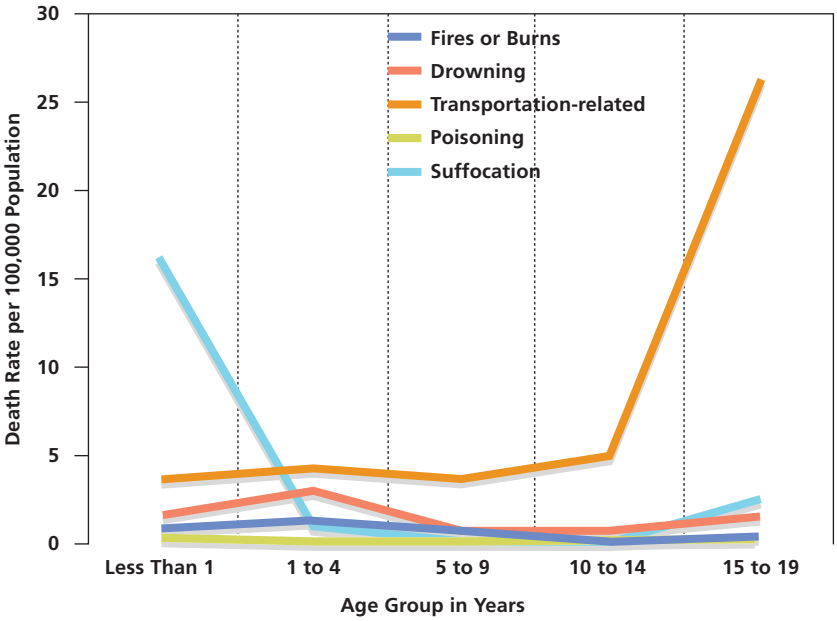
One of the most puzzling questions about asthma is why more and more children are suffering from it. Some researchers suggest that increasing air pollution has led to the rise; others believe that cases of asthma that might have been missed in the past are being identified more accurately. Still others have suggested that exposure to "asthma triggers," such as dust, may be increasing because new buildings are more weatherproof—and therefore less drafty—than old ones, and consequently the flow of air within them is more restricted.

Although asthma and other illnesses are threats to children's well-being during middle childhood, the greater potential risk comes from the possibility of injury. During this period, children are more likely to suffer a life-threatening injury from an accident than a severe illness, as we discuss next (Woolf & Lesperance, 2003).

Figure 9-5 Injury Death Rates by Age

During middle childhood, the most frequent causes of accidental death are transportation-related. Why do you think transportation-related deaths soar just after middle childhood?

(**Source:** Borse et al., 2008.)



ACCIDENTS. The increasing independence and mobility of school-age children lead to new safety issues. Between the ages of 5 and 14, the rate of injury for children increases. Boys are more apt to be injured than girls, probably because their overall level of physical activity is greater. Some ethnic and racial groups are at greater risk than others: Injury death rates are highest for American Indian and Alaska Natives, and lowest for Asian and Pacific Islanders. Whites and African Americans have approximately the same death rates from injuries (see Figure 9-5; Noonan, 2003a; Borse et al., 2008).

The increased mobility of school-age children is a source of several kinds of accidents. For instance, children who regularly walk to school on their own, many traveling such a distance alone for the first time in their lives, face the risk of being hit by cars and trucks. Because of their lack of experience, they may misjudge distances when calculating just how far they are from an oncoming vehicle. Furthermore,

bicycle accidents pose an increasing risk, particularly as children more frequently venture out onto busy roads (Schnitzer, 2006).

The most frequent sources of injury to children are automobile accidents and other transportation injuries. Auto crashes annually kill 4 out of every 100,000 children between the ages five and nine. Fires and burns, drowning, and gun-related deaths follow in frequency (Field & Behrman, 2002; Schiller & Bernadel, 2004).

Two ways to reduce auto and bicycle injuries are to use seat belts consistently inside the car and to wear appropriate protective gear outside. Bicycle helmets have significantly reduced head injuries, and in many localities their use is mandatory. Similar protection is available for other activities; for example, knee and elbow pads have proven to be important sources of injury reduction for roller-blading and skateboarding (Blake et al., 2008; Lachapelle, Noland, & Von Hagen, 2013).

PSYCHOLOGICAL DISORDERS

> *Ben Cramer, eight, loves baseball and mystery stories. He has a dog, Frankie, and a blue racing bike. Ben also has bipolar disorder, a serious psychological disorder. Engaged in his schoolwork 1 minute, he'll refuse to even look at his teacher the next. Often a good friend, he'll suddenly lash out at the other children in the class. Sometimes, he believes he can do anything: touch fire and not get burned or jump off the roof and fly. Other times, he feels so sad and small, he writes poems about dying.*

Bipolar disorder such as Ben's is diagnosed when a person cycles back and forth between two emotional states: unrealistically high spirits and energy at one extreme, and depression on the other. For years most people neglected the symptoms of such psychological disorders in children, and even today parents and teachers may overlook their presence. Yet it is a common problem: One in five children and adolescents has a psychological disorder that produces at least some impairment. For example, about 5 percent of preteens suffer from childhood depressive disorder, and 13 percent of children between 9 and 17 experience an anxiety disorder. The estimated cost of treatment of children's psychological disorders is $250 billion (Cicchetti & Cohen, 2006; Kluger, 2010; Holly et al., 2015).

In part, the neglect of children's psychological disorders occurs because children's symptoms are not entirely consistent with the ways adults express similar disorders. Even when childhood psychological disorders are diagnosed, the correct treatment is not always apparent. For example, the use of antidepressant drugs has become a popular treatment for a variety of childhood psychological disorders, including depression and anxiety. More than 10 million prescriptions are written annually for children under the age of 18. Surprisingly, though, antidepressant drugs have never been approved by governmental regulators for use with children. Still, because the drugs have received approval for adult use, it is perfectly legal for physicians to write prescriptions for children (Goode, 2004).

Advocates for the increased use of antidepressants, such as Prozac, Zoloft, Paxil, and Wellbutrin, for children suggest that depression and other psychological disorders can be treated quite successfully using drug therapies. In many cases, more traditional nondrug therapies that largely employ traditional psychotherapy simply are ineffective. In such cases, drugs can provide the only form of relief. Furthermore, at least one clinical test has shown that the drugs are effective with children (Barton, 2007; Lovrin, 2009; Hirschtritt et al., 2012).

Critics, however, contend that there is little evidence for the long-term effectiveness of antidepressants in children. Even worse, no one knows the consequences of the use of antidepressants on the children's developing brains nor the long-term consequences more generally. Little is known about the correct dosages for children of given ages or sizes. Furthermore, some observers suggest that the use of special children's

Psychological disorders, such as bipolar disorder and depression, can impair children's thinking and behavior.

versions of the drugs, in orange- or mint-flavored syrups, might lead to overdoses or perhaps eventually encourage the use of illegal drugs (Cheung, Emslie, & Mayes, 2006; Rothenberger & Rothenberger, 2013; Seedat, 2014).

Finally, there is some evidence linking the use of antidepressant medication with an increased risk of suicide. Although the link has not been firmly established, the U.S. Federal Drug Administration issued a warning about the use of a class of antidepressants known as SSRIs in 2004. Some experts have urged that the use of these antidepressants in children and adolescents be banned completely (Bostwick, 2006; Sammons, 2009).

Although the use of antidepressant drugs to treat children is controversial, it is clear that childhood depression and other psychological disorders remain a significant problem for many children. Childhood psychological disorders must not be ignored. Not only are the disorders disruptive during childhood, but those who suffer from psychological problems as children are at risk for future disorders during adulthood (Bostwick, 2006; Gören, 2008; Sapyla & March, 2012).

As we'll see next, adults also need to pay attention to other, ongoing special needs that affect many school-age children.

Children with Special Needs

LO 9.4 **Describe the sorts of special needs that may become apparent in school-age children and how can they be met.**

Karen Avery was a happy-go-lucky child. Until she got to first grade. A reading assessment put Karen in the lowest reading group. Despite lots of one-on-one time with her teacher, Karen's reading did not improve. She couldn't recognize words she'd seen the day before or the day before that. Her retention problems soon became apparent across the curriculum. Karen's parents agreed to let the school give her some diagnostic tests. The results suggested Karen's brain had problems transferring information from her short-term (working) memory to her long-term memory. She was labeled with a learning disability. By law, she could now get the help she really needed.

Karen Avery joined millions of other children who are classified as having a *specific learning disorder*, one of several types of special needs that children can have. Although every child has different specific capabilities, children with *special needs* differ significantly from typical children in terms of physical attributes or learning abilities. Furthermore, their needs present major challenges for both care providers and teachers.

We turn now to the most prevalent exceptionalities that affect children of normal intelligence: sensory difficulties, learning disabilities, and attention-deficit disorders. We will consider the special needs of children who are significantly below and above average in intelligence later in the chapter.

SENSORY DIFFICULTIES: VISUAL, AUDITORY, AND SPEECH PROBLEMS. Anyone who has temporarily lost his or her eyeglasses or a contact lens has had a glimpse of how difficult even rudimentary, everyday tasks must be for those with sensory impairments. To function with less than typical vision, hearing, or speech can be a tremendous challenge.

visual impairment
a difficulty in seeing that may include blindness or partial sightedness

Visual impairment can be considered in both a legal and an educational sense. The definition of legal impairment is quite straightforward: *Blindness* is visual acuity of less than 20/200 after correction (meaning the inability to see even at 20 feet what a typical person can see at 200 feet), whereas *partial sightedness* is visual acuity of less than 20/70 after correction.

Even if individuals are not so severely impaired as to be legally blind, his or her visual problems may still seriously affect schoolwork. For one thing, the legal criterion pertains solely to distance vision, while most educational tasks require close-up vision. In addition, the legal definition does not consider abilities in the perception of color, depth, and light—all of which might influence a student's educational success. About one student in a thousand requires special education services relating to a visual impairment.

Most severe visual problems are identified fairly early, but it sometimes happens that an impairment goes undetected. Visual problems can also emerge gradually as children develop physiologically and changes occur in the visual apparatus of the eye. Parents and teachers need to be aware of the signals of visual problems in children. Frequent eye irritation (redness, sties, or infection), continual blinking and facial contortions when reading, holding reading material unusually close to the face, difficulty in writing, and frequent headaches, dizziness, or burning eyes are some of the signs of visual problems.

Auditory impairments can produce both academic and social difficulties, and they may lead to speech difficulties.

Auditory impairments can also cause academic problems, and they can produce social difficulties as well, since considerable peer interaction takes place through informal conversation. Hearing loss, which affects some 1 to 2 percent of the school-age population, is not simply a matter of not hearing enough. Rather, auditory problems can vary along a number of dimensions (Yoshinaga-Itano, 2003; Smith, Bale, & White, 2005).

auditory impairment
a special need that involves the loss of hearing or some aspect of hearing

In some cases of hearing loss, the child's hearing is impaired at only a limited range of frequencies, or pitches. For example, the loss may be great at pitches in the normal speech range yet quite minor in other frequencies, such as those of very high or low sounds. A child with this kind of loss may require different levels of amplification at different frequencies; a hearing aid that indiscriminately amplifies all frequencies equally may be ineffective because it will amplify the sounds the person can hear to an uncomfortable degree.

How a child adapts to this impairment depends on the age at which the hearing loss begins. If the loss of hearing occurs in infancy, the effects will probably be much more severe than if it occurs after the age of three. Children who have had little or no exposure to the sound of language are unable to understand or produce oral language themselves. On the other hand, loss of hearing after a child has learned language will not have serious consequences on subsequent linguistic development.

Severe and early loss of hearing is also associated with difficulties in abstract thinking. Because children with hearing impairment may have limited exposure to language, they may have more trouble mastering abstract concepts that can be understood fully only through the use of language than concrete concepts that can be illustrated visually. For example, it is difficult to explain the concept of "freedom" or "soul" without use of language (Marschark, Spencer, & Newsom, 2003; Meinzen-Derr et al., 2014).

Auditory difficulties are sometimes accompanied by speech impairments, one of the most public types of exceptionality: Every time the child speaks aloud, the impairment is obvious to listeners. The definition of **speech impairment** suggests that speech is impaired when it deviates so much from the speech of others that it calls attention to itself, interferes with communication, or produces maladjustment in the speaker. In other words, if a child's speech sounds impaired, it probably is. Speech impairments are present in around 3 to 5 percent of the school-age population (Bishop & Leonard, 2001).

speech impairment
speech that deviates so much from the speech of others that it calls attention to itself, interferes with communication, or produces maladjustment in the speaker

Childhood-onset fluency disorder, or ***stuttering***, involves a substantial disruption in the rhythm and fluency of speech and is the most common speech impairment. Despite a great deal of research, no specific cause has been identified. Occasional stuttering is not unusual in young children—and occasionally occurs in normal adults—but chronic stuttering can be a severe problem. Not only does stuttering hinder communication, but it can produce embarrassment and stress in children, who may become inhibited from conversing with others and speaking aloud in class (Altholz & Golensky, 2004; Sasisekaran, 2014).

childhood-onset fluency disorder (stuttering)
substantial disruption in the rhythm and fluency of speech; the most common speech impairment

Parents and teachers can adopt several strategies for dealing with stuttering. For starters, attention should not be drawn to the stuttering, and children should be given sufficient time to finish what they begin to say, no matter how protracted the statement becomes. It does not help stutterers to finish their sentences for them or otherwise correct their speech (Ryan, 2001; Beilby, Byrnes, & Young, 2012).

LEARNING DISABILITIES: DISCREPANCIES BETWEEN ACHIEVEMENT AND CAPACITY TO LEARN. Like Karen Avery, who was described at the beginning of this section, some 1 in 10 school-age children are labeled as having specific learning disorders. **Specific learning disorders** are characterized by difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. A somewhat ill-defined, grab-bag category, learning disorders are diagnosed when there is a discrepancy between children's actual academic performance and their apparent potential to learn (Lerner, 2002; Bos & Vaughn, 2005).

specific learning disorder
difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities

Such a broad definition encompasses a wide and extremely varied range of difficulties. For instance, some children suffer from *dyslexia*, a reading disability that can result in the misperception of letters during reading and writing, unusual difficulty in sounding out letters, confusion between left and right, and difficulties in spelling. Although dyslexia is not fully understood, one likely explanation for the disorder is a problem in the part of the brain responsible for breaking words into the sound elements that make up language (McGough, 2003; Lachmann et al., 2005; Summer, Connelly, & Barnett, 2014).

The causes of specific learning disorders in general are not well understood. Although they are generally attributed to some form of brain dysfunction, probably due to genetic factors, some experts suggest that they are produced by such environmental causes as poor early nutrition or allergies (Shaywitz, 2004).

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

> *Troy Dalton, age seven, exhausted his teacher. Unable to sit still, he roamed the classroom all day, distracting the other children. In reading group, he jumped up and down in his seat, dropping his book and knocking over the whiteboard. During read aloud, he ran around the room, humming noisily and shouting, "I'm a jet plane!" Once, he flung himself through the air, landing on another boy and breaking his arm. "He's the definition of perpetual motion," the teacher told Troy's mother (who looked pretty exhausted herself). The school finally decided to split Troy's day between the three second-grade classrooms. It was not a perfect solution, but it did allow his primary teacher to do some actual teaching.*

Seven-year-old Troy Dalton's high energy and low attention span are due to attention-deficit/hyperactivity disorder, which occurs in 3 to 5 percent of the school-age population. **Attention-deficit/hyperactivity disorder, or ADHD**, is marked by inattention, impulsiveness, a low tolerance for frustration, and generally a great deal of inappropriate activity. All children show such traits some of the time, but for those diagnosed with ADHD, such behavior is common and interferes with their home and school functioning (American Academy of Pediatrics, 2000b; Whalen et al., 2002; Van Neste et al., 2015).

attention-deficit/hyperactivity disorder, or ADHD
a learning disability marked by inattention, impulsiveness, a low tolerance for frustration, and generally a great deal of inappropriate activity

What are the most common signs of ADHD? It is often difficult to distinguish between children who simply have a high level of activity and those with ADHD. Some of the most common symptoms include:

- Persistent difficulty in finishing tasks, following instructions, and organizing work
- Inability to watch an entire television program
- Frequent interruption of others or excessive talking
- A tendency to jump into a task before hearing all the instructions
- Difficulty in waiting or remaining seated
- Fidgeting, squirming

Because there is no simple test to identify whether a child has ADHD, it is hard to know for sure how many children have the disorder. The Centers for Disease Control and Prevention put the proportion of children 3 to 17 years of age with ADHD at 9 percent, with boys being twice as likely to be diagnosed with the disorder as girls. Other estimates are lower. What is clear is that the incidence of diagnoses of ADHD has increased significantly over the past 20 years (see Figure 9-6). It is unclear whether the increase is due to an actual increase in the disorder or instead to an increase in its

labeling. In any case, only a trained clinician can make an accurate diagnosis following an extensive evaluation of the child and interviews with parents and teachers (Sax & Kautz, 2003; CDC, 2010).

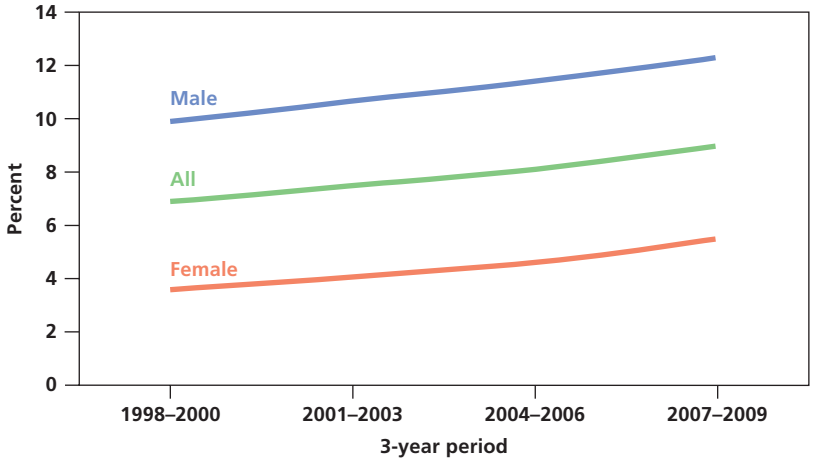
The causes of ADHD are not clear, although some research finds that it is related to a delay in neural development. Specifically, it may be that the thickening of the brain's cortex in children with ADHD lags three years behind that of children without the disorder (see Figure 9-7).

The treatment of children with ADHD has been a source of considerable controversy. Because it has been found that doses of Ritalin or Dexedrine (which, paradoxically, are stimulants) reduce activity levels in hyperactive children, many physicians routinely prescribe drug treatment (Arnsten, Berridge, & McCracken, 2009; Weissman et al., 2012).

Figure 9-6 Rising Diagnoses of ADHD

Over the last 20 years, diagnoses of ADHD have increased for boys and girls.

(**Source:** CDC/NCHS, Health Data Interactive and National Health Interview Survey. http://www.cdc.gov/nchs/data/databriefs/db70.htm)



Although in many cases such drugs are effective in increasing attention span and compliance, in some cases the side effects (such as irritability, reduced appetite, and depression) are considerable, and the long-term health consequences of this treatment are unclear. It is also true that though the drugs often help scholastic performance in the short run, the long-term evidence for continuing improvement is mixed. Some studies suggest that after a few years, children treated with drugs do not perform any better academically than untreated children with ADHD. Nonetheless, the drugs are being prescribed with increasing frequency (Mayes & Rafalovich, 2007; Rose, 2008; Prasad et al., 2013).

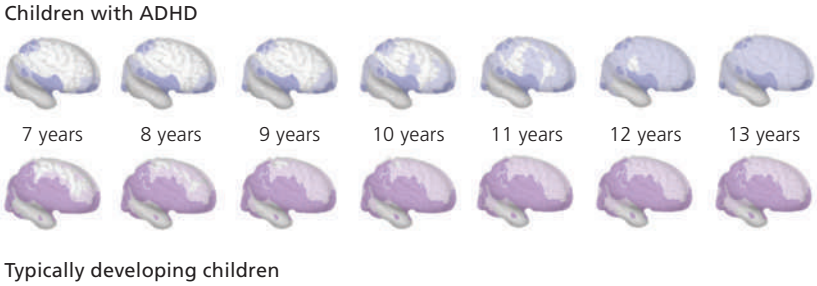
WATCH THIS VIDEO ON MYPSYCHLAB SPEAKING OUT: JIMMY: ADHD

In addition to the use of drugs for treating ADHD, behavior therapy is often employed. With behavior therapy, children are trained to control their impulses and achieve goals, primarily through the use of rewards (such as verbal praise) for desired behavior. In addition, teachers can increase the structure of classroom activities and use other class management techniques to help children with ADHD, who have great difficulty with unstructured tasks (Chronis, Jones, & Raggi, 2006; DuPaul & Weyandt, 2006). (Parents and teachers can receive support from the Children and Adults with Attention-Deficit/Hyperactivity Disorder organization at www.chadd.org. Also see the *From Research to Practice* box.)

Figure 9-7 The Brains of Children with ADHD

The brains of children with ADHD (in the top row) show less thickening of the cortex compared to the brains of typical children at the same age.

(**Source:** Shaw et al., 2007.)



From Research to Practice

Does Medicating Children with ADHD Produce Academic Benefits?

The common wisdom for a long time has been that drugs such as Ritalin or Adderall help children with attention-deficit/hyperactivity disorder—ADHD for short—to perform better at school. Research bore this notion out, establishing that these drugs help ADHD children with attention, concentration, and memory. But more recent research is casting a shadow of doubt by suggesting that it just may not matter much in the long run (Wang, 2013).

The discrepancy arises when researchers take a long view rather than focus on short-term outcomes. When one study examined educational outcomes over a period of 11 years for several thousand boys with ADHD, some who were medicated and some who were not, the medicated boys were actually performing worse in school than non-medicated with similar symptom profiles (Currie, Stabile, & Jones, 2014).

The puzzling question, of course, is why clear short-term benefits such as improved concentration and retention wouldn't translate into better grades. The problem may be that children with ADHD are no different from other children in terms of their motivations, discipline, and study skills. Using drugs to improve their focus doesn't guarantee that they will use that focus appropriately or consistently—and it may even work against them if, for example, they choose to focus on telephone conversations with friends or on a Netflix binge. It's clear that more research is needed to answer this question more definitively, and the answer is important: If we're going to be medicating young children with stimulants to overcome deficiencies in their academic performance, we need to be reasonably sure that the medications do in fact do that (Ilieva, Boland, & Farah, 2013).

Shared Writing Prompt

If you were creating a school program for students with special needs, what factors would you bear in mind when trying to help children achieve their full potential?

Module 9.1 Review

- During the middle childhood years, the body grows at a slow but steady pace that is influenced by both genetic and social factors. Adequate nutrition is important for physical, social, and cognitive development, but overnutrition may lead to obesity.
- Children substantially improve their gross and fine motor skills during the school years, with muscular coordination and manipulative skills advancing to near-adult levels.
- The incidence of asthma and childhood depression has increased significantly over the last several decades. The increasing independence and mobility of school-age children lead to new safety issues.
- Many school-age children have special needs, particularly in the areas of vision, hearing, and speech. Some also have learning disabilities. Attention-deficit/hyperactivity disorder, marked by attention, organization, and activity problems, affects between 3 and 5 percent of the school-age population. Treatment through the use of drugs is highly controversial.

Journal Writing Prompt

Applying Lifespan Development: What are some aspects of U.S. culture that may contribute to obesity among school-age children?

Intellectual Development

Jared's parents were delighted when he came home from kindergarten one day and explained that he had learned why the sky was blue. He talked about the earth's atmosphere—although he didn't pronounce the word correctly—and how tiny bits of moisture in the air reflected the sunlight. Although his explanation had rough edges (he couldn't quite grasp what the "atmosphere" was), he still had the general idea, and that, his parents felt, was quite an achievement for their five-year-old.

Fast-forward six years. Jared, now 11, had already spent an hour laboring over his evening's homework. After completing a two-page worksheet on multiplying and dividing fractions, he had begun work on his U.S. Constitution project. He was taking notes for his report, which would explain what political factions had been involved in the writing of the document and how the Constitution had been amended since its creation.

Jared is not alone in having made vast intellectual advances during middle childhood. During this period, children's cognitive abilities broaden, and they become increasingly able to understand and master complex skills. At the same time, though, their thinking is still not fully adultlike.

What are the advances, and the limitations, in thinking during childhood? Several perspectives explain what goes on cognitively during middle childhood.

Piagetian Approaches to Cognitive Development

LO 9.5 Summarize the Piagetian view of cognitive development in middle childhood.

Let's return for a moment to Jean Piaget's view of the preschooler, which we considered in Chapter 7. From Piaget's perspective, the preschooler thinks *preoperationally*. This type of thinking is largely egocentric, and preoperational children lack the ability to use *operations*—organized, formal, logical mental processes.

THE RISE OF CONCRETE OPERATIONAL THOUGHT. All this changes, according to Piaget, during the concrete operational period, which coincides with the school years. The **concrete operational stage**, which occurs between 7 and 12 years of age, is characterized by the active, and appropriate, use of logic.

concrete operational stage
the period of cognitive development between 7 and 12 years of age, which is characterized by the active, and appropriate, use of logic

Concrete operational thought involves applying *logical operations* to concrete problems. For instance, when children in the concrete operational stage are confronted with a conservation problem (such as determining whether a constant amount of liquid poured from one container to another container of a different shape stays the same), they use cognitive and logical processes to answer, no longer being influenced solely by appearance. They are able to reason correctly that since none of the liquid has been lost, the amount stays the same. Because they are less egocentric, they can take multiple aspects of a situation into account, an ability known as **decentering**. Jared, the sixth grader described at the beginning of this section, was using his decentering skills to consider the views of the different factions involved in creating the U.S. Constitution.

decentering
the ability to take multiple aspects of a situation into account

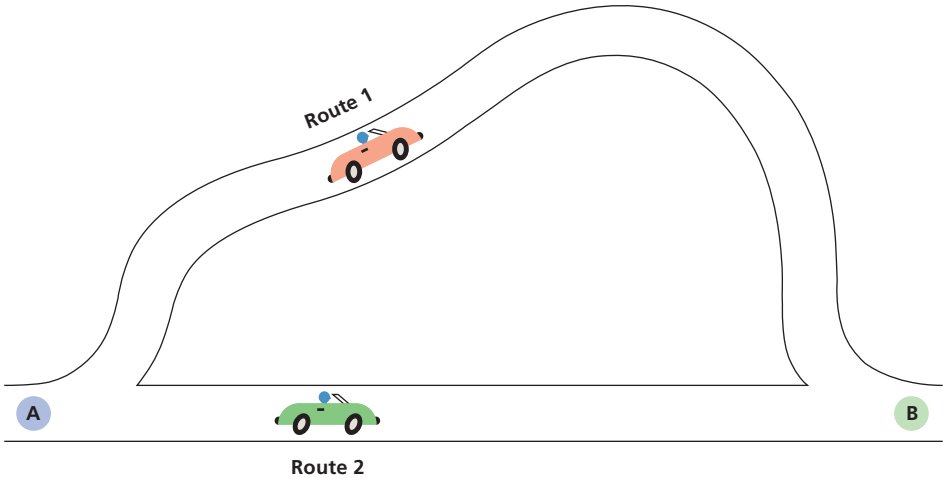
The shift from preoperational thought to concrete operational thought does not happen overnight, of course. During the two years before children move firmly into the concrete operational period, they shift back and forth between preoperational and concrete operational thinking. For instance, they typically pass through a period when they can answer conservation problems correctly but can't articulate why they did so. When asked to explain the reasoning behind their answers, they may respond with an unenlightening, "Because."

Once concrete operational thinking is fully engaged, however, children show several cognitive advances. For instance, they attain the concept of *reversibility*, which is the notion that processes transforming a stimulus can be reversed, returning the stimulus to its original form. Grasping reversibility permits children to understand that a ball of clay that has been squeezed into a long, snake-like rope can be returned to its original state. More abstractly, it allows school-age children to understand that if 3 + 5 equals 8, then 5 + 3 also equals 8—and, later during the period, that 8 - 3 equals 5.

Concrete operational thinking also permits children to understand such concepts as the relationship between time and speed. For instance, consider the problem shown in Figure 9-8 in which two cars start and finish at the same points in the same amount of time, but travel different routes. Children who are just entering the concrete operational period reason that the cars are traveling at the same speed. However, between the ages of 8 and 10, children begin to draw the right conclusion: that the car traveling the longer route must be moving faster if it arrives at the finish point at the same time as the car traveling the shorter route.

Figure 9-8 Routes to Conservation

After being told that the two cars traveling on routes 1 and 2 start and end their journeys in the same amount of time, children who are just entering the concrete operational period still reason that the cars are traveling at the same speed. Later, however, they reach the correct conclusion: that the car traveling the longer route must be moving at a higher speed if it starts and ends its journey at the same time as the car traveling the shorter route.



Despite the advances that occur during the concrete operational stage, children still experience one critical limitation in their thinking. They remain tied to concrete, physical reality. Furthermore, they are unable to understand truly abstract or hypothetical questions, or ones that involve formal logic.

PIAGET IN PERSPECTIVE: PIAGET WAS RIGHT, PIAGET WAS WRONG. As we learned in our prior consideration of Piaget's views in Chapters 5 and 7, researchers following in Piaget's footsteps have found much to cheer about—as well as much to criticize.

Piaget was a virtuoso observer of children, and his many books contain pages of brilliant, careful observations of children at work and play. Furthermore, his theories have powerful educational implications, and many schools employ principles derived from his views to guide the nature and presentation of instructional materials (Flavell, 1996; Siegler & Ellis, 1996; Brainerd, 2003).

In some ways, then, Piaget's approach was quite successful in describing cognitive development (Lourenco & Machado, 1996). At the same time, though, critics have voiced compelling and seemingly legitimate grievances about his approach. As we have noted before, many researchers argue that Piaget underestimated children's capabilities, in part because of the limited nature of the mini-experiments he conducted. When a broader array of experimental tasks is used, children show less consistency within stages than Piaget would predict (Bjorklund, 1997b; Bibacel, 2013).

Cognitive development makes substantial advances in middle childhood.

Furthermore, Piaget seems to have misjudged the age at which children's cognitive abilities emerge. As might be expected from our earlier discussions of Piaget's stages, increasing evidence suggests that children's capabilities emerge earlier than Piaget envisioned. Some children show evidence of a form of concrete operational thinking before the age of seven, the time at which Piaget suggested these abilities first appear.

Still, we cannot dismiss the Piagetian approach. Although some early cross-cultural research seemed to imply that

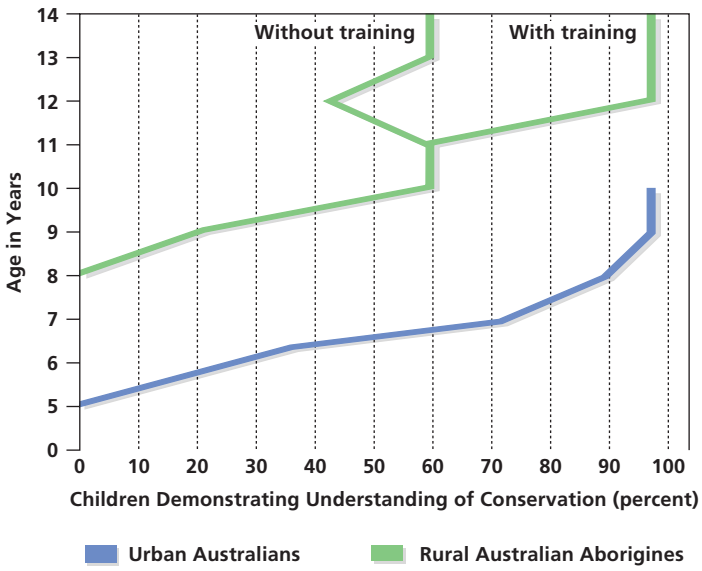
children in certain cultures never left the preoperational stage, failing to master conservation and to develop concrete operations, more recent research suggests otherwise. For instance, with proper training in conservation, children in non-Western cultures who do not conserve can readily learn to do so. For instance, in one study, urban Australian children—who develop concrete operations on the same timetable as Piaget suggested —were compared to rural Aborigine children, who typically do not demonstrate an understanding of conservation at the age of 14 (Dasen, Ngini, & Lavallee, 1979). When the rural Aborigine children were given training, they showed conservation skills similar to those of their urban counterparts, although with a time lag of around three years (see Figure 9-9).

Furthermore, when children are interviewed by researchers from their own culture, who know the language and customs of the culture well and who use reasoning tasks that are related to domains important to the culture, the children are considerably more likely to display concrete operational thinking (Nyiti, 1982; Jahoda, 1983). Ultimately, such research suggests that Piaget was right when he argued that concrete operations were universally achieved during middle childhood. Although school-age children in some cultures may differ from Westerners in the demonstration of certain cognitive skills, the most probable explanation of the difference is that the non-Western children have had different sorts of experiences from those that permit children in Western societies to perform well on Piagetian measures of conservation and concrete operations. The progress of cognitive development, then, cannot be understood without looking at the nature of a child's culture (Mishra, 1997; Lau, Lee, & Chiu, 2004; Maynard, 2008).

Figure 9-9 Conservation Training

Rural Australian Aborigine children trail their urban counterparts in the development of their understanding of conservation; with training, they later catch up. Without training, around half of 14-year-old Aborigines do not have an understanding of conservation. What can be concluded from the fact that training influences the understanding of conservation?

(**Source:** Based on Dasen, Ngini, & Lavallee, 1979.)



Information Processing in Middle Childhood

LO 9.6 **Explain how children develop cognitively in middle childhood according to information processing approaches.**

It is a significant achievement for first graders to learn basic math tasks, such as addition and subtraction of single-digit numbers, as well as the spelling of simple words such as *dog* and *run*. But by the time they reach the sixth grade, children are able to work with fractions and decimals, like the fractions worksheet that Jared, the boy in the example at the start of this section, completed for his sixth-grade homework. They can also spell such words as *exhibit* and *residence*.

memory
the process by which information is initially encoded, stored, and retrieved

According to *information processing approaches*, children become increasingly sophisticated in their handling of information. Like computers, they can process more data as the size of their memories increases and the "programs" they use to process information become increasingly sophisticated (Kuhn et al., 1995; Kail, 2003; Zelazo et al., 2003).

MEMORY. As we saw in Chapter 5, **memory** in the information processing model is the ability to encode, store, and retrieve information. For a child to remember a piece of information, the three processes must all function properly. Through *encoding*, the child initially records the information in a form usable to memory.

Although some early cross-cultural research seemed to imply that children in certain cultures never left the preoperational stage, more recent research suggests otherwise.

Children who were never taught that 5 + 6 = 11, or who didn't pay attention when they were exposed to this fact, will never be able to recall it. They never encoded the information in the first place.

But mere exposure to a fact is not enough; the information also has to be *stored*. In our example, the information that 5 + 6 = 11 must be placed and maintained in the memory system. Finally, proper functioning of memory requires that material that is stored in memory must be *retrieved*. Through retrieval, material in memory storage is located, brought into awareness, and used.

During middle childhood, the capacity of short-term memory (also referred to as *working memory*) improves significantly. For instance, children are increasingly able to hear a string of digits ("1-5-6-3-4") and then repeat the string in reverse order ("4-3-6-5-1"). At the start of the preschool period, they can remember and reverse only about two digits; by the beginning of adolescence, they can perform the task with as many as six digits. In addition, they use more sophisticated strategies for recalling information, which can be improved with training (Rose, 2008; Jack, Simcock, & Hayne, 2012; Jarrold & Hall, 2013).

Memory capacity may shed light on another issue in cognitive development. Some developmental psychologists suggest that the difficulty children experience in solving conservation problems during the preschool period may stem from memory limitations (Siegler & Richards, 1982). They argue that young children simply may not be able to recall all the necessary pieces of information that enter into the correct solution of conservation problems.

metamemory
an understanding about the processes that underlie memory, which emerges and improves during middle childhood

Metamemory, an understanding about the processes that underlie memory, also emerges and improves during middle childhood. By the time they enter first grade and their theory of mind becomes more sophisticated, children have a general notion of what memory is, and they are able to understand that some people have better memories than others (Cherney, 2003; Ghetti & Angelini, 2008; Jaswal & Dodson, 2009).

School-age children's understanding of memory becomes more sophisticated as they grow older and increasingly engage in *control strategies*—conscious, intentionally used tactics to improve cognitive processing. For instance, school-age children are aware that rehearsal, the repetition of information, is a useful strategy for improving memory, and they increasingly employ it over the course of middle childhood. Similarly, they progressively make more effort to organize material into coherent patterns, a strategy that permits them to recall it better. For instance, when faced with remembering a list including cups, knives, forks, and plates, older school-age children are more likely to group the items into coherent patterns—cups and plates, forks and knives—than children just entering the school-age years (Sang, Miao, & Deng, 2002; Dionne & Cadoret, 2013).

Similarly, children in middle childhood increasingly use *mnemonics* (pronounced "neh MON ix"), which are formal techniques for organizing information in a way that makes it more likely to be remembered. For instance, they may learn that the spaces on the music staff spell the word *FACE* or learn the rhyme "Thirty days hath September, April, June, and November …" to try to recall the number of days in each month (Bellezza, 2000; Carney & Levin, 2003; Sprenger, 2007).

IMPROVING MEMORY. Can children be trained to be more effective in the use of control strategies? Definitely. School-age children can be taught to use particular strategies, although such teaching is not a simple matter. For instance, children need to know not only how to use a memory strategy but also when and where to use it most effectively.

Take, for example, an innovative technique called the key word strategy, which can help students learn the vocabulary of a foreign language, the capitals of the states, or other information in which two sets of words or labels are paired. In the *key word strategy*, one word is paired with another that sounds like it (Wyra, Lawson, & Hungi, 2007). For instance, in learning foreign language vocabulary, a foreign word is paired with a common English word that has a similar sound. The English word is the key word. Thus, to learn the Spanish

word for duck (*pato*, pronounced *pot-o*), the key word might be "pot"; for the Spanish word for horse (*caballo*, pronounced *cob-eye-yo*), the key word might be "eye." Once the key word is chosen, children then form a mental image of the two words interacting with one another. For instance, a student might use an image of a duck taking a bath in a pot to remember the word *pato*, or a horse with bulging eyes to remember the word *caballo*.

Vygotsky's Approach to Cognitive Development and Classroom Instruction

LO 9.7 Summarize Vygotsky's interpretation of cognitive development during middle childhood.

Learning environments can encourage children to learn these strategies as well. Recall from Chapter 7 that Russian developmentalist Lev Vygotsky proposed that cognitive advances occur through exposure to information within a child's *zone of proximal development*, or ZPD. The ZPD is the level at which a child can almost, but not quite, understand or perform a task.

Vygotsky's approach has been particularly influential in the development of several classroom practices based on the proposition that children should actively participate in their educational experiences (e.g., Holzman, 1997). Consequently, classrooms are seen as places where children should have the opportunity to experiment and try out new activities (Vygotsky, 1926/1997; Gredler & Shields, 2008; Gredler, 2012).

From *an educator's* perspective

Suggest how a teacher might use Vygotsky's approach to teach 10-year-olds about colonial America.

According to Vygotsky, education should focus on activities that involve interaction with others. Both child–adult and child–child interactions can provide the potential for cognitive growth. The nature of the interactions must be carefully structured to fall within each individual child's zone of proximal development.

Several current and noteworthy educational innovations have borrowed heavily from Vygotsky's work. For example, *cooperative learning*, in which children work together in groups to achieve a common goal, incorporates several aspects of Vygotsky's theory. Students working in cooperative groups benefit from the insights of others, and if they get off onto the wrong track, they may be brought back to the correct course by others in their group. On the other hand, not every peer is equally helpful to members of a cooperative learning group: As Vygotsky's approach would imply, individual children benefit most when at least some of the other members of the group are more competent at the task and can act as experts (DeLisi, 2006; Slavin, 2013; Gillies, 2014).

Reciprocal teaching is another educational practice that reflects Vygotsky's approach to cognitive development. *Reciprocal teaching* is a technique to teach reading comprehension strategies. Students are taught to skim the content of a passage, raise questions about its central point, summarize the passage, and finally predict what will happen next. A key to this technique is its reciprocal nature, its emphasis on giving students a chance to take on the role of teacher. In the beginning, teachers lead students through the comprehension strategies. Gradually, students progress through their zones of proximal development, taking more and more control over use of the strategies, until the students are able to take on a teaching role. The method has shown impressive success in raising reading comprehension levels, particularly for students experiencing reading difficulties (Greenway, 2002; Takala, 2006; Spörer, Brunstein, & Kieschke, 2009).

Students working in cooperative groups benefit from the insights of others.

Language Development: What Words Mean

LO 9.8 Describe how language develops during middle childhood.

If you listen to what school-age children say to one another, their speech, at least at first hearing, sounds not too different from that of adults. However, the apparent similarity is deceiving. The linguistic sophistication of children—particularly at the start of the school-age period—still requires refinement to reach adult levels of expertise.

MASTERING THE MECHANICS OF LANGUAGE. Vocabulary continues to increase during the school years at a fairly rapid clip. For instance, the average six-year-old has a vocabulary of 8,000 to 14,000 words, whereas the vocabulary grows by another 5,000 words between the ages of 9 and 11.

School-age children's mastery of grammar also improves. For instance, the use of the passive voice is rare during the early school-age years (as in "The dog was walked by Jon," compared with the active-voice "Jon walked the dog"). Six- and seven-year-olds only infrequently use conditional sentences, such as "If Sarah will set the table, I will wash the dishes." However, over the course of middle childhood, the use of both passive voice and conditional sentences increases. In addition, children's understanding of *syntax*, the rules that indicate how words and phrases can be combined to form sentences, grows during middle childhood.

By the time they reach first grade, most children pronounce words quite accurately. However, certain *phonemes*, units of sound, remain troublesome. For instance, the ability to pronounce *j, v, th*, and *zh* sounds develops later than the ability to pronounce other phonemes.

School-age children also may have difficulty decoding sentences when the meaning depends on *intonation*, or tone of voice. For example, consider the sentence, "George gave a book to David and he gave one to Bill." If the word *he* is emphasized, the meaning is "George gave a book to David and David gave a different book to Bill." But if the intonation emphasizes the word *and*, then the meaning changes to "George gave a book to David and George also gave a book to Bill." School-age children cannot easily sort out subtleties such as these (Wells, Peppé, & Goulandris, 2004; Bosco et al., 2013).

In addition to language skills, conversational skills also develop during middle childhood. Children become more competent in their use of *pragmatics*, the rules governing the use of language to communicate in a given social setting.

For example, although children are aware of the rules of conversational turn-taking at the start of the early childhood period, their use of these rules is sometimes primitive. Consider the following conversation between six-year-olds Yonnie and Max:

YONNIE: My dad drives a FedEx truck.
MAX: My sister's name is Molly.
YONNIE: He gets up really early in the morning.
MAX: She wet her bed last night.

Later, however, conversations show more give-and-take, with the second child actually responding to the comments of the first. For instance, this conversation between 11-year-olds Mia and Josh reflects a more sophisticated mastery of pragmatics:

MIA: I don't know what to get Claire for her birthday.
JOSH: I'm getting her earrings.
MAX: She already has a lot of jewelry.
JOSH: I don't think she has that much.

METALINGUISTIC AWARENESS. One of the most significant developments in middle childhood is children's increasing understanding of their own use of language, or **metalinguistic awareness**. By the time children are five or six, they understand that language is governed by a set of rules. Whereas in the early years they learn and comprehend these rules implicitly, during middle childhood children come to understand them more explicitly (Benelli et al., 2006; Saiegh-Haddad, 2007).

metalinguistic awareness
an understanding of one's own use of language

Metalinguistic awareness helps children achieve comprehension when information is fuzzy or incomplete. For instance, when preschoolers are given ambiguous or unclear information, such as directions for how to play a complicated game, they rarely ask for clarification, and they tend to blame themselves if they do not understand. By the time they reach the age of seven or eight, children realize that miscommunication may be due to factors attributable not only to themselves but to the person communicating with them as well. Consequently, school-age children are more likely to ask for clarifications of information that is unclear to them (Apperly & Robinson, 2002).

HOW LANGUAGE PROMOTES SELF-CONTROL. The growing sophistication of their language helps school-age children control and regulate their behavior. For instance, in one experiment, children were told that they could have one marshmallow treat if they chose to eat one immediately, but two treats if they waited. Most of the children, who ranged in age from four to eight, chose to wait, but the strategies they used while waiting differed significantly.

The four-year-olds often chose to look at the marshmallows while waiting, a strategy that was not terribly effective. In contrast, six- and eight-year-olds used language to help them overcome temptation, although in different ways. The six-year-olds spoke and sang to themselves, reminding themselves that if they waited they would get more treats in the end. The eight-year-olds focused on aspects of the marshmallows that were not related to taste, such as their appearance, which helped them to wait.

In short, children used "self-talk" to help regulate their own behavior. Furthermore, the effectiveness of their self-control grew as their linguistic capabilities increased.

BILINGUALISM: SPEAKING IN MANY TONGUES

> *John Dewey Elementary is a school known for its progressive and democratic attitudes. On the campus of a large university, it boasts a staff of classroom aides who in sum speak fifteen different languages, including Hindi and Hausa. The challenge is there are more than 30 languages spoken by the students.*

From the smallest towns to the biggest cities, the voices with which children speak are changing. Nearly one in five people in the United States speaks a language other than English at home, and that percentage is growing. **Bilingualism**—the use of more than one language—is growing increasingly common (Graddol, 2004; Hoff & Core, 2013; see Figure 9-10).

bilingualism
the use of more than one language

Children who enter school with little or no English proficiency must learn both the standard curriculum and the language in which that curriculum is taught. One approach to educating non-English speakers is *bilingual education*, in which children are initially taught in their native language, while at the same time learning English. With bilingual instruction, students are able to develop a strong foundation in basic subject areas using their native language. The ultimate goal of most bilingual education programs is to gradually shift instruction into English.

An alternative approach is to immerse students in English, teaching solely in that language. To proponents of this approach, initially teaching students in a language other than English hinders students' efforts to learn English and slows their integration into society.

The two quite different approaches have been highly politicized, with some politicians arguing in favor of "English-only" laws, while others urge school systems to respect the challenges faced by nonnative speakers by offering some instruction in their native language. Still, the psychological research is clear in suggesting that knowing more than one language offers several cognitive advantages. Because they have a wider range of linguistic possibilities to choose from as they assess a situation, speakers of two languages show greater cognitive flexibility. They can solve problems with greater creativity and versatility. Furthermore, learning in one's native tongue is associated with higher self-esteem in minority students.

Figure 9-10 The Diversity of Languages Other Than English Spoken in the United States

(**Source:** Tagalog in California, Cherokee in Arkansas. What language does your state speak? By Ben Blatt, *May 23, 2014, Slate. http://www.slate.com/articles/arts/culturebox/2014/05/language_map_what_s_the_most_popular_language_in_your_state.html)*

Module 9.2 Review

- According to Piaget, school-age children are in the concrete operational stage, characterized by the application of logical processes to concrete problems.
- Information processing approaches focus on quantitative improvements in memory and in the sophistication of the mental programs that school-age children use. The memory processes—encoding, storage, and retrieval—come under increasing control during the school years, and the development of metamemory improves cognitive processing and memorization.
- According to Vygotsky's approach, children in the school years should have the opportunity to experiment and participate actively with their colleagues in their educational experiences.
- Language development is characterized by improvements in vocabulary, syntax, and pragmatics; by the growth of metalinguistic awareness; and by the use of language as a self-control device. Bilingualism can produce improvements in cognitive flexibility and metalinguistic awareness.

Journal Writing Prompt

Applying Lifespan Development: What are some of the challenges and advantages of teaching children in their native languages?

Schooling: The Three Rs (and More) of Middle Childhood

As the eyes of the six other children in his reading group turned to him, Glenn shifted uneasily in his chair. Reading had never come easily to him, and he always felt anxious when it was his turn to read aloud. But as his teacher nodded in encouragement, he plunged in, hesitantly at first, then gaining momentum as he read the story about a mother's first day on a new job. He found that he could read the passage quite nicely, and he felt a surge of happiness and pride at his accomplishment. When he was done, he broke into a broad smile as his teacher said simply, "Well done, Glenn."

Small moments such as these, repeated over and over, make—or break—a child's educational experience. Schooling marks a time when society formally attempts to transfer to new generations its accumulated body of knowledge, beliefs, values, and wisdom. The success with which this transfer is managed determines, in a very real sense, the future fortunes of the world.

In the United States, as in most developed countries, a primary school education is both a universal right and a legal requirement. Virtually all children are provided with a free education through the twelfth grade.

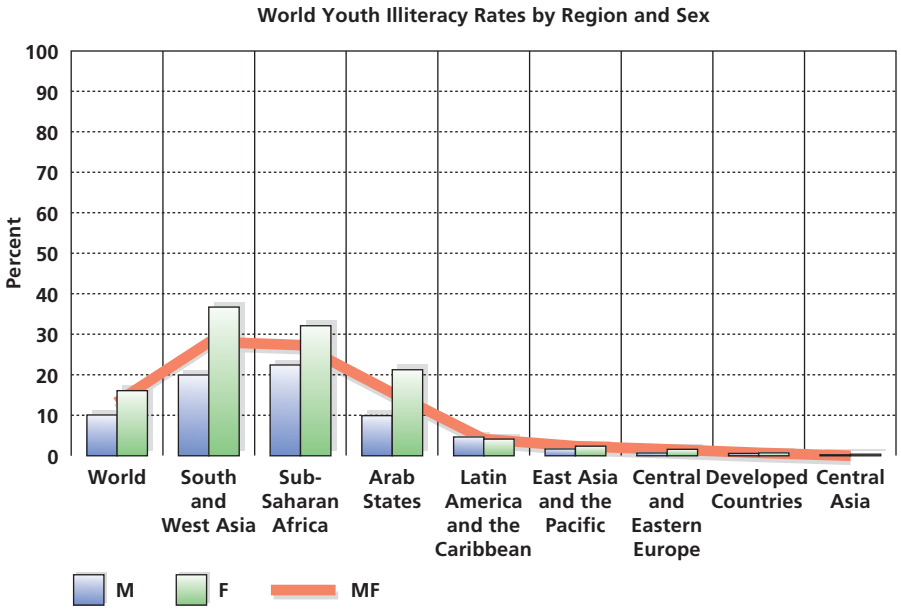
Children in other parts of the world are not so fortunate. More than 160 million of the world's children do not have access to even a primary school education. An additional 100 million children do not progress beyond a level comparable to our elementary school education, and overall close to a billion individuals (two-thirds of them women) are illiterate throughout their lives (see Figure 9-11; International Literacy Institute, 2001).

WATCH THIS VIDEO ON MYPSYCHLAB SCHOOL AND EDUCATION IN MIDDLE CHILDHOOD ACROSS CULTURES

Figure 9-11 The Plague of Illiteracy

Illiteracy remains a significant worldwide problem, particularly for women. Across the world, close to a billion people are illiterate throughout their lives.

(**Source:** UNESCO, 2006.)



In almost all developing countries, fewer females than males receive formal education, a discrepancy found at every level of schooling. Even in developed countries, women lag behind men in their exposure to science and technological topics. These differences reflect widespread and deeply held cultural and parental biases that favor males over females. Educational levels in the United States are more nearly equal between men and women. Especially in the early years of school, boys and girls share equal access to educational opportunities.

Reading: Learning to Decode the Meaning behind Words

LO 9.9 Explain how children learn to read.

There is no other task that is more fundamental to schooling than learning to read. Reading involves a significant number of skills, from low-level cognitive skills (the identification of single letters and associating letters with sounds) to higher-level skills (matching written words with meanings located in long-term memory and using context and background knowledge to determine the meaning of a sentence).

READING STAGES. The development of reading skills generally occurs in several broad and frequently overlapping stages (Challe, 1979, 1992; see Table 9-1). In *Stage 0*, which lasts from birth to the start of first grade, children learn the essential prerequisites for reading, including identification of the letters in the alphabet, sometimes writing their names, and reading a few very familiar words (such as their own names or *stop* on a stop sign).

Stage 1 brings the first real type of reading, but it largely involves *phonological recoding* skill. At this stage, which usually encompasses the first and second grade, children can sound out words by blending the letters together. Children also complete the job of learning the names of letters and the sounds that go with them.

In *Stage 2*, typically around second and third grades, children learn to read aloud with fluency. However, they do not attach much meaning to the words because the effort involved in simply sounding out words is usually so great that relatively few cognitive resources are left over to process the meaning of the words.

The next period, *Stage 3*, extends from fourth to eighth grade. Reading becomes a means to an end—in particular, a way to learn. Whereas earlier reading was an accomplishment in and of itself, by this point children use reading to learn about the world. However, even at this age, understanding gained from reading is not complete. For instance, one limitation children have at this stage is that they are able to comprehend information only when it is presented from a single perspective.

In the final period, *Stage 4*, children are able to read and process information that reflects multiple points of view. This ability, which begins during the transition into high school, permits children to develop a far more sophisticated understanding of material. This explains why great works of literature are not read at an earlier stage of education. It is not so much that younger children do not have the vocabulary to understand such works (although this is partially true); it is that they lack the ability to understand the multiple points of view that sophisticated literature invariably presents.

HOW SHOULD WE TEACH READING? Educators have long been engaged in a debate regarding the most effective means of teaching reading. At the heart of this debate is a dis-

Table 9-1 Development of Reading Skills

Stage	Age	Key Characteristics
Stage 0	Birth to start of first grade	Learns prerequisites for reading, such as identification of the letters
Stage 1	First and second grades	Learns phonological recoding skills, starts reading
Stage 2	Second and third grades	Reads aloud fluently, but without much meaning
Stage 3	Fourth to eighth grades	Uses reading as a means for learning
Stage 4	Eighth grade and beyond	Understands reading in terms of reflecting multiple points of view

(**Source:** Based on Challe, 1979.)

agreement about the nature of the mechanisms by which information is processed during reading. According to proponents of *code-based approaches to reading*, reading should be taught by presenting the basic skills that underlie reading. Code-based approaches emphasize the components of reading, such as the sounds of letters and their combinations—phonics—and how letters and sounds are combined to make words. They suggest that reading consists of processing the individual components of words, combining them into words, and then using the words to derive the meaning of written sentences and passages (Jimenez & Guzman, 2003; Gray et al., 2007; Hagan-Burke, 2013).

In contrast, some educators argue that reading is taught most successfully by using a whole-language approach. In *whole-language approaches to reading*, reading is viewed as a natural process, similar to the acquisition of oral language. According to this view, children should learn to read through exposure to complete writing—sentences, stories, poems, lists, charts, and other examples of actual uses of writing. Instead of being taught to sound out words, children are encouraged to make guesses about the meaning of words based on the context in which they appear. Through such a trial-and-error approach, children come to learn whole words and phrases at a time, gradually becoming proficient readers (Shaw, 2003; Sousa, 2005; Donat, 2006).

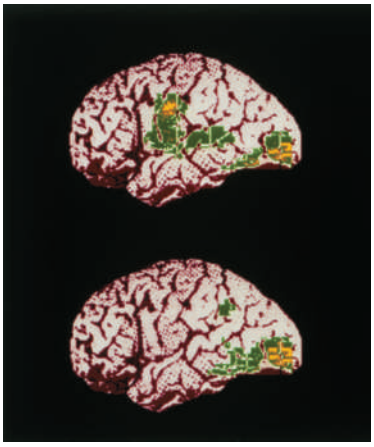
A growing body of research suggests that the code-based approach to reading instruction is superior to whole-language approaches. For example, one study found not only that a group of children tutored in phonics for a year improved substantially in their reading, compared to a group of good readers, but also that the neural pathways involved in reading became closer to that of good readers (Shaywitz et al., 2004; Shapiro & Solity, 2008; Vaish, 2014).

Based on research such as this, the National Reading Panel and National Research Council now support reading instruction using code-based approaches. Their position signals that an end may be near to the debate over which approach to teaching reading is most effective (Rayner et al., 2002; Brady, 2011).

Whatever approach is used to teach reading, reading produces significant changes in the wiring of the brain. It boosts the organization of the visual cortex of the brain and it improves the processing of spoken language (see Figure 9-12; Dejaeme et al., 2010).

Figure 9-12

The act of reading involves activation of significant areas of the brain, as these scans illustrate. In the top scan, an individual is reading aloud; in the bottom scan, the person is reading silently.



Educational Trends: Beyond the Three Rs

LO 9.10 Summarize what schools teach beyond the basics in middle childhood.

Schooling in the twenty-first century is very different from what it was as recently as a decade ago. U.S. schools are experiencing a return to the educational fundamentals embodied in the traditional three Rs (reading, writing, and arithmetic). The focus on the fundamentals marks a departure from educational trends of prior decades when the emphasis was on social well-being and on allowing students to choose study topics on the basis of their interests instead of following a set curriculum (Schemo, 2003; Yinger, 2004).

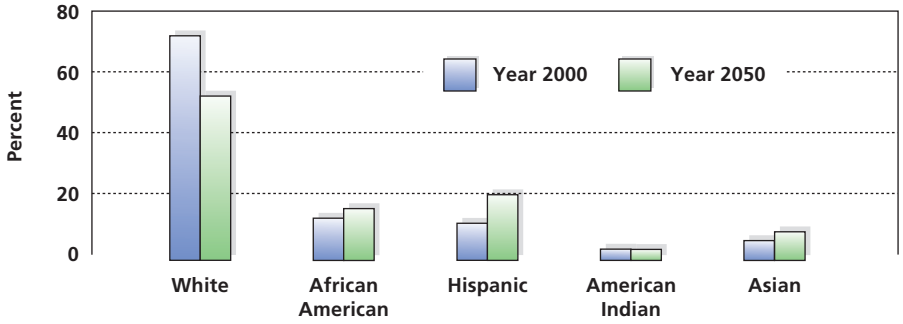
Elementary school classrooms today also stress individual accountability, both for teachers and students. Teachers are more likely to be held responsible for their students' learning, and both students and teachers are more likely to be required to take tests, developed at the state or national level, to assess their competence. Consequently, pressures on students to succeed have grown (McDonnell, 2004).

As the U.S. population has become more diverse, elementary schools have also paid increased attention to issues involving student diversity and multiculturalism. And with good reason: Cultural, as well as language, differences affect students socially and educationally. The demographic makeup of students in the United States is undergoing an extraordinary shift. For instance, the proportion of Hispanics will in all likelihood more than double in the next 50 years. Moreover, by the year 2050, non-Hispanic Caucasians will likely become a minority of the total population of the United States (U.S. Bureau of Census, 2001; see Figure 9-13). Consequently, educators have been increasingly serious about multicultural concerns. The following *Developmental Diversity and Your Life* feature, on multicultural education, discusses how the goals for educating students from different cultures have changed significantly over the years and are still being debated today (Brock et al., 2007).

Figure 9-13 The Changing Face of America

Current projections of the population makeup of the United States show that by the year 2050, the proportion of non-Hispanic whites will decline as the proportion of minority group members increases. What will be some of the impacts of changing demographics on social workers?

(**Source:** U.S. Census Bureau, 2000.)



multicultural education
a form of education in which the goal is to help minority students develop competence in the culture of the majority group while maintaining positive group identities that build on their original cultures

Developmental Diversity and Your Life

Multicultural Education

It has always been the case that classrooms in the United States have been populated by individuals from a broad range of backgrounds and experiences. Yet it is only recently that variations in student backgrounds have been viewed as one of the major challenges—and opportunities—that educators face.

The diversity of background and experience in the classroom relates to a fundamental objective of education, which is to provide a formal mechanism to transmit the information a society deems important. As the famous anthropologist Margaret Mead (1942, p. 633) once said, "In its broadest sense, education is the cultural process, the way in which each newborn human infant, born with a potentiality for learning greater than that of any other mammal, is transformed into a full member of a specific human society, sharing with the other members of a specific human culture."

Culture, then, can be thought of as a set of behaviors, beliefs, values, and expectations shared by members of a particular society. But although culture is often thought of in a relatively broad context (as in "Western culture" or "Asian culture"), it is also possible to focus on particular *subcultural* groups within a larger, more encompassing culture. For example, we can consider particular racial, ethnic, religious, socioeconomic, or even gender groups in the United States as manifesting characteristics of a subculture.

Pupils and teachers exposed to a diverse group could better understand the world and gain a greater sensitivity to the values and needs of others. What are some ways of developing greater sensitivity in the classroom?

Membership in a cultural or subcultural group might be of only passing interest to educators were it not for the fact that students' cultural backgrounds have a substantial impact on the way that they—and their peers—are educated. In recent years, a considerable amount of thought has gone into establishing **multicultural education**, a form of education in which the goal is to help minority students develop competence in the culture of the majority group while maintaining positive group identities that build on their original cultures (Nieto, 2005).

cultural assimilation model
a model in which the goal of education is to assimilate individual cultural identities into a unique, unified American culture

CULTURAL ASSIMILATION OR PLURALISTIC SOCIETY? Multicultural education developed in part as a reaction to a **cultural assimilation model** in which the goal of education was to assimilate individual cultural identities into a unique, unified American culture. In practical terms this meant, for example, that non-English-speaking students were discouraged from speaking their native tongues and were totally immersed in English.

In the early 1970s, however, educators and members of minority groups began to suggest that the cultural assimilation model ought to be replaced by a **pluralistic society model**. According to this conception, American society is made up of diverse, coequal cultural groups that should preserve their individual cultural features.

pluralistic society model
the concept that American society is made up of diverse, coequal cultural groups that should preserve their individual cultural features

The pluralistic society model grew in part from the belief that teachers, by emphasizing the dominant culture and discouraging students who were nonnative speakers from using their native tongues, had the effect of devaluing minority subcultural heritages and lowering those students' self-esteem. Instructional materials, such as readers and history lessons, inevitably feature culture-specific events and understandings; children who never saw examples representing their own cultural heritage might never be exposed to important aspects of their backgrounds. For example, English-language texts rarely present some of the great themes that appear throughout Spanish literature and history (such as the search for the Fountain of Youth and the Don Juan legend). Hispanic students immersed in such texts might never come to understand important components of their own heritage.

Ultimately, educators began to argue that the presence of students representing diverse cultures enriched and broadened the educational experience of all students. Pupils and teachers exposed to people from different backgrounds could better understand the world and gain greater sensitivity to the values and needs of others (Zirkel & Cantor, 2004; Levin et al., 2012; Thijs & Verkuyten, 2013).

FOSTERING A BICULTURAL IDENTITY. Today, most educators agree that minority children should be encouraged to develop a **bicultural identity**. They recommend that school systems encourage children to maintain their original cultural identities while they integrate themselves into the dominant culture. This view suggests that an individual can live as a member of two cultures, with two cultural identities, without having to choose one over the other (Lu, 2001; Oyserman et al., 2003; Vyas, 2004; Collins, 2012).

bicultural identity
maintaining one's original cultural identity while integrating oneself into the dominant culture

From *an educator's* perspective

Should one goal of society be to foster cultural assimilation in children from other cultures? Why or why not?

The best way to achieve this goal of biculturalism is not clear. Consider, for example, children who enter a school speaking only Spanish. The traditional "melting-pot" technique would be to immerse the children in classes taught in English while providing a crash course in English-language instruction (and little else) until the children demonstrate a suitable level of proficiency. Unfortunately, the traditional approach has a considerable drawback: Until the children master English, they fall further and further behind their peers who entered school already knowing English.

More contemporary approaches emphasize a bicultural strategy in which children are encouraged to maintain simultaneous membership in more than one culture. In the case of Spanish-speaking children, for example, instruction begins in the child's native language and shifts as rapidly as possible to include English. At the same time, the school conducts a program of multicultural education for all students, in which teachers present material on the cultural backgrounds and traditions of all the students in the school. Such instruction is designed to enhance the self-image of speakers from both majority and minority cultures (Bracey, Bamaca, & Umana-Taylor, 2004; Fowers & Davidov, 2006; Mok & Morris, 2012).

Although most educational experts favor bicultural approaches, the general public does not always agree. For instance, the national "English-only" movement mentioned earlier has as one of its goals the prohibition of school instruction in any language other than English. Whether such a perspective will prevail remains to be seen.

Intelligence: Determining Individual Strengths

LO 9.11 Describe how intelligence is measured and what controversies arise from measuring it.

"Why should you tell the truth?" "How far is Los Angeles from New York?" "A table is made of wood; a window of _____."

As 10-year-old Hyacinth sat hunched over her desk, trying to answer a long series of questions like these, she tried to guess the point of the test she was taking in her fifth-grade classroom. Clearly, the test didn't cover material that her teacher, Ms. White-Johnston, had talked about in class.

"What number comes next in this series: 1, 3, 7, 15, 31, ____?"

As she continued to work her way through the questions, she gave up trying to guess the rationale for the test. She'd leave that to her teacher, she sighed to herself. Rather than attempting to figure out what it all meant, she simply tried to do her best on the individual test items.

Hyacinth was taking an intelligence test. She might be surprised to learn that she was not alone in questioning the meaning and import of the items on the test. Intelligence test items are painstakingly prepared, and intelligence tests show a strong relationship to success in school (for reasons we'll soon discuss). Many developmentalists, however, would admit to harboring their own doubts as to whether questions such as those on Hyacinth's test are entirely appropriate to the task of assessing intelligence.

Understanding just what is meant by the concept of intelligence has proven to be a major challenge for researchers interested in delineating what separates intelligent from unintelligent behavior. Although nonexperts have their own conceptions of intelligence (one survey found, for instance, that laypersons believe that intelligence consists of three components: problem-solving ability, verbal ability, and social competence), it has been more difficult for experts to concur (Sternberg et al., 1981; Howe, 1997). Still, a general definition of intelligence is possible: **Intelligence** is the capacity to understand the world, think with rationality, and use resources effectively when faced with challenges (Wechsler, 1975).

intelligence
the capacity to understand the world, think with rationality, and use resources effectively when faced with challenges

Part of the difficulty in defining intelligence stems from the many—and sometimes unsatisfactory—paths that have been followed over the years in the quest to distinguish more intelligent people from less intelligent ones. To understand how researchers have approached the task of assessing intelligence by devising *intelligence tests*, we need to consider some of the historical milestones in the area of intelligence.

INTELLIGENCE BENCHMARKS: DIFFERENTIATING THE INTELLIGENT FROM THE UNINTELLIGENT. The Paris school system was faced with a problem at the turn of the twentieth century: A significant number of children were not benefiting from regular instruction. Unfortunately, these children—many of whom we would now call intellectually disabled—were generally not identified early enough to shift them to special classes. The French minister of instruction approached psychologist Alfred Binet with this problem and asked him to devise a technique for the early identification of students who might benefit from instruction outside the regular classroom.

Binet's Test. Binet tackled his task in a thoroughly practical manner. His years of observing school-age children suggested to him that previous efforts to distinguish intelligent from unintelligent students—some of which were based on reaction time or keenness of sight—were off the mark. Instead, he launched a trial-and-error process in which items and tasks were administered to students who had been previously identified by teachers as being either "bright" or "dull." Tasks that the bright students completed correctly and the dull students failed to complete correctly were retained for the test. Tasks that did not discriminate between the two groups were discarded. The end result of this process was a test that reliably distinguished students who had previously been identified as fast or slow learners.

Binet's pioneering efforts in intelligence testing left three important legacies. The first was his pragmatic approach to the construction of intelligence tests. Binet did not have theoretical preconceptions about what intelligence was. Instead, he used a trial-and-error approach to psychological measurement that continues to serve as the predominant approach to test construction today. His definition of intelligence as *that which his test measured* has been adopted by many modern researchers, and it is particularly popular among test developers who respect the widespread utility of intelligence tests but wish to avoid arguments about the underlying nature of intelligence.

Binet's legacy extends to his linking of intelligence and school success. Binet's procedure for constructing an intelligence test ensured that intelligence—defined as performance on the test—and school success would be virtually one and the same. Thus, Binet's intelligence test, and today's tests that follow in Binet's footsteps, have become reasonable indicators of the degree to which students possess attributes that contribute to successful school performance. On the other hand, they do not provide useful information regarding a vast number of other attributes that are largely unrelated to academic proficiency, such as social skills or personality characteristics.

Finally, Binet developed a procedure of linking each intelligence test score with a **mental age**, the age of the children taking the test who, on average, achieved that score. For example, if a six-year-old girl received a score of 30 on the test, and this was the average score received by 10-year-olds, her mental age would be considered 10 years. Similarly, a 15-year-old boy who scored a 90 on the test—thereby matching the mean score for 15-year-olds—would be assigned a mental age of 15 years (Wasserman & Tulsky, 2005).

mental age
the typical intelligence level found for people at a given chronological age

Although assigning a mental age to students provides an indication of whether or not they are performing at the same level as their peers, it does not permit adequate comparisons between students who each have different **chronological (or physical) age**. By using mental age alone, for instance, it would be assumed that a 15-year-old responding with a mental age of 17 years would be as bright as a six-year-old responding with a mental age of 8 years, when actually the six-year-old would be showing a much greater *relative* degree of brightness.

chronological (or physical) age
the actual age of the child taking the intelligence test

A solution to this problem comes in the form of the **intelligence quotient, or IQ score**, a measure that takes into account a student's mental and chronological age. The traditional method of calculating an IQ score uses the following formula, in which MA stands for mental age and CA for chronological age:

intelligence quotient (or IQ score)
a measure of intelligence that takes into account a student's mental *and* chronological age

$$\text{IQ score} = \frac{\text{MA}}{\text{CA}} \times 100$$

As a bit of trial and error with this formula demonstrates, people whose mental age (MA) is equal to their chronological age (CA) will always have an IQ of 100. Furthermore, if the chronological age exceeds the mental age—implying below-average intelligence—the score will be below 100; and if the chronological age is lower than the mental age—suggesting above-average intelligence—the score will be above 100.

Using this formula, we can return to our earlier example of a 15-year-old who scores at a 17-year-old mental age. This student's IQ is $\frac{17}{15} \times 100$ or 113. In comparison, the IQ of a six-year-old scoring at a mental age of 8 is $\frac{8}{6} \times 100$ or 133—a higher IQ score than the 15-year-old's.

IQ scores today are calculated in a more mathematically sophisticated manner and are known as *deviation IQ scores*. The average deviation IQ score remains set at 100, but tests are now devised so that the degree of deviation from this score permits the calculation of the proportion of people who have similar scores. For instance, approximately two-thirds of all people fall within 15 points of the average score of 100, achieving scores between 85 and 115. As scores rise or fall beyond this range, the percentage of people in the same score category drops significantly.

Stanford-Binet Intelligence Scales, Fifth Edition (SB5)
a test that consists of a series of items that vary according to the age of the person being tested

Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)
a test for children that provides separate measures of verbal and performance (or nonverbal) skills, as well as a total score

Kaufman Assessment Battery for Children, Second Edition (KABC-II)
an intelligence test that measures children's ability to integrate different stimuli simultaneously and step-by-step thinking

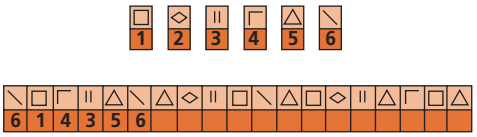
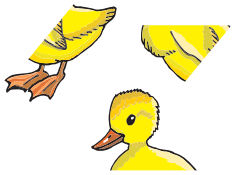
Measuring IQ: Present-Day Approaches to Intelligence. Since the time of Binet, tests of intelligence have become increasingly accurate measures of IQ. Most of them can still trace their roots to his original work in one way or another. For example, one of the most widely used tests—the **Stanford-Binet Intelligence Scales, Fifth Edition (SB5)**—began as an American revision of Binet's original test. The test consists of a series of items that vary according to the age of the person being tested. For instance, young children are asked to answer questions about everyday activities or to copy complex figures. Older people are asked to explain proverbs, solve analogies, and describe similarities between groups of words. The test is administered orally, and test-takers are given progressively more difficult problems until they are unable to proceed.

The **Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)** is another widely used intelligence test. The test (which stems from its adult counterpart, the *Wechsler Adult Intelligence Scale*) provides measures of verbal and nonverbal skills, as well as a total score. As you can see from the sample items in Figure 9-14, the test includes a variety of types of items, allowing for easier identification of any specific problems a test-taker may have (Zhu & Weiss, 2005).

The **Kaufman Assessment Battery for Children, Second Edition (KABC-II)** takes a different approach than the Stanford-Binet and WISC-IV. In the KABC-II, children are tested on their ability to integrate different kinds of stimuli simultaneously and to use

Figure 9-14 Measuring Intelligence

The Wechsler Intelligence Scales for Children (WISC-IV) includes items such as these. What do such items cover? What do they miss?

Name	Goal of Item	Example
Information	Assess general information	How many nickels make a dime?
Comprehension	Assess understanding and evaluation of social norms and past experience	What is the advantage of keeping money in the bank?
Arithmetic	Assess math reasoning through verbal problems	If two buttons cost 15 cents, what will be the cost of a dozen buttons?
Similarities	Test understanding of how objects or concepts are alike, tapping abstract reasoning	In what way are an hour and a week alike?
Digit symbol	Assess speed of learning	Match symbols to numbers using key. 
Picture completion	Visual memory and attention	Identify what is missing. 
Object assembly	Test understanding of relationship of parts to wholes	Put pieces together to form a whole. 

step-by-step thinking. A special virtue of the KABC-II is its flexibility. It allows the person giving the test to use alternative wording or gestures, or even to pose questions in a different language, in order to maximize a test-taker's performance. This capability of the KABC-II makes testing more valid and equitable for children to whom English is a second language (Kaufman et al., 2005).

What do the IQ scores derived from IQ tests mean? For most children, IQ scores are reasonably good predictors of their school performance. That's not surprising, given that the initial impetus for the development of intelligence tests was to identify children who were having difficulties in school (Sternberg & Grigorenko, 2002).

But when it comes to performance outside of academic spheres, the story is different. For instance, although people with higher IQ scores are apt to finish more years of schooling, once this is statistically controlled for, IQ scores are not closely related to income and later success in life. Furthermore, IQ scores are frequently inaccurate when it comes to predicting a particular individual's future success. For example, two people with different IQ scores may both finish their bachelor's degrees at the same college, and the person with a lower IQ might end up with a higher income and a more successful career. Because of these difficulties with traditional IQ scores, researchers have turned to alternative approaches to intelligence (McClelland, 1993).

WHAT IQ TESTS DON'T TELL: ALTERNATIVE CONCEPTIONS OF INTELLIGENCE. The intelligence tests used most frequently in school settings today are based on the idea that intelligence is a single factor, a unitary mental ability. This one main attribute has commonly been called *g* (Spearman, 1927; Lubinski, 2004). The *g* factor is assumed to underlie performance on every aspect of intelligence, and it is the *g* factor that intelligence tests presumably measure.

Many theorists, however, dispute the notion that intelligence is unidimensional. Some developmentalists suggest that two kinds of intelligence exist: fluid intelligence and crystallized intelligence. **Fluid intelligence** reflects information processing capabilities, reasoning, and memory. For example, a student asked to group a series of letters according to some criterion or to remember a set of numbers would be using fluid intelligence (Cattell, 1987; Salthouse, Pink, & Tucker-Drob, 2008; Shangguan & Shi, 2009; Ziegler et al., 2012).

fluid intelligence
intelligence that reflects information processing capabilities, reasoning, and memory

In contrast, **crystallized intelligence** is the accumulation of information, skills, and strategies that people have learned through experience and that they can apply in problem-solving situations. A student would likely be relying on crystallized intelligence to solve a puzzle or deduce the solution to a mystery, in which it was necessary to draw on past experience (McGrew, 2005; Alfonso, Flanagan, & Radwan, 2005; Thorsen, Gustafsson, & Cliffordson, 2014).

crystallized intelligence
the accumulation of information, skills, and strategies that people have learned through experience and that they can apply in problem-solving situations

Other theorists divide intelligence into an even greater number of parts. For example, psychologist Howard Gardner suggests that we have at least eight distinct intelligences, each relatively independent (see Figure 9-15). Gardner suggests that these separate intelligences operate not in isolation, but together, depending on the type of activity in which we are engaged (Chen & Gardner, 2005; Gardner & Moran, 2006; Roberts & Lipnevich, 2012).

From *an educator's* perspective

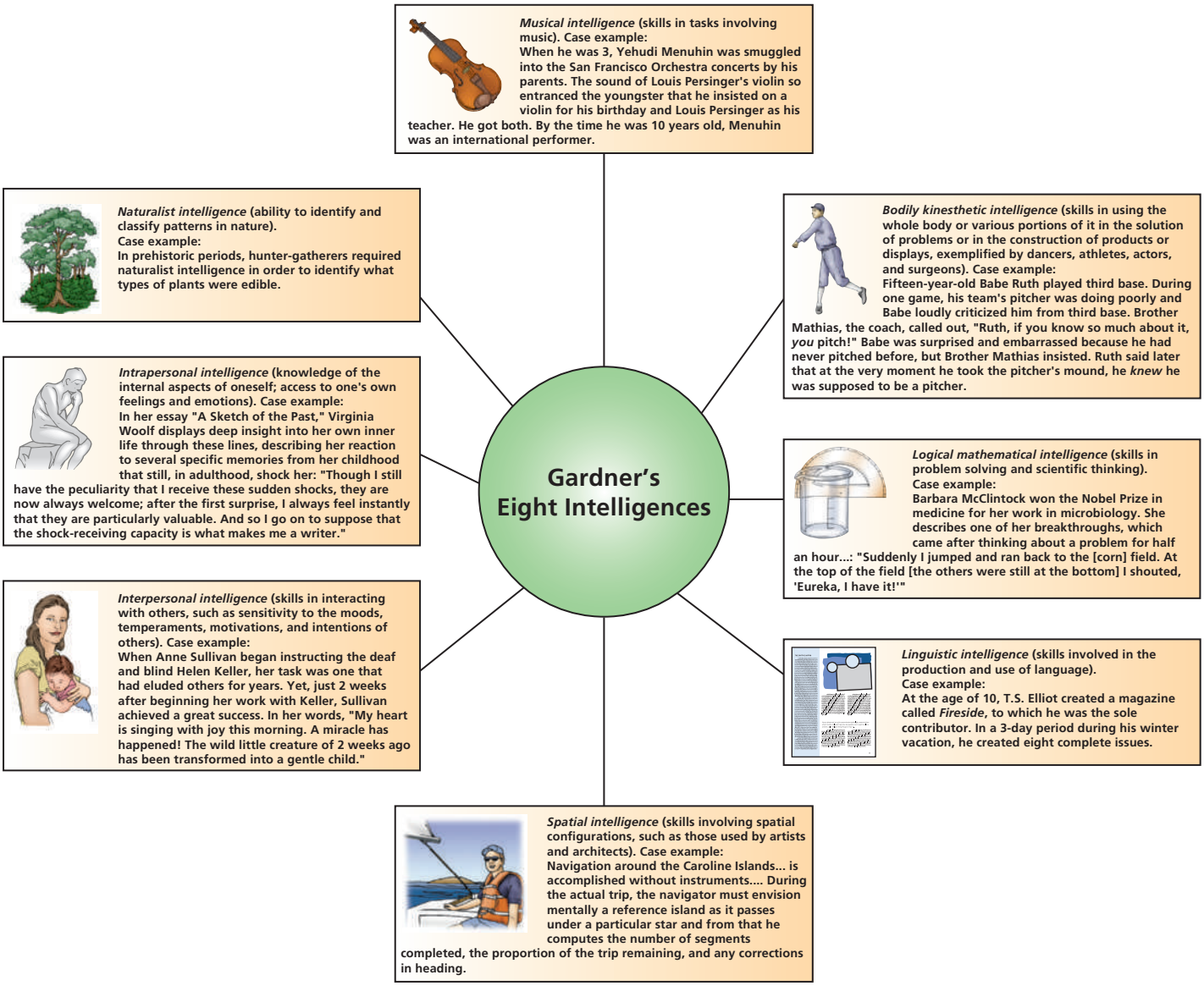
Does Howard Gardner's theory of multiple intelligences suggest that classroom instruction should be modified from an emphasis on the traditional 3Rs of reading, writing, and arithmetic?

Russian psychologist Lev Vygotsky, whose approach to cognitive development we discussed in Chapter 7, took a very different approach to intelligence. He suggested that to assess intelligence, we should look not only at those cognitive processes that are fully developed but at those that are currently being developed as well. To do this, Vygotsky contended that assessment tasks should involve cooperative interaction between the

Figure 9-15 Gardner's Eight Intelligences

Howard Gardner has theorized that there are eight distinct intelligences, each relatively independent.

(**Source:** Based on Walters & Gardner, 1986.)



individual who is being assessed and the person who is doing the assessment—a process called *dynamic assessment*. In short, intelligence is seen as being reflected not only in how children can perform on their own but also in terms of how well they perform when helped by adults (Vygotsky, 1927/1976; Lohman, 2005).

Taking yet another approach, psychologist Robert Sternberg (1990, 2003a) suggests that intelligence is best thought of in terms of information processing. In this view, the way in which people store material in memory and later use it to solve intellectual tasks provides the most precise conception of intelligence. Rather than focusing on the various subcomponents that make up the *structure* of intelligence, then, information processing approaches examine the *processes* that underlie intelligent behavior (Floyd, 2005).

Studies of the nature and speed of problem-solving processes show that people with higher intelligence levels differ from others not only in the number of problems they ultimately are able to solve but in their method of solving the problems as well. People with high IQ scores spend more time on the initial stages of problem solving, retrieving relevant information from memory. In contrast, those who score lower on traditional IQ

tests tend to spend less time on the initial stages, instead skipping ahead and making less informed guesses. The processes used in solving problems, then, may reflect important differences in intelligence (Sternberg, 2005).

Sternberg's work on information processing approaches to intelligence led him to develop the **triarchic theory of intelligence**. According to this model, intelligence consists of three aspects of information processing: the componential element, the experiential element, and the contextual element. The *componential* aspect of intelligence reflects how efficiently people can process and analyze information. Efficiency in these areas allows people to infer relationships among different parts of a problem, solve the problem, and then evaluate their solution. People who are strong on the componential element score highest on traditional tests of intelligence (Sternberg, 2005; Ekinci, 2014).

Bodily kinesthetic intelligence, as displayed by dancers, ballplayers, and gymnasts, is one of Gardner's eight intelligences. What are some examples of other Gardner intelligences?

The *experiential* element is the insightful component of intelligence. People who have a strong experiential element can easily compare new material with what they already know and can combine and relate facts that they already know in novel and creative ways. Finally, the *contextual* element of intelligence concerns practical intelligence, or ways of dealing with the demands of the everyday environment.

In Sternberg's view, people vary in the degree to which each of these three elements is present. Our level of success at any given task reflects the match between the task and our own specific pattern of strength on the three components of intelligence (Sternberg, 2003b, 2008).

triarchic theory of intelligence
a model that states that intelligence consists of three aspects of information processing: the componential element, the experiential element, and the contextual element

GROUP DIFFERENCES IN IQ. A "jontry" is an example of a

a. rulpow **b.** flink **c.** spudge **d.** bakwoe

If you were to find an item composed of nonsense words such as this on an intelligence test, your immediate—and quite legitimate—reaction would likely be to complain. How could a test that purports to measure intelligence include test items that incorporate meaningless terminology?

Yet for some people, the items actually used on traditional intelligence tests might appear equally nonsensical. To take a hypothetical example, suppose children living in rural areas were asked details about subways, while those living in urban areas were asked about the mating practices of sheep. In both cases, we would expect that the previous experiences of test-takers would have a substantial effect on their ability to answer the questions. And if questions about such matters were included on an IQ test, the test could rightly be viewed as a measure of prior experience rather than of intelligence.

Although the questions on traditional IQ tests are not so obviously dependent on test-takers' prior experiences as our examples, cultural background and experience do have the potential to affect intelligence test scores. Many educators suggest that traditional measures of intelligence are subtly biased in favor of white, upper- and middle-class students and against groups with different cultural experiences (Ortiz & Dynda, 2005).

EXPLAINING RACIAL DIFFERENCES IN IQ. The issue of how cultural background and experience influence IQ test performance has led to considerable debate among researchers. The debate has been fueled by the finding that IQ scores of certain racial groups are consistently lower, on average, than the IQ scores of other groups. For example, the mean score of African Americans tends to be about 15 IQ points lower than the mean score of whites—although the measured difference varies a great deal depending on the particular IQ test employed (Fish, 2001; Maller, 2003).

The question that emerges from such differences, of course, is whether they reflect actual differences in intelligence or, instead, are caused by bias in the intelligence tests

The issue of whether racial differences in IQ exist is highly controversial and ultimately relates to questions of the genetic and environmental determinants of intelligence.

themselves in favor of majority groups and against minorities. For example, if whites perform better on an IQ test than African Americans because of their greater familiarity with the language used in the test items, the test hardly can be said to provide a fair measure of the intelligence of African Americans. Similarly, an intelligence test that solely used African American Vernacular English could not be considered an impartial measure of intelligence for whites.

The question of how to interpret differences between intelligence scores of different cultural groups lies at the heart of one of the major controversies in child development: To what degree is an individual's intelligence determined by heredity and to what degree by environment? The issue is important because of its social implications. For instance, if intelligence is primarily determined by heredity and is therefore largely fixed at birth, attempts to alter cognitive abilities later in life, such as schooling, will meet with limited success. On the other hand, if intelligence is largely environmentally determined, modifying social and educational conditions is a more promising strategy for bringing about increases in cognitive functioning (Weiss, 2003; Nisbett et al., 2012).

***THE BELL CURVE* CONTROVERSY.** Although investigations into the relative contributions of heredity and environment to intelligence have been conducted for decades, the smoldering debate became a raging fire with the publication of a book by Richard J. Herrnstein and Charles Murray (1994), titled *The Bell Curve*. In the book, Herrnstein and Murray argue that the average 15-point IQ difference between whites and African Americans is due primarily to heredity rather than environment. Furthermore, they argue that this IQ difference accounts for the higher rates of poverty, lower employment, and higher use of welfare among minority groups as compared with majority groups.

The conclusions reached by Herrnstein and Murray raised a storm of protest, and many researchers who examined the data reported in the book came to conclusions that were quite different. Most developmentalists and psychologists responded by arguing that the racial differences in measured IQ can be explained by environmental differences between the races. In fact, when a variety of indicators of economic and social factors are statistically taken into account simultaneously, mean IQ scores of black and white children turn out to be actually quite similar. For instance, children from similar middle-class backgrounds, whether African American or white, tend to have similar IQ scores (Brooks-Gunn, Klebanov, & Duncan, 1996; Alderfer, 2003).

Furthermore, critics maintained that there is little evidence to suggest that IQ is a cause of poverty and other social ills. Some critics suggested, as mentioned earlier in this discussion, that IQ scores were unrelated in meaningful ways to later success in life (e.g., Nisbett, 1994; Reifman, 2000; Sternberg, 2005).

Finally, members of cultural and social minority groups may score lower than members of the majority group due to the nature of the intelligence tests themselves. It is clear that traditional intelligence tests may discriminate against minority groups who have not had exposure to the same environment that majority group members have experienced (Fagan & Holland, 2007; Razani et al., 2007).

Most traditional intelligence tests are constructed using white, English-speaking, middle-class populations as their test subjects. As a result, children from different cultural backgrounds may perform poorly on the tests—not because they are less intelligent but because the tests use questions that are culturally biased in favor of majority group members. A classic study found that in one California school district, Mexican American students were 10 times more likely than whites to be placed in special education classes (Mercer, 1973; Hatton, 2002).

More recent findings show that nationally, twice as many African American students as white students are classified as mildly intellectually disabled, a differ-

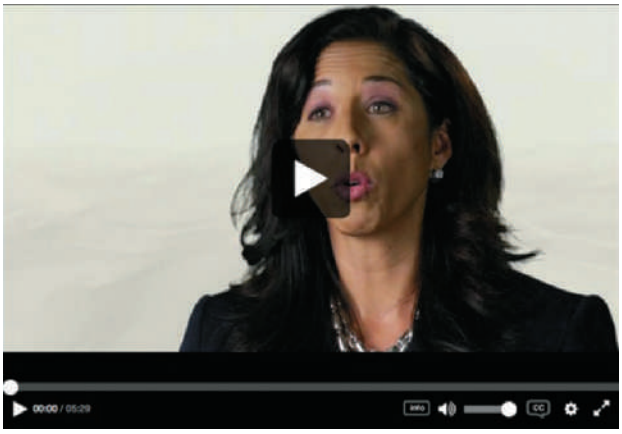
ence that experts attribute primarily to cultural bias and poverty. Although certain IQ tests (such as the *System of Multicultural Pluralistic Assessment*, or *SOMPA*) have been designed to be equally valid regardless of the cultural background of test-takers, no test can be completely without bias (Reschly, 1996; Sandoval et al., 1998; Hatton, 2002).

In short, most experts in the area of IQ were not convinced by *The Bell Curve* contention that differences in group IQ scores are largely determined by genetic factors. Still, we cannot put the issue to rest, largely because it is impossible to design a definitive experiment that can determine the cause of differences in IQ scores between members of different groups. (Thinking about how such an experiment might be designed shows the futility of the enterprise: One cannot ethically assign children to different living conditions to find the effects of environment, nor would one wish to genetically control or alter intelligence levels in unborn children.)

Today, IQ is seen as the product of *both* nature and nurture interacting with one another in a complex manner. Rather than seeing intelligence as produced by either genes or experience, genes are considered to affect experiences, and experiences are viewed as influencing the expression of genes. For instance, psychologist Eric Turkheimer has found evidence that while environmental factors play a larger role in influencing the IQ of poor children, genes are more influential in the IQ of affluent children (Turkheimer et al., 2003; Harden, Turkheimer, & Loehlin, 2007).

Ultimately, it may be less important to know the absolute degree to which intelligence is determined by genetic and environmental factors than it is to learn how to improve children's living conditions and educational experiences. By enriching the quality of children's environments, we will be in a better position to permit all children to reach their full potential and to maximize their contributions to society, whatever their individual levels of intelligence (Wickelgren, 1999; Posthuma & de Geus, 2006; Nisbett, 2008).

WATCH THIS VIDEO ON MYPSYCHLAB SPECIAL
TOPICS: INTELLIGENCE TESTING, THEN AND NOW



Below and Above Intelligence Norms: Intellectual Disabilities and the Intellectually Gifted

LO 9.12 Describe how children with intellectual disabilities and children who are intellectually gifted are educated in middle childhood.

Although Connie kept pace with her classmates in kindergarten, by the time she reached first grade, she was academically the slowest in almost every subject. It was not that she didn't try, but rather that it took her longer than other students to catch on to new material, and she regularly required special attention to keep up with the rest of the class.

On the other hand, in some areas she excelled: When asked to draw or produce something with her hands, she not only matched her classmates' performance but exceeded it, producing beautiful work that was much admired by her classmates. Although the other students in the class felt that there was something different about Connie, they were hard-pressed to identify the source of the difference, and in fact they didn't spend much time pondering the issue.

Connie's parents and teacher, though, knew what made her special. Extensive testing in kindergarten had shown that Connie's intelligence was well below normal, and she was officially classified as a special needs student.

If Connie had been attending school before 1975, she would most likely have been removed from her regular class as soon as her low IQ was identified, and placed in a class taught by a special needs teacher. Such classes, often consisting of students with a hodgepodge of afflictions, including emotional difficulties, severe reading problems, and physical disabilities such as multiple sclerosis, as well those with lower IQs, were traditionally kept separate and apart from the regular educational process.

This girl with Down syndrome is mainstreamed into this class.

All that changed in 1975 when Congress passed Public Law 94–142, the Education for All Handicapped Children Act. The intent of the law—an intent that has been largely realized—was to ensure that children with special needs received a full education in the **least restrictive environment**, the setting most similar to that of children without special needs (Yell, 1995).

In practice, the law has meant that children with special needs must be integrated into regular classrooms and regular activities to the greatest extent possible, as long as doing so is educationally beneficial. Children are to be isolated from the regular classroom only for those subjects that are specifically affected by their exceptionality; for all other subjects, they are to be taught with nonexceptional children in regular classrooms. Of course, some children with severe handicaps still need a mostly or entirely separate education, depending on the extent of their condition. But the goal of the law is to integrate exceptional children and typical children to the fullest extent possible (Yell, 1995).

least restrictive environment
the setting that is most similar to that of children without special needs

This educational approach to special education, designed to end the segregation of exceptional students as much as possible, has come to be called mainstreaming. In **mainstreaming**, exceptional children are integrated as much as possible into the traditional educational system and are provided with a broad range of educational alternatives (Hocutt, 1996; Belkin, 2004; Crosland & Dunlap, 2012).

mainstreaming
an educational approach in which exceptional children are integrated to the extent possible into the traditional educational system and are provided with a broad range of educational alternatives

ENDING SEGREGATION BY INTELLIGENCE LEVELS: THE BENEFITS OF MAINSTREAMING. In many respects, the introduction of mainstreaming—while clearly increasing the complexity of classroom teaching—was a reaction to failures of traditional special education. For one thing, there was little research support for the advisability of special education for exceptional students. Research that examined such factors as academic achievement, self-concept, social adjustment, and personality development generally failed to discern any advantages for special needs children placed in special, as opposed to regular, education classes. Furthermore, systems that compel minorities to be educated separately from majorities historically tend to be less effective—as an examination of schools that were once segregated on the basis of race clearly demonstrates (Wang, Reynolds, & Walberg, 1996).

Ultimately, however, the most compelling argument in favor of mainstreaming is philosophical: Because special needs students must ultimately function in a normal environment, greater experience with their peers ought to enhance their integration into society, as well as positively affect their learning. Mainstreaming, then, provides a mechanism to equalize the opportunities available to all children. The ultimate objective of mainstreaming is to ensure that all persons, regardless of ability or disability, have access to a full range of educational opportunities and, ultimately, a fair share of life's rewards (Fuchs & Fuchs, 1994; Scherer, 2004).

Does the reality of mainstreaming live up to its promise? To some extent, the benefits extolled by proponents have been realized. However, classroom teachers must receive substantial support in order for mainstreaming to be effective. It is not easy to teach a class in which students' abilities are significantly different from one another (Daly & Feldman, 1994; Scruggs & Mastropieri, 1994).

The benefits of mainstreaming have led some professionals to promote an alternative educational model known as full inclusion. *Full inclusion* is the integration of all students, even those with the most severe disabilities, into regular classes. In such a system, separate special education programs would cease to operate. Full inclusion is controversial,

and it remains to be seen how widespread such a practice will become (Lindsay, 2007; Mangiatordi, 2012; Justice et al., 2014).

BELOW THE NORM: INTELLECTUAL DISABILITY. Approximately 1 to 3 percent of the school-age population is considered to be intellectually disabled. Estimates vary so widely because the most commonly accepted definition of intellectual disability, which was previously referred to professionally as *mental retardation*, is one that leaves a great deal of room for interpretation. According to the American Association on Intellectual and Developmental Disabilities, **intellectual disability** is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. (American Association on Intellectual and Developmental Disabilities, 2012).

intellectual disability
a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills (AAIDD, 2012)

Most cases of intellectual disability are classified as *familial intellectual disability*, in which no cause is apparent, but there is a history of intellectual disability in the family. In other cases, there is a clear biological cause. The most common biological causes are *fetal alcohol syndrome*, which is produced by a mother's use of alcohol while pregnant, and *Down syndrome*, which results from the presence of an extra chromosome. Birth complications, such as a temporary lack of oxygen, may also produce intellectual disabilities (Plomin, 2005; West & Blake, 2005; Manning & Hoyme, 2007).

Although limitations in intellectual functioning can be measured in a relatively straightforward manner—using standard IQ tests—it is more difficult to determine how to gauge limitations in other areas. Ultimately, this imprecision leads to a lack of uniformity in the ways experts apply the label of "intellectual disability." Furthermore, it has resulted in significant variation in the abilities of people who are categorized as experiencing intellectual disability. Accordingly, intellectually disabled people range from those who can be taught to work and function with little special attention to those who are virtually untrainable and who never develop speech or such basic motor skills as crawling or walking.

The vast majority of the intellectually disabled—some 90 percent—have relatively low levels of deficits. Classified with **mild intellectual disability**, they score in the range of 50 or 55 to 70 on IQ tests. Typically, their intellectual disability is not even identified before they reach school, although their early development often is slower than average. Once they enter elementary school, their need for special attention usually become apparent, as it did with Connie, the first grader profiled at the beginning of this discussion. With appropriate training, these students can reach a third- to sixth-grade educational level, and although they cannot carry out complex intellectual tasks, they are able to hold jobs and function quite independently and successfully.

mild intellectual disability
intellectual disability in which IQ scores fall in the range of 50 or 55 to 70

Intellectual and adaptive limitations become more apparent, however, at higher levels of intellectual disabilities. People whose IQ scores range from around 35 or 40 to 50 or 55 are classified with **moderate intellectual disability**. Accounting for 5 and 10 percent of those classified as intellectually disabled, the moderately intellectually disabled display distinctive behavior early in their lives. They are slow to develop language skills, and their motor development is also affected. Regular schooling is usually not effective in training people with moderate intellectual disabilities to acquire academic skills, because generally they are unable to progress beyond the second-grade level. Still, they are capable of learning occupational and social skills, and they can learn to travel independently to familiar places. Typically, they require moderate levels of supervision.

moderate intellectual disability
intellectual disability in which IQ scores range from around 35 or 40 to 50 or 55

At the most significant levels of intellectual disability—those who are classified with **severe intellectual disability** (IQs ranging from around 20 or 25 to 35 or 40) and **profound intellectual disability** (IQs below 20 or 25)—the ability to function is severely limited. Usually, such people have little or no speech, have poor motor control, and may need 24-hour nursing care. At the same time, however, some people with severe intellectual disability are capable of learning basic self-care skills, such as dressing and eating, and they may even

severe intellectual disability
intellectual disability in which IQ scores range from around 20 or 25 to 35 or 40

profound intellectual disability
intellectual disability in which IQ scores fall below 20 or 25

develop the potential to become partially independent as adults. Still, the need for relatively high levels of care continues throughout the life span, and most severely and profoundly intellectually disabled people are institutionalized for the majority of their lives.

ABOVE THE NORM: THE GIFTED AND TALENTED

> *Amy Leibowitz picked up reading at age three. By five, she was writing her own books. First grade bored her within a week. As her school had no program for gifted children, it was suggested she skip to second grade. From there, she went to fifth grade. Her parents were proud but concerned. When they asked the fifth grade teacher where she felt Amy really belonged, the teacher said she was ready, academically, for high school.*

It sometimes strikes people as curious that the gifted and talented are considered to have a form of exceptionality. Yet the 3 to 5 percent of school-age children who are gifted and talented present special challenges of their own.

gifted and talented
children who show evidence of high-performance capability in areas such as intellectual, creative, artistic, leadership capacity, or specific academic fields

Which students are considered to be **gifted and talented**? Little agreement exists among researchers on a single definition of this rather broad category of students. However, the federal government considers the term *gifted* to include "children who give evidence of high performance capability in areas such as intellectual, creative, artistic, leadership capacity, or specific academic fields, and who require services or activities not ordinarily provided by the school in order to fully develop such capabilities" (Sec 582, P. L. 97–35-Education and Consolidation Act). Intellectual capabilities, then, represent only one type of exceptionality; unusual potential in areas outside the academic realm are also included in the concept. Gifted and talented children have so much potential that they, no less than students with low IQs, warrant special concern—although special school programs for them are often the first to be dropped when school systems face budgetary problems (Schemo, 2004; Mendoza, 2006; Olszewski-Kubilius, & Thomson, 2013).

People who are described as *gifted*—especially when the term is applied to those with exceptionally high intelligence—are often stereotyped as "unsociable," "poorly adjusted," and "neurotic." However, most research suggests that highly intelligent people tend to be outgoing, well adjusted, and popular (Bracken & Brown, 2006; Shaughnessy et al., 2006; Cross et al., 2008).

For instance, one landmark, long-term study of 1,500 gifted students, which began in the 1920s, found that not only were the gifted smarter than average, but they were also healthier, better coordinated, and psychologically better adjusted than their less intelligent classmates. Furthermore, their lives played out in ways that most people would envy. The subjects received more awards and distinctions, earned more money, and made many more contributions in art and literature than the average person. For instance, by the time they had reached the age of 40, they had collectively produced more than 90 books, 375 plays and short stories, and 2,000 articles, and they had registered more than 200 patents. Perhaps not surprisingly, they reported greater satisfaction with their lives than the nongifted (Sears, 1977; Shurkin, 1992; Reis & Renzulli, 2004).

Yet being gifted and talented is no guarantee of success in school, as we can see if we consider the particular components of the category. For example, the verbal abilities that allow the eloquent expression of ideas and feelings can equally permit the expression of glib and persuasive statements that happen to be inaccurate. Furthermore, teachers may sometimes misinterpret the humor, novelty, and creativity of unusually gifted children and see their intellectual fervor as disruptive or inappropriate. And peers are not always sympathetic: Some very bright children try to hide their intelligence in an effort to fit in better with other students (Swiatek, 2002).

acceleration
special programs that allow gifted students to move ahead at their own pace, even if this means skipping to higher grade levels

EDUCATING THE GIFTED AND TALENTED. Educators have devised two approaches to teaching the gifted and talented: acceleration and enrichment. **Acceleration** allows gifted students to move ahead at their own pace, even if this means skipping to higher grade levels. The materials that students receive under acceleration programs are not necessarily different from what other students receive; they simply are provided at a faster

pace than for the average student (Smutny, Walker, & Meckstroth, 2007; Wells, Lohman, & Marron, 2009; Lee, Olszewski-Kubilius, & Thomson, 2012).

An alternative approach is **enrichment**, through which students are kept at grade level but are enrolled in special programs and given individual activities to allow greater depth of study on a given topic. In enrichment, the material provided to gifted students differs not only in the timing of its presentation but in its sophistication as well. Thus, enrichment materials are designed to provide an intellectual challenge to the gifted student, encouraging higher-order thinking (Worrell, Szarko, & Gabelko, 2001; Rotigel, 2003).

enrichment
an approach through which students are kept at grade level but are enrolled in special programs and given individual activities to allow greater depth of study on a given topic

Acceleration programs can be remarkably effective. Most studies have shown that gifted students who begin school considerably earlier than their age-mates do as well as or better than those who begin at the traditional age. One of the best illustrations of the benefits of acceleration is the "Study of Mathematically Precocious Youth," an ongoing program at Vanderbilt University. In this program, seventh and eighth graders who have unusual abilities in mathematics participate in a variety of special classes and workshops. The results have been nothing short of sensational, with students successfully completing college courses and sometimes even enrolling in college early. Some students have even graduated from college before the age of 18 (Lubinski & Benbow, 2006; Webb, Lubinski, & Benbow, 2002; Peters et al., 2014).

Module 9.3 Review

- The development of reading skills generally occurs in several stages. A combination of elements from code-based (i.e., phonics) approaches and whole-language approaches appears to offer the most promise.
- Multicultural education is in transition from a melting-pot model of cultural assimilation to a pluralistic society model.
- The measurement of intelligence has traditionally been a matter of testing skills that promote academic success. Recent theories of intelligence suggest that there may be several distinct intelligences or several components of intelligence that reflect different ways of processing information.
- U.S. educators are attempting to deal with substantial numbers of exceptional persons whose intellectual and other skills are significantly lower or higher than normal.

Journal Writing Prompt

Applying Lifespan Development: What are some of the challenges in measuring children's intelligence?

Epilogue

In this chapter, we discussed children's physical and cognitive development during the middle childhood years. We considered physical growth and its related nutrition and health concerns. We also looked at the intellectual growth that occurs at this time as interpreted by Piaget, information processing approaches, and Vygotsky. Children at this age show increased capabilities in memory and language, which facilitate and support gains in many other areas. We looked at some aspects of schooling worldwide and, especially, in the United States, concluding with an examination of intelligence: how it is defined, how it is tested, and how children who fall significantly below or above the intellectual norm are educated and treated.

Look back to the prologue, about Jan Vega's game-winning double play, and answer the following questions:

1. What kinds of physical abilities permit Jan to play baseball? How did these abilities change as she moved from preschool into middle childhood? What abilities does she probably still lack, given her developmental stage?
2. In her calculations to make the game-winning double play, did Jan use fluid or crystallized intelligence, or both? Explain your answer using examples from the story.
3. What evidence in Jan's story shows that she has achieved what Piaget calls concrete operational thinking?
4. If Jan had special needs that reduced her physical abilities, should she be encouraged to participate in sports with other children? If so, under what circumstances should such participation occur?

Looking Back

LO 9.1 Describe ways in which children grow during middle childhood and factors that influence their growth.

The middle childhood years are characterized by slow and steady growth. Weight is redistributed as baby fat disappears. In part, growth is genetically determined, but societal factors such as affluence, dietary habits, nutrition, and disease also contribute significantly.

LO 9.2 Outline the course of motor development in middle childhood.

During the middle childhood years, great improvements occur in gross motor skills. Cultural expectations appear to underlie most gross motor skill differences between boys and girls. Fine motor skills also develop rapidly.

LO 9.3 Summarize the main physical and mental health concerns of school-age children.

Adequate nutrition is important because of its contributions to growth, health, social and emotional functioning, and cognitive performance. Obesity is partially influenced by genetic factors but is also associated with children's failure to develop internal controls, overeating, overindulgence in sedentary activities such as television viewing, and lack of physical exercise. Asthma and childhood depression are fairly prevalent among children of school age.

LO 9.4 Describe the sorts of special needs that may become apparent in school-age children and how can they be met.

Visual, auditory, and speech impairments, as well as other learning disabilities, can lead to academic and social problems and must be handled with sensitivity and appropriate assistance. Children with attention-deficit/hyperactivity disorder exhibit another form of special need. ADHD is characterized by inattention, impulsiveness, failure to complete tasks, lack of organization, and excessive amounts of uncontrollable activity. Treatment of ADHD by drugs is highly controversial because of unwanted side effects and doubts about long-term consequences.

LO 9.5 Summarize the Piagetian view of cognitive development in middle childhood.

According to Piaget, school-age children enter the concrete operational period and for the first time become capable of applying logical thought processes to concrete problems.

LO 9.6 Explain how children develop cognitively in middle childhood according to information processing approaches.

According to information processing approaches, children's intellectual development in the school years can be attributed to substantial increases in memory capacity and the sophistication of the "programs" children can handle.

LO 9.7 Summarize Vygotsky's interpretation of cognitive development during middle childhood.

Vygotsky recommends that students focus on active learning through child–adult and child–child interactions that fall within each child's zone of proximal development.

LO 9.8 Describe how language develops during middle childhood.

The language development of children in the school years is substantial, with improvements in vocabulary, syntax, and pragmatics. Children learn to control their behavior through linguistic strategies, and they learn more effectively by seeking clarification when they need it. Bilingualism can be beneficial in the school years. Children who are taught all subjects in the first language, with simultaneous instruction in English, appear to experience few deficits and attain several linguistic and cognitive advantages.

LO 9.9 Explain how children learn to read.

The development of reading skills, which is fundamental to schooling, generally occurs in several stages: identifying letters, reading highly familiar words, sounding out letters and blending sounds into words, reading words with fluency but with little comprehension, reading with comprehension and for practical purposes, and reading material that reflects multiple points of view.

LO 9.10 Summarize what schools teach beyond the basics in middle childhood.

Multiculturalism and diversity are significant issues in U.S. schools, where the melting-pot society, in which minority cultures are assimilated to the majority culture, is being replaced by the pluralistic society, in which individual cultures maintain their own identities while participating in the definition of a larger culture.

LO 9.11 Describe how intelligence is measured and what controversies arise from measuring it.

Intelligence testing has traditionally focused on factors that differentiate successful academic performers from unsuccessful ones. The intelligence quotient, or IQ score, reflects the ratio of a person's mental age to his or her chronological age. Other conceptualizations of intelligence focus on different types of intelligence or on different aspects of the information processing task.

LO 9.12 Describe how children with intellectual disabilities and children who are intellectually gifted are educated in middle childhood.

In today's schools, exceptional children—including children with intellectual deficits—are to be educated in the least restrictive environment, typically the regular classroom. If done properly, this strategy can benefit all students and permit the exceptional student to focus on strengths rather than weaknesses. Gifted and talented children can benefit from special educational programs, including acceleration programs and enrichment programs.

Key Terms and Concepts

asthma 308
visual impairment 310
auditory impairment 311
speech impairment 311
childhood-onset fluency disorder (stuttering) 311
specific learning disorders 312
attention-deficit/hyperactivity disorder (ADHD) 312
concrete operational stage 315
decentering 315
memory 317
metamemory 318
metalinguistic awareness 320
bilingualism 321
cultural assimilation model 326
multicultural education 326
pluralistic society model 327
bicultural identity 327
intelligence 328
mental age 329
chronological (or physical) age 329
intelligence quotient (or IQ score) 329
Stanford-Binet Intelligence Scales, Fifth Edition (SB5) 330
Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV) 330
Kaufman Assessment Battery for Children, Second Edition (KABC-II) 330
fluid intelligence 331
crystallized intelligence 331
triarchic theory of intelligence 333
least restrictive environment 336
mainstreaming 336
intellectual disability 337
mild intellectual disability 337
moderate intellectual disability 337
severe intellectual disability 337
profound intellectual disability 337
gifted and talented 338
acceleration 338
enrichment 339

Chapter 10

Social and Personality Development in Middle Childhood

Learning Objectives

LO 10.1 Describe the major developmental challenge of middle childhood.

LO 10.2 Summarize ways in which children's views of themselves change during middle childhood.

LO 10.3 Explain why self-esteem is important during middle childhood.

LO 10.4 Describe how children's sense of right and wrong changes in middle childhood.

LO 10.5 Describe the sorts of relationships and friendships that are typical of middle childhood.

LO 10.6 Describe what makes a child popular and why it is important in middle childhood.

LO 10.7 Describe how gender affects friendships in middle childhood.

LO 10.8 Describe how friendships between the races change during the school years.

LO 10.9 Summarize how today's diverse family and care arrangements affect children in middle childhood.

LO 10.10 Describe how children's social and emotional lives affect their school performance in middle childhood.

Chapter Overview

Prologue: Who Is This Kid?

Ask five different people about Dave Rudowski, and you might get five different descriptions of this 10-year-old. "Rudowski's awesome!" says his best friend, Paul. "He's really good at math and is genius at *Call of Duty*." Dave's teacher agrees he has above-average abilities. "But he's a bit lazy," she says. "Homework comes in late. Careless spelling errors." The captain of the fourth grade soccer team thinks Dave is sort of a nerd. "He's not much into sports, but he's funny, so that's okay." A classmate who's in the school band with Dave says he's really into music. "He plays the drums and when he lets go, he's amazing." His mother affectionately calls him Big Brother. "Dave is the eldest child," she explains. "He's so good with his little brothers and sisters, always inventing games to play with them."

And how does Dave view himself? "I kind of like to go my own way," he says. "My mind is always thinking up new projects or a way to do something better. I've got a couple of friends. I really don't need more." ■

Looking Ahead

As children grow into middle childhood, they experience significant transformations in the way they relate to others and the way they think of themselves. As Dave's story shows, personality development becomes many-faceted and complex in these years, and it has profound implications for social relationships with both peers and adults.

In this chapter, we focus on social and personality development during middle childhood. It is a time when children's views of themselves change, they form new bonds with friends and family, and they become increasingly attached to social institutions outside the home.

We start our consideration of personality and social development during middle childhood by examining the changes that occur in the ways children see themselves. We discuss how they view their personal characteristics, and we examine the complex issue of self-esteem.

Next, the chapter turns to relationships during middle childhood. We discuss the stages of friendship and the ways gender and

Children's understanding of themselves continues to change during middle childhood.

According to Erik Erikson, middle childhood encompasses the industry-versus-inferiority stage, characterized by a focus on meeting the challenges presented by the world.

ethnicity affect how and with whom children interact. We also examine how to improve children's social competence.

The last part of the chapter explores the central societal institution in children's lives: the family. We consider the consequences of divorce, self-care children, and the phenomenon of group care.

The Developing Self

Karla Holler sits comfortably in the treehouse she built in a tall apple tree growing in her suburban home's backyard. At age nine, she's just finished the latest addition, nailing pieces of wood together, expertly wielding a hammer. She and her father started building the treehouse when she was 5 years old, and she has been making small additions to it ever since. By this point, she has developed a clear sense of pride regarding the treehouse, and she spends hours in it, savoring the privacy it provides.

Karla's growing sense of competence is reflected in this passage. Conveying what psychologist Erik Erikson calls "industriousness," Karla's quiet pride in her accomplishment illustrates one of the ways in which children's views of themselves evolve.

Psychosocial Development in Middle Childhood

LO 10.1 Describe the major developmental challenge of middle childhood.

According to Erik Erikson, whose approach to psychosocial development we last discussed in Chapter 8, middle childhood is very much about competence. Lasting from roughly age 6 to age 12, the **industry-versus-inferiority stage** is characterized by a focus on efforts to meet the challenges presented by parents, peers, school, and the other complexities of the modern world.

industry-versus-inferiority stage according to Erikson, the period from age 6 to 12 characterized by a focus on efforts to attain competence in meeting the challenges presented by parents, peers, school, and the other complexities of the modern world

As children move through middle childhood, school presents enormous challenges. They must direct their energies not only to mastering what they are presented in school, which encompasses an enormous body of information, but also to making a place for themselves in their social worlds. They increasingly work with others in group activities and must navigate among different social groups and roles, including relationships involving teachers, friends, and families.

Success in the industry-versus-inferiority stage brings with it feelings of mastery and proficiency and a growing sense of competence, like those expressed by Karla when she talks about his building experience. On the other hand, difficulties in this stage lead to feelings of failure and inadequacy. As a result, children may withdraw both from academic pursuits, showing less interest and motivation to excel, and from interactions with peers.

Children may find that attaining a sense of industry during the middle childhood years has lasting consequences. For example, one study examined how childhood industriousness and hard work were related to adult behavior by following a group of 450 men over a 35-year period, starting in early childhood (Vaillant & Vaillant, 1981). The men who were most industrious and hardworking during childhood were most successful as adults, both in occupational attainment and in their personal lives. In fact, childhood industriousness was more closely associated with adult success than was intelligence or family background.

Understanding One's Self: A New Response to "Who Am I?"

LO 10.2 Summarize ways in which children's views of themselves change during middle childhood.

During middle childhood, children continue their efforts to answer the question "Who am I?" as they seek to understand the nature of the self. Although the question does not yet have the urgency it will assume in adolescence, elementary-school-age children still seek to pin down their place in the world.

THE SHIFT IN SELF-UNDERSTANDING FROM THE PHYSICAL TO THE PSYCHOLOGICAL. Children are on a quest for self-understanding during middle childhood. Helped by the cognitive advances that we discussed in the previous chapter, they begin to view themselves less in terms of external, physical attributes and more in terms of psychological traits (Marsh & Ayotte, 2003; Sotiriou & Zafiropoulou, 2003; Lerner, Theokas, & Jelicic, 2005; Bosacki, 2013, 2014).

For instance, six-year-old Carey describes herself as "a fast runner and good at drawing"—both characteristics dependent on skill in external activities relying on motor skills. In contrast, 11-year-old Meiping characterizes herself as "pretty smart, friendly, and helpful to my friends." Meiping's view of herself is based on psychological characteristics, inner traits that are more abstract than the younger child's descriptions. The use of inner traits to determine self-concept results from the child's increasing cognitive skills, a development that we discussed in Chapter 9.

In addition to shifting focus from external characteristics to internal, psychological traits, children's views of who they are become less simplistic and have greater complexity. In Erikson's view, children are seeking endeavors where they can be successfully industrious. As they get older, children discover that they may be good at some things and not so good at others. Ten-year-old Ginny, for instance, comes to understand that she is good at arithmetic but not very good at spelling; 11-year-old Alberto determines that he is good at softball but doesn't have the stamina to play soccer very well.

Children's self-concepts become divided into personal and academic spheres. As can be seen in Figure 10-1, children evaluate themselves in four major areas, and each of these areas can be broken down even further. For instance, the nonacademic self-concept includes the components of physical appearance, peer relations, and physical ability. Academic self-concept is similarly divided. Research on students' self-concepts in English, mathematics, and nonacademic realms has found that the separate self-concepts are not always correlated, although there is overlap among them. For example, a child who sees herself as a star math student is not necessarily going to feel she is great at English (Marsh & Hau, 2004; Ehm, Lindberg & Hasselhorn, 2013).

SOCIAL COMPARISON. If someone asks you how good you are at math, how would you respond? Most of us would compare our performance to that of others who are roughly of the same age and educational level. It is unlikely that we'd answer the question by comparing ourselves either to Albert Einstein or to a kindergartner just learning about numbers.

Elementary-school-age children begin to follow the same sort of reasoning when they seek to understand how able they are. When they were younger, they tended to consider their abilities in terms of some hypothetical standard, making a judgment that they are good or bad in an absolute sense. Now they begin to use social comparison processes, comparing themselves to others, to determine their levels of accomplishment during middle childhood (Weiss, Ebbeck, & Horn, 1997).

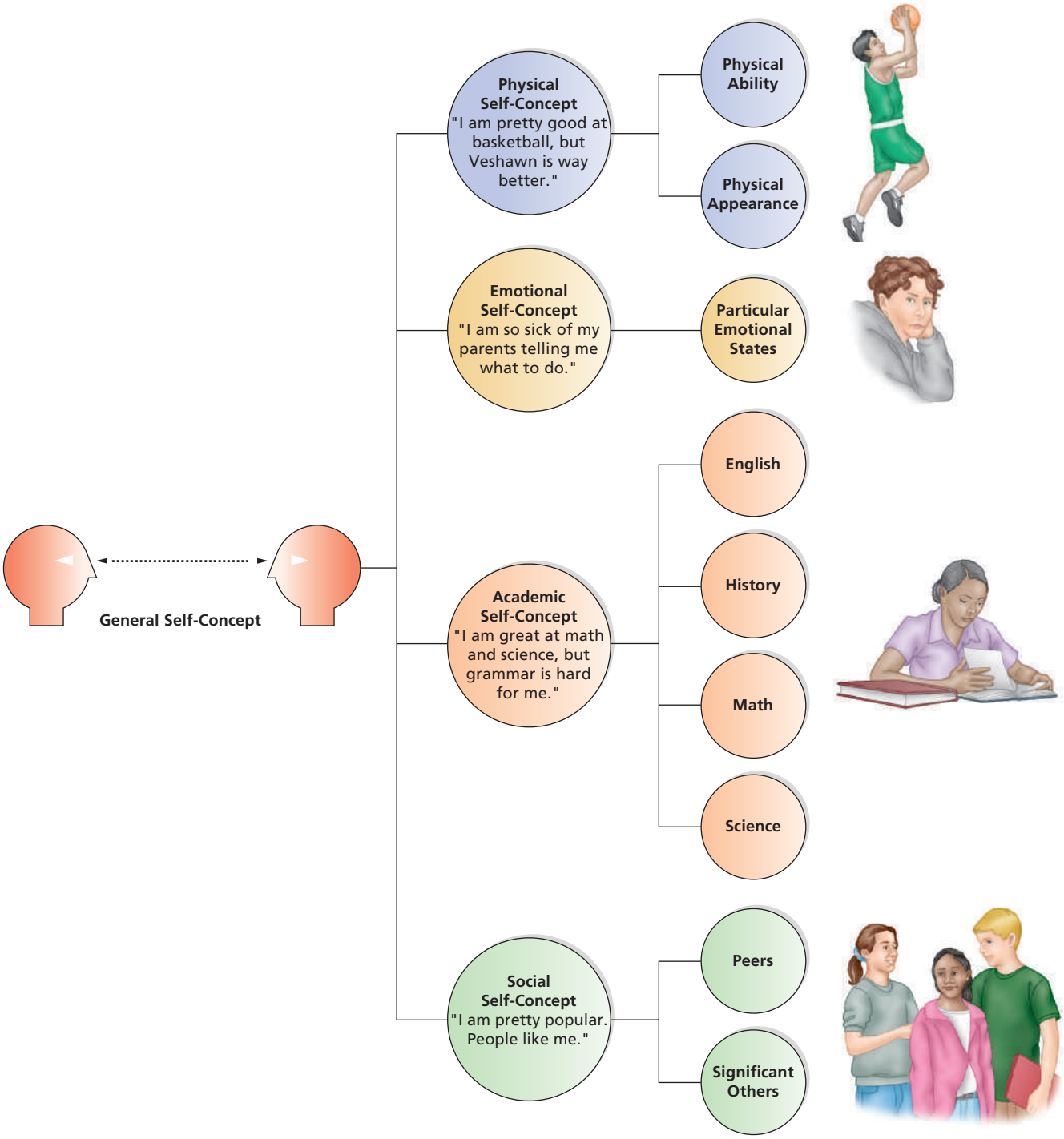
Social comparison is the desire to evaluate one's own behavior, abilities, expertise, and opinions by comparing them to those of others. According to a theory first suggested by psychologist Leon Festinger (1954), when concrete, objective measures of ability are

social comparison
the desire to evaluate one's own behavior, abilities, expertise, and opinions by comparing them to those of others

Figure 10-1 Looking Inward: The Development of Self

As children get older, their views of self become more differentiated, comprising several personal and academic spheres. What cognitive changes make this possible?

(**Source:** Based on Shavelson, Hubner, & Stanton, 1976.)



lacking, people turn to *social reality* to evaluate themselves. Social reality refers to understanding that is derived from how others act, think, feel, and view the world.

But who provides the most adequate comparison? When they cannot objectively evaluate their ability, children during middle childhood increasingly look to others who are similar to themselves (Summers, Schallert, & Ritter, 2003).

Downward Social Comparison. Although children typically compare themselves to others who are similar, in some cases—particularly when their self-esteem is at

stake—they choose to make *downward social comparisons* with others who are obviously less competent or successful Such downward social comparison protects children's self-esteem. By comparing themselves to those who are less able, children ensure that they will come out on top and thereby preserve an image of themselves as successful (Hui et al., 2006:Hosogi et al., 2012; Sheskin, Bloom & Wynn, 2014).

Downward social comparison helps explain why some students in elementary schools with generally low achievement levels are found to have stronger academic self-esteem than very capable students in schools with high achievement levels. The reason seems to be that students in the low-achievement schools observe others who are not doing terribly well academically, and they feel relatively good by comparison. In contrast, students in the high-achievement schools may find themselves competing with a more academically proficient group of students, and their perception of their performance may suffer in comparison. At least in terms of self-esteem, then, it is better to be a big fish in a small pond than a small fish in a big one (Marsh & Hau, 2003; Marsh et al., 2008; Visconti, Kochenderfer-Ladd & Clifford, 2013).

Self-Esteem: Developing a Positive—or Negative—View of the Self

LO 10.3 Explain why self-esteem is important during middle childhood.

Children don't dispassionately view themselves just in terms of an itemization of physical and psychological characteristics. Instead, they make judgments about themselves as being good or bad in particular ways. **Self-esteem** is an individual's overall and specific positive and negative self-evaluation. Whereas self-concept reflects beliefs and cognitions about the self (*I am good at trumpet; I am not so good at social studies*), self-esteem is more emotionally oriented (*Everybody thinks I'm a nerd.*) (Davis-Kean & Sandler, 2001; Bracken & Lamprecht, 2003).

self-esteem
an individual's overall and specific positive and negative self-evaluation

Self-esteem develops in important ways during middle childhood. As we've noted, children increasingly compare themselves to others, and as they do, they assess how well they measure up to society's standards. In addition, they increasingly develop their own internal standards of success, and they can see how well they compare to those. One of the advances that occurs during middle childhood is that, like self-concept, self-esteem becomes increasingly differentiated. At the age of seven, most children have self-esteem that reflects a global, fairly simple view of themselves. If their overall self-esteem is positive, they believe that they are relatively good at all things. Conversely, if their overall self-esteem is negative, they feel that they are inadequate at most things (Lerner et al., 2005; Harter, 2006).

As children progress into the middle childhood years, however, their self-esteem is higher for some areas and lower in others. For example, a boy's overall self-esteem may be composed of positive self-esteem in some areas (such as the positive feelings he gets from his artistic ability) and more negative self-esteem in others (such as the unhappiness he feels over his athletic skills).

CHANGE AND STABILITY IN SELF-ESTEEM. Generally, overall self-esteem is high during middle childhood, but it begins to decline around the age of 12. Although there are probably several reasons for the decline, the main one appears to be the school transition that typically occurs around this age: Students leaving elementary school and entering either middle school or junior high school show a decline in self-esteem, which then gradually rises again (Twenge & Campbell, 2001; Robins & Trzesniewski, 2005; Poorthuis et al., 2014).

From *an educator's* perspective

What can teachers do to help children whose low self-esteem is causing them to fail? How can this cycle of failure be broken?

On the other hand, some children have chronically low self-esteem. Children with low self-esteem face a tough road, in part because their self-esteem becomes enmeshed in a cycle of failure that grows increasingly difficult to break. Assume, for instance, that Harry, a student with chronically low self-esteem, is facing an important test. Because of his low self-esteem, he expects to do poorly. As a consequence, he is quite anxious—so anxious that he is unable to concentrate well and study effectively. Furthermore, he may decide not to study much because he figures that if he's going to do badly anyway, why bother studying?

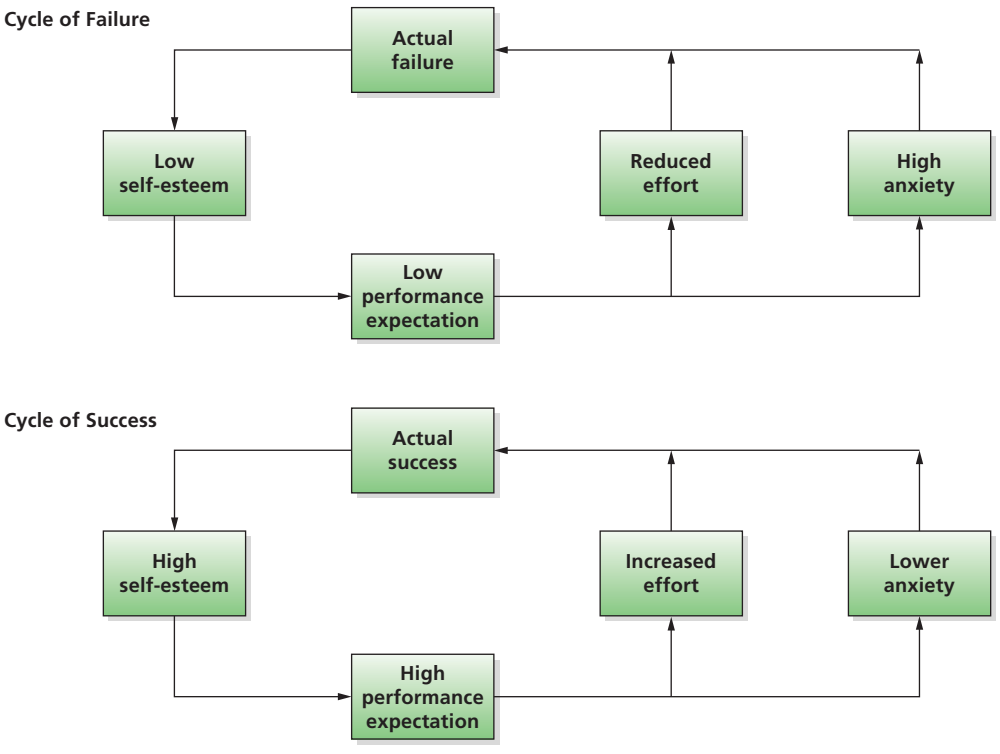
Ultimately, of course, Harry's high anxiety and lack of effort bring about the result he expected: He does poorly on the test. This failure, which confirms Harry's expectation, reinforces his low self-esteem, and the cycle of failure continues (see Figure 10-2).

In contrast, students with high self-esteem travel a more positive path, falling into a cycle of success. Having higher expectations leads to increased effort and lower anxiety, increasing the probability of success. In turn, this helps affirm their higher self-esteem that began the cycle.

Parents can help break the cycle of failure by promoting their children's self-esteem. The best way to do this is through the use of the *authoritative* childrearing style that we discussed in Chapter 8. Authoritative parents are warm and emotionally supportive, while still setting clear limits for their children's behavior. In contrast, other parenting styles have less positive effects on self-esteem. Parents who are highly punitive and controlling send a message to their children that they are untrustworthy and unable to make good decisions—a message that can undermine children's sense of adequacy. Highly indulgent parents, who indiscriminately praise and reinforce their children

Figure 10-2 A Cycle of Low Self-Esteem

Because children with low self-esteem may expect to do poorly on a test, they may experience high anxiety and not work as hard as those with higher self-esteem. As a result, they actually do perform badly on the test, which in turn confirms their negative view of themselves. In contrast, those with high self-esteem have more positive expectations, which leads to lower anxiety and higher motivation. As a consequence, they perform better, reinforcing their positive self-image. How would a teacher help students with low self-esteem break out of their negative cycle?



From Research to Practice

The Danger of Inflated Praise

If you knew that a child was having some self-esteem problems, what do you think might be some helpful things to say to that child? If you guessed that lavish praise would encourage the child to feel better about himself or herself, you're not alone. Most adults believe that children need praise in order to feel good about themselves, and parenting advice in popular media often reinforces this notion (Brummelman, Thomaes, de Castro, et al., 2014; Brummelman, Thomaes, Overbeek, et al., 2014).

But how do children actually respond to praise? Research has shown that praise isn't always the beneficial thing we presume it to be. For example, praising children's native ability ("How smart you are!") rather than their effort ("You studied really hard!") has been shown to cause children to avoid challenges. It's easier to risk failure when all it means is that you didn't try hard enough rather than that you aren't good enough. So how would low-self-esteem children respond to well-intentioned inflated praise?

Not well, it turns out. In a recent study, children between 8 and 12 were shown a work of art and asked to draw a copy of it. Most of them then received written feedback on their drawings from a purported famous artist, who randomly told some children that they had made a beautiful drawing and told other children that they had made an incredibly beautiful drawing. Then the children were offered a choice of other works of art to attempt to copy—some were simple and easy whereas others were complex and difficult. It was emphasized to the children that they would learn more by trying the complex works, but they would make fewer mistakes by trying the simple ones (Brummelman et al., 2014).

Among the children who received restrained praise ("you made a beautiful drawing"), those with lower self-esteem chose tended to choose more challenging drawings to attempt next. But the pattern reversed for children who received inflated praise ("you made an *incredibly* beautiful drawing"), such that those with lower self-esteem tended to choose more simple drawings for their next attempt. The researchers concluded that inflated praise tends to trigger low self-esteem children to want to avoid revealing their presumed deficiencies, but tends to trigger high self-esteem children to want to show off the extent of their abilities. When it comes to using praise to boost children's self-esteem, the adage that less is more seems particularly apt (Brummelman et al., 2014).

Shared Writing Prompt

Why might it be the case that non-inflated praise has a greater tendency to induce challenge-seeking for low self-esteem children than it does for high self-esteem children?

regardless of their actual performance, can create a false sense of self-esteem in their children, which ultimately may be just as damaging to children (Milevsky et al., 2007; Taylor, et al., 2012; Raboteg-Saric & Sakic, 2013; Harris et al., 2015; also see the *From Research to Practice* box).

RACE AND SELF-ESTEEM. If you were a member of a racial group whose members routinely experienced prejudice and discrimination, it seems reasonable to predict that your self-esteem would be affected. Early research confirmed that hypothesis and found that African Americans had lower self-esteem than whites. For example, a set of pioneering studies a generation ago found that African American children shown black and white dolls preferred the white dolls over the black ones (Clark & Clark, 1947). The interpretation that was drawn from the study: The self-esteem of the African American children was low.

In pioneering research conducted several decades ago, African American girls' preference for white dolls was viewed as an indication of low self-esteem. More recent evidence, however, suggests that whites and African American children show little difference in self-esteem.

However, more recent research has shown these early assumptions to be overstated. The picture is more complex regarding relative levels of self-esteem between members of different racial and ethnic groups. For example, although white children initially show higher self-esteem than black children, black children begin to show slightly higher self-esteem than white children around the age of 11. This shift occurs as African American children become more closely identified with their racial group, develop more complex views of racial identity, and increasingly view the positive aspects of their group membership (Oyserman et al., 2003; Tatum, 2007; Sprecher, Brooks & Avogo, 2013).

Hispanic children also show an increase in self-esteem toward the end of middle childhood, although even in adolescence their self-esteem still trails that of whites. In contrast, Asian American children show the opposite pattern: Their self-esteem in

elementary school is higher than that of whites and blacks, but by the end of childhood, their self-esteem is lower than that of whites (Twenge & Crocker, 2002; Umana-Taylor, Diveri, & Fine, 2002; Tropp & Wright, 2003; Verkuyten, 2008).

One explanation for the complex relationship between self-esteem and minority group status comes from *social identity theory*. According to the theory, members of a minority group are likely to accept the negative views held by a majority group only if they perceive that there is little realistic possibility of changing the power and status differences between the groups. If minority group members feel that prejudice and discrimination can be reduced, and they blame society for the prejudice and not themselves, self-esteem should not differ between majority and minority groups (Tajfel & Turner, 2004; Thompson, Briggs-King, & LaTouche-Howard, 2012).

As group pride and ethnic awareness among minority group members has grown, differences in self-esteem between members of different ethnic groups have narrowed. This trend has been supported by an increased sensitivity to the importance of multiculturalism (Negy, Shreve, & Jensen, 2003; Lee, 2005; Tatum, 2007). (For another look at aspects of multiculturalism, see the *Developmental Diversity and Your Life* box.)

Developmental Diversity and Your Life

Are Children of Immigrant Families Well Adjusted?

Immigration to the United States has risen significantly in the last 50 years. Children in immigrant families account for almost 25 percent of children in the United States. In fact, children of immigrant families are the fastest-growing segment of children in the country (Hernandez et al., 2008).

In many ways, children of immigrants fare quite well. On one hand, they are better off than their nonimmigrant peers. For example, they tend to have equal or better grades in school than children whose parents were born in the United States. Psychologically, they also do quite well, showing similar levels of self-esteem as nonimmigrant children, although they do report feeling less popular and less in control of their lives (Harris, 2000; Kao, 2000; Driscoll, Russell, & Crockett, 2008).

On the other hand, many children of immigrants face challenges. Their parents often have limited education, and they work at jobs that pay poorly. Unemployment rates are often higher for immigrants than for the general population. In addition, parental English proficiency may be lower. Many children of immigrants lack good health insurance and access to health care may be limited (Hernandez et al., 2008; Turney & Kao, 2009).

Even the immigrant children who are not financially well off, however, are often more highly motivated to succeed and place greater value on education than do children in nonimmigrant families. Moreover, many immigrant children come from societies that emphasize collectivism, and consequently they may feel they have a greater obligation and duty to their family to succeed. Finally, their country of origin may give some immigrant children a strong enough cultural identity to prevent them from adopting undesirable "American" behaviors—such as materialism or selfishness (Fuligni & Yoshikawa, 2003; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008).

During the middle childhood years, it thus appears that children in immigrant families often do quite well in the United States. The story is less clear, however, when immigrant children reach adolescence and adulthood. For instance, some research shows higher rates of obesity (a key indicator of physical health) in immigrant adolescents. Research is just beginning to clarify how effectively immigrants cope over the course of the life span (Fuligni & Fuligni, 2008; Perreira & Ornelas, 2011; Fuligni, 2012).

Immigrant children tend to fare quite well in the United States, partly because many come from societies that emphasize collectivism, and consequently they may feel more obligation and duty to their family to succeed. What are some other cultural differences that can lead to the success of immigrant children?

Moral Development

LO 10.4 Describe how children's sense of right and wrong changes in middle childhood.

> *Your wife is near death from an unusual kind of cancer. One drug exists that the physicians think might save her—a form of radium that a scientist in a nearby city has recently developed. The drug, though, is expensive to manufacture, and the scientist is charging ten times what the drug costs him to make. He pays $1,000 for the radium and charges $10,000 for a small dose. You have gone to everyone you know to borrow money, but you can get together only $2,500—one-quarter of what you need. You've told the scientist that your wife is dying and asked him to sell it more cheaply or let you pay later. But the scientist has said, "No, I discovered the drug and I'm going to make money from it." In desperation, you consider breaking into the scientist's laboratory to steal the drug for your wife. Should you do it?*

According to developmental psychologist Lawrence Kohlberg and his colleagues, the answer that children give to this question reveals central aspects of their sense of morality and justice. He suggests that people's responses to moral dilemmas such as this one reveal the stage of moral development they have attained—as well as yield information about their general level of cognitive development (Kohlberg, 1984; Colby & Kohlberg, 1987).

Kohlberg contends that people pass through a series of stages as their sense of justice evolves and in the kind of reasoning they use to make moral judgments. Primarily because of the cognitive characteristics we discussed earlier, younger school-age children tend to think either in terms of concrete, unvarying rules ("It is always wrong to steal" or "I'll be punished if I steal") or in terms of the rules of society ("Good people don't steal" or "What if everyone stole?").

By the time they reach adolescence, however, individuals are able to reason on a higher plane, typically having reached Piaget's stage of formal operations. They are capable of comprehending abstract, formal principles of morality, and they consider cases such as the one just presented in terms of broader issues of morality and of right and wrong ("Stealing may be acceptable if you are following your own conscience and doing the right thing").

Kohlberg suggests that moral development emerges in a three-level sequence, which is further subdivided into six stages (see Table 10-1). At the lowest level, *preconventional morality* (Stages 1 and 2), people follow rigid rules based on punishments or rewards. For example, a student at the preconventional level might evaluate the moral dilemma posed in the story by saying that it was not worth stealing the drug because if you were caught, you would go to jail.

In the next level, that of *conventional morality* (Stages 3 and 4), people approach moral problems in terms of their own position as good, responsible members of society. Some at this level would decide *against* stealing the drug because they think they would feel guilty or dishonest for violating social norms. Others would decide *in favor* of stealing the drug because if they did nothing in this situation, they would be unable to face others. All of these people would be reasoning at the conventional level of morality.

Finally, individuals using *postconventional morality* (Level 3; Stages 5 and 6) invoke universal moral principles that are considered broader than the rules of the particular society in which they live. People who feel that they would condemn themselves if they did not steal the drug because they would not be living up to their own moral principles would be reasoning at the postconventional level.

Kohlberg's theory proposes that people move through the periods of moral development in a fixed order and that they are unable to reach the highest stage until adolescence, due to deficits in cognitive development that are not overcome until then (Kurtines & Gewirtz, 1987). However, not everyone is presumed to reach the highest stages: Kohlberg found that postconventional reasoning is relatively rare.

Table 10-1 Kohlberg's Sequence of Moral Reasoning

		SAMPLE MORAL REASONING	
Level	**Stage**	**In Favor of Stealing**	**Against Stealing**
LEVEL 1 **Preconventional morality** The main considerations are the avoidance of punishment and the desire for rewards.	**STAGE 1** Obedience and punishment orientation: People obey rules to avoid being punished. Obedience is its own reward.	"You shouldn't just let your wife die. People will blame you for not doing enough, and they'll blame the scientist for not selling you the drug for less money."	"You can't steal the drug because you'll be arrested and go to jail. Even if you aren't caught, you'll feel guilty and you'll always worry that the police may figure out what you did."
	STAGE 2 Reward orientation: People obey rules in order to earn rewards for their own benefit.	"Even if you get caught, the jury will understand and give you a short sentence. Meanwhile, your wife is alive. And if you're stopped before you get the drug to your wife, you could probably just return the drug without penalty."	"You shouldn't steal the drug because you're not responsible for your wife's cancer. If you get caught, your wife will still die and you'll be in jail."
LEVEL 2 **Conventional morality** Membership in society becomes important. People behave in ways that will win the approval of others.	**STAGE 3** "Good boy" morality: People want to be respected by others and try to do what they're supposed to do.	"Who will blame you if you steal a life-saving drug? But if you just let your wife die, you won't be able to hold your head up in front of your family or your neighbors."	"If you steal the drug, everyone will treat you like a criminal. They will wonder why you couldn't have found some other way to save your wife."
	STAGE 4 Authority and social-order-maintaining morality: People believe that only society, not individuals, can determine what is right. Obeying society's rules is right in itself.	"A husband has certain responsibilities toward his wife. If you want to live an honorable life, you can't let fear of the consequences get in the way of saving her. If you ever want to sleep again, you have to save her."	"You shouldn't let your concern for your wife cloud your judgment. Stealing the drug may feel right at the moment, but you'll live to regret breaking the law."
LEVEL 3 **Postconventional morality** People accept that there are certain ideals and principles of morality that must govern our actions. These ideals are more important than any particular society's rules.	**STAGE 5** Morality of contract, individual rights, and democratically accepted law: People rightly feel obligated to follow the agreed rules of society. But as societies develop over time, rules have to be updated to make societal changes reflect underlying social principles.	"If you simply follow the law, you will violate the underlying principle of saving your wife's life. If you do take the drug, society will understand your actions and respect them. You can't let an outdated law prevent you from doing the right thing."	"Rules represent society's thinking on the morality of actions. You can't let your short-term emotions interfere with the more permanent rules of society. If you do, society will judge you negatively, and in the end you will lose self-respect."
	STAGE 6 Morality of individual principles and conscience: People accept that laws are attempts to write down specific applications of universal moral principles. Individuals must test these laws against their consciences, which tend to express an inborn sense of those principles.	"If you allow your wife to die, you will have obeyed the letter of the law, but you will have violated the universal principle of life preservation that resides within your conscience. You will blame yourself forever if your wife dies because you obeyed an imperfect law."	"If you become a thief, your conscience will blame you for putting your own interpretation of moral issues above the legitimate rule of law. You will have betrayed your own standards of morality."

(**Source:** Based on Kohlberg, 1969.)

Although Kohlberg's theory provides a good account of the development of moral *judgments*, the links with moral *behavior* are less strong. Still, students at higher levels of moral reasoning are less likely to engage in antisocial behavior at school (such as breaking school rules) and in the community (such as engaging in juvenile delinquency) (Langford, 1995; Carpendale, 2000; Wu & Liu, 2014).

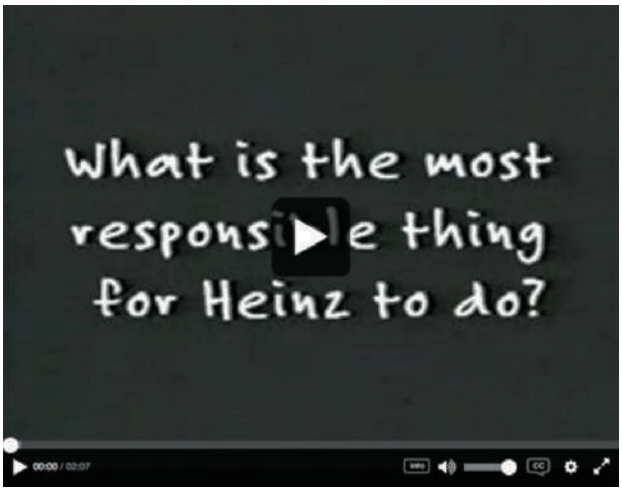
Furthermore, one experiment found that 15 percent of students who reasoned at the postconventional level of morality—the highest category—cheated when given the opportunity, although they were not as likely to cheat as those at lower levels, where more than half of the students cheated. Clearly, however, knowing what is morally right does not always mean acting in accordance (Snarey, 1995; Hart, Burock, & London, 2003; Semerci, 2006; Prohaska, 2012).

Kohlberg's theory has also been criticized because it is based solely on observations of members of Western cultures. Cross-cultural research finds that members of more industrialized, technologically advanced cultures move through the stages more rapidly than members of nonindustrialized countries. Why? One explanation is that Kohlberg's higher stages are based on moral reasoning involving governmental and so-

cietal institutions, such as the police and the court system. In less industrialized areas, morality may be based more on relationships between people in a particular village. In short, the nature of morality may differ in diverse cultures, and Kohlberg's theory is more suited for Western cultures (Fu et al., 2007).

An aspect of Kohlberg's theory that has proved even more problematic is the difficulty it has explaining *girls'* moral judgments. Because the theory initially was based largely on data from males, some researchers have argued that it does a better job describing boys' moral development than girls' moral development. This would explain the surprising finding that women typically score at a lower level than men on tests of moral judgments using Kohlberg's stage sequence. This result has led to an alternative account of moral development for girls.

WATCH THIS VIDEO ON MYPSYCHLAB
KOHLBERG AND THE HEINZ DILEMMA



MORAL DEVELOPMENT IN GIRLS. Psychologist Carol Gilligan (1982, 1987) has suggested that differences in the ways boys and girls are raised in our society lead to basic distinctions in how men and women view moral behavior. According to Gilligan, boys view morality primarily in terms of broad principles, such as justice or fairness, whereas girls see it in terms of responsibility toward individuals and willingness to sacrifice themselves to help specific individuals within the context of particular relationships. Compassion for individuals, then, is a more prominent factor in moral behavior for women than it is for men (Gilligan, Lyons, & Hammer, 1990; Gump, Baker, & Roll, 2000).

Gilligan views morality as developing among females in a three-stage process (summarized in Table 10-2). In the first stage, called "orientation toward individual survival," females first concentrate on what is practical and best for them, gradually making a transition from selfishness to responsibility, in which they think about what would be best for others. In the second stage, termed "goodness as self-sacrifice," females begin to think that they must sacrifice their own wishes to what other people want. Ideally, women make a transition from "goodness" to "truth," in which they take into account their own needs plus those of others. This transition leads to the third stage, "morality of nonviolence," in which women come to see that hurting anyone is immoral—including hurting themselves. This realization establishes a moral equivalence between themselves and others and represents, according to Gilligan, the most sophisticated level of moral reasoning.

It is obvious that Gilligan's sequence of stages is quite different from Kohlberg's, and some developmentalists have suggested that her rejection of Kohlberg's work is too sweeping and that gender differences are not as pronounced as first thought (Colby &

Table 10-2 Gilligan's Three Stages of Moral Development for Women

Stage	Characteristics	Example
Stage 1 Orientation toward individual survival	Initial concentration is on what is practical and best for self. Gradual transition from selfishness to responsibility, which includes thinking about what would be best for others.	A first grader may insist on playing only games of her own choosing when playing with a friend.
Stage 2 Goodness as self-sacrifice	Initial view is that a woman must sacrifice her own wishes to what other people want. Gradual transition from "goodness" to "truth," which takes into account needs of both self and others.	Now older, the same girl may believe that to be a good friend, she must play the games her friend chooses, even if she herself doesn't like them.
Stage 3 Morality of nonviolence	A moral equivalence is established between self and others. Hurting anyone—including one's self—is seen as immoral. Most sophisticated form of reasoning, according to Gilligan.	The same girl may realize that both friends must enjoy their time together and look for activities that both she and her friend can enjoy.

(**Source:** Gilligan, 1982.)

Damon, 1987). For instance, some researchers argue that both males and females use similar "justice" and "care" orientations in making moral judgments. Clearly, the question of how boys and girls differ in their moral orientations, as well as the nature of moral development in general, is far from settled (Weisz & Black, 2002; Jorgensen, 2006; Tappan, 2006; Donleavy, 2008).

Module 10.1 Review

- According to Erikson, children in the middle childhood years are in the industry-versus-inferiority stage.
- In the middle childhood years, children begin to use social comparison and self-concepts based on psychological rather than physical characteristics.
- During the middle childhood years, self-esteem is based on comparisons with others and internal standards of success; if self-esteem is low, the result can be a cycle of failure.
- According to Kohlberg, moral development proceeds from a concern with rewards and punishments, through a focus on social conventions and rules, toward a sense of universal moral principles. Gilligan has suggested, however, that girls may follow a somewhat different progression of moral development.

Journal Writing Prompt

Applying Lifespan Development: Kohlberg and Gilligan each suggest there are three major levels of moral development. Are any of their levels comparable? In which level of either theory do you think that the largest discrepancy between males and females would be observed?

Relationships: Building Friendship in Middle Childhood

> *In Lunch Room Number Two, Jamillah and her new classmates chew slowly on sandwiches and sip quietly on straws from cartons of milk… . Boys and girls look timidly at the strange faces across the table from them, looking for someone who might play with them in the schoolyard, someone who might become a friend.*
>
> *For these children, what happens in the schoolyard will be just as important as what happens in the school. And when they're out on the playground, there will be no one to protect them. No child will hold back to keep from beating them at a game, humiliating them in a test of skill, or harming them in a fight. No one will run interference or guarantee membership in a group. Out on the playground, it's sink or swim. No one automatically becomes your friend. (Kotre & Hall, 1990, pp. 112–113)*

As Jamillah and her classmates demonstrate, friendship comes to play an increasingly important role during middle childhood. Children grow progressively more sensitive to the importance of friends, and building and maintaining friendships becomes a large part of children's social lives.

Friends influence children's development in several ways. For instance, friendships provide children with information about the world and other people as well as about themselves. Friends provide emotional support that allows children to respond more effectively to stress. Having friends makes a child less likely to be the target of aggression, and it can teach children how to manage and control their emotions and help them interpret their own emotional experiences (Berndt, 2002; Lundby, 2013).

Friendships in middle childhood also provide a training ground for communicating and interacting with others. They can also foster intellectual growth by increasing children's range of experiences (Nangle & Erdley, 2001; Gifford-Smith & Brownell, 2003; Majors, 2012).

Although friends and other peers become increasingly influential throughout middle childhood, they are not more important than parents and other family members. Most developmentalists believe that children's psychological functioning and their development in general is the product of a combination of factors, including peers and parents (Vandell, 2000; Parke, Simpkins, & McDowell, 2002; Laghi et al., 2014). For that reason, we'll talk more about the influence of family later in this chapter.

Stages of Friendship: Changing Views of Friends

LO 10.5 Describe the sorts of relationships and friendships that are typical of middle childhood.

During middle childhood, a child's conception of the nature of friendship undergoes some profound changes. According to developmental psychologist William Damon, a child's view of friendship passes through three distinct stages (Damon & Hart, 1988).

STAGE 1: BASING FRIENDSHIP ON OTHERS' BEHAVIOR. In the first stage, which ranges from around four to seven years of age, children see friends as others who like them and with whom they share toys and other activities. They view the children with whom they spend the most time as their friends. For instance, a kindergartner who was asked, "How do you know that someone is your best friend?" responded in this way:

> *I sleep over at his house sometimes. When he's playing ball with his friends he'll let me play. When I slept over, he let me get in front of him in 4-squares. He likes me. (Damon, 1983, p. 140)*

What children in this first stage don't do much of, however, is to take others' personal qualities into consideration. For instance, they don't see their friendships as being based on their peers' unique positive personal traits. Instead, they use a very concrete approach to deciding who is a friend, primarily dependent on others' behavior. They like those who share and with whom they can share, while they don't like those who don't share, who hit, or who don't play with them. In sum, in the first stage, friends are viewed largely in terms of presenting opportunities for pleasant interactions.

STAGE 2: BASING FRIENDSHIP ON TRUST. In the next stage, however, children's view of friendship becomes more complicated. Lasting from around age 8 to age 10, this stage covers a period in which children take others' personal qualities and traits as well as the rewards they provide into consideration. But the centerpiece of friendship in this second stage is mutual trust. Friends are seen as those who can be counted on to help out when they are needed. This means that violations of trust are taken very seriously, and friends cannot make amends for such violations just by engaging in positive play, as they might at earlier ages. Instead, the expectation is that formal explanations and formal apologies must be provided before a friendship can be reestablished.

Mutual trust is considered to be the centerpiece of friendship during middle childhood.

STAGE 3: BASING FRIENDSHIP ON PSYCHOLOGICAL CLOSENESS. The third stage of friendship begins toward the end of middle childhood, from 11 to 15 years of age. During this period, children begin to develop the view of friendship that they hold during adolescence. Although we'll discuss this perspective in detail in Chapter 12, the main criteria for friendship shift toward intimacy and loyalty. Friendship at this stage is characterized by feelings of closeness, usually brought on by sharing personal thoughts and feelings through mutual disclosure. They are also somewhat exclusive. By the time they reach the end of middle childhood, children seek out friends who will be

Table 10-3 The Most-Liked and Least-Liked Behaviors That Children Note in Their Friends, in Order of Importance

Most-Liked Behaviors	Least-Liked Behaviors
Having a sense of humor	Verbal aggression
Being nice or friendly	Expressions of anger
Being helpful	Dishonesty
Being complimentary	Being critical or criticizing
Inviting one to participate in games, etc.	Being greedy or bossy
Sharing	Physical aggression
Avoiding unpleasant behavior	Being annoying or bothersome
Giving one permission or control	Teasing
Providing instructions	Interfering with achievements
Loyalty	Unfaithfulness
Performing admirably	Violating of rules
Facilitating achievements	Ignoring others

(**Source:** Adapted from Zarbatany, Hartmann, & Rankin, 1990.)

loyal, and they come to view friendship not so much in terms of shared activities as in terms of the psychological benefits that friendship brings.

Children also develop clear ideas about which behaviors they seek in their friends—and which they dislike. As can be seen in Table 10-3, fifth and sixth graders most enjoy others who invite them to participate in activities and who are helpful, both physically and psychologically. In contrast, displays of physical or verbal aggression, among other behaviors, are disliked.

Individual Differences in Friendship: What Makes a Child Popular?

LO 10.6 Describe what makes a child popular and why it is important in middle childhood.

status
the evaluation of a role or person by other relevant members of a group

A variety of factors lead some children to be unpopular and socially isolated from their peers.

Why is it that some children are the schoolyard equivalent of the life of the party, while others are social isolates whose overtures toward their peers are dismissed or disdained?

Developmentalists have attempted to answer this question by examining individual differences in popularity, seeking to identify the reasons why some children climb the ladder of popularity while others remain firmly on the ground.

STATUS AMONG SCHOOL-AGE CHILDREN: ESTABLISHING ONE'S POSITION. Who's on top? Although school-age children are not likely to articulate such a question, the reality of children's friendships is that they exhibit clear hierarchies in terms of status. **Status** is the evaluation of a role or person by other relevant members of a group. Children who have higher status have greater access to available resources, such as games, toys, books, and information. In contrast, lower-status children are more likely to follow the lead of children of higher status.

Status can be measured in several ways. Most frequently, children are asked directly how much they like or dislike particular classmates. They may also be asked whom they would most (and least) like to play with or to carry out some task with.

Status is an important determinant of children's friendships. High-status children tend to form friendships with higher-status individuals, while lower-status children are more likely to have friends of lower status. Status is also related to the number of friends a child has: Higher-status children are more apt to have a greater number of friends than lower-status children.

But it is not only the quantity of social interactions that separates high-status children from lower-status children; the nature of their interactions is also

different. Higher-status children are more likely to be viewed as friends by other children. They are more likely to form cliques, groups that are viewed as exclusive and desirable, and they tend to interact with a greater number of other children. In contrast, children of lower status are more likely to play with younger or less popular children (Ladd, 1983).

In short, popularity is a reflection of children's status. School-age children who are mid to high in status are more likely to initiate and coordinate joint social behavior, making their general level of social activity higher than that of children low in social status (Erwin, 1993).

WHAT PERSONAL CHARACTERISTICS LEAD TO POPULARITY? Popular children share several personality characteristics. They are usually helpful, cooperating with others on joint projects. Popular children are also funny, tending to have good senses of humor and to appreciate others' attempts at humor. Compared with children who are less popular, they are better able to read others' nonverbal behavior and understand others' emotional experiences. They can also control their nonverbal behavior more effectively, thereby presenting themselves well. In short, popular children are high in **social competence**, the collection of individual social skills that permits individuals to perform successfully in social settings (Feldman, Tomasian, & Coats, 1999).

social competence
the collection of social skills that permits individuals to perform successfully in social settings

Although, generally, popular children are friendly, open, and cooperative, one subset of popular boys displays an array of negative behaviors, including being aggressive, disruptive, and causing trouble. Despite these behaviors, they may be viewed as cool and tough by their peers, and they are often remarkably popular. This popularity may occur in part because they are seen as boldly breaking rules that others feel constrained to follow (Woods, 2009; Schonert-Reichl, Smith, Zaidman-Zait, & Hertzman, 2012; Scharf, 2014).

SOCIAL PROBLEM-SOLVING ABILITIES. Another factor that relates to children's popularity is their skill at social problem solving. **Social problem solving** refers to the use of strategies for solving social conflicts in ways that are satisfactory both to oneself and to others. Because social conflicts among school-age children are a frequent occurrence—even among the best of friends—successful strategies for dealing with them are an important element of social success (Murphy & Eisenberg, 2002; Dereli-Iman, 2013).

social problem solving
the use of strategies for solving social conflicts in ways that are satisfactory both to oneself and to others

According to developmental psychologist Kenneth Dodge, successful social problem solving proceeds through a series of steps that correspond to children's information processing strategies (see Figure 10-3). Dodge argues that the manner in which children solve social problems is a consequence of the decisions they make at each point in the sequence (Dodge, Lansford, & Burks, 2003; Lansford et al., 2006).

By carefully delineating each of the stages, Dodge provides a means by which interventions can be targeted toward a specific child's deficits. For instance, some children routinely misinterpret the meaning of other children's behavior (Step 2) and then respond according to their misinterpretation.

Suppose Max, a fourth grader, is playing a game with Will. While playing the game, Will begins to get angry because he is losing and complains about the rules. If Max is not able to understand that much of Will's anger is frustration at not winning, he is likely to react in an angry way himself, defending the rules, criticizing Will, and making the situation worse. If Max interprets the source of Will's anger more accurately, Max may be able to behave in a more effective manner, perhaps by reminding Will, "Hey, you beat me at Connect Four," thereby defusing the situation.

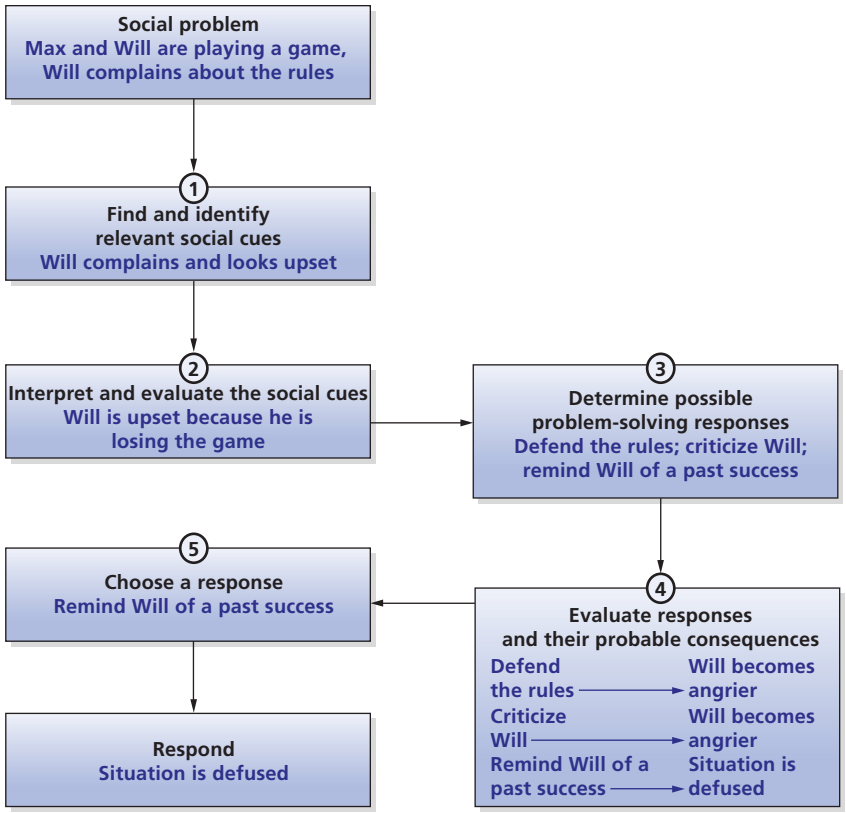
Generally, children who are popular are better at interpreting the meaning of others' behavior accurately. Furthermore, they possess a wider inventory of techniques for dealing with social problems. In contrast, less popular children tend to be less effective at understanding the causes of others' behavior, and as a result their reactions to others may be inappropriate. In addition, their strategies for dealing with social problems are more limited; they sometimes simply don't know how to apologize or help someone who is unhappy feel better (Rose & Asher, 1999; Rinaldi, 2002; Lahat et al., 2014).

Unpopular children may become victims of a phenomenon known as *learned helplessness*. Because they don't understand the root causes of their unpopularity, children may feel

Figure 10-3 Problem-Solving Steps

Children's problem solving proceeds through several steps involving different information processing strategies.

(**Source:** Based on Dodge, 1985.)



that they have little or no ability to improve their situation. As a result, they may simply give up and not even try to become more involved with their peers. In turn, their learned helplessness becomes a self-fulfilling prophecy, reducing the chances that they will become more popular in the future (Seligman, 2007; Aujoulat, Luminet, & Deccache, 2007).

TEACHING SOCIAL COMPETENCE. Can anything be done to help unpopular children learn social competence? Happily, the answer appears to be yes. Several programs have been developed to teach children a set of social skills that seem to underlie general social competence. For example, in one experimental program, a group of unpopular fifth and sixth graders was taught how to hold a conversation with friends. They were taught ways to disclose material about themselves, to learn about others by asking questions, and to offer help and suggestions to others in a nonthreatening way.

Compared with a group of children who did not receive such training, the children who were in the experiment interacted more with their peers, held more conversations, developed higher self-esteem, and—most critically—were more accepted by their peers than before training (Asher & Rose, 1997; Bierman, 2004). (For more on increasing children's social competence, see the *Are You an Informed Consumer of Development*? feature.)

SCHOOLYARD—AND CYBER-YARD—BULLIES

Austin Rodriguez, an Ohio teen, attempted suicide after classmates bullied him for being gay. They reportedly hid his gym clothes and tried to prevent him from entering the locker room or the lunchroom. They made nasty remarks on the Internet.

Rachel Ehmke, a Minnesota seventh grader, hung herself when the bullying got too awful to live with. The 13-year-old had been hounded for months by a group of girls who called her "prostitute," scrawled "slut" all over her notebook, and harassed her online.

Are You an Informed Consumer of Development?

Increasing Children's Social Competence

Building and maintaining friendships is critical in children's lives. Is there anything that parents and teachers can do to increase children's social competence?

The answer is a clear yes. Among the strategies that can work are the following:

- Encourage social interaction. Teachers can devise ways in which children are led to take part in group activities, and parents can encourage membership in such groups as Brownies and Cub Scouts or participation in team sports.
- Teach listening skills to children. Show them how to listen carefully and respond to the underlying meaning of a communication as well as its overt content.
- Make children aware that people display emotions and moods nonverbally and that consequently they should pay attention to others' nonverbal behavior, not just to what they are saying on a verbal level.
- Teach conversational skills, including the importance of asking questions and self-disclosure. Encourage students to use "I" statements in which they clarify their own feelings or opinions and avoid to making generalizations about others.
- Don't ask children to choose teams or groups publicly. Instead, assign children randomly: It works just as well in ensuring a distribution of abilities across groups and avoids the public embarrassment of a situation in which some children are chosen last.

Austin and Rachel are not alone in facing the torment of bullying, whether it comes at school or online. Almost 85 percent of girls and 80 percent of boys report experiencing some form of harassment in school at least once, and 160,000 U.S. schoolchildren stay home from school each day because they are afraid of being bullied. Others encounter bullying online, which may be even more painful because often the bullying is done anonymously or may involve public postings (Smith et al., 2008; Mishna, Saini, & Solomon, 2009; Law et al., 2012).

Those children who experience frequent bullying are most often loners who are fairly passive. They often cry easily, and they tend to lack the social skill that might otherwise defuse a bullying situation. For example, they are unable to think of humorous comebacks to bullies' taunts. But though children such as these are more likely to be bullied, even children without these characteristics occasionally are bullied during their school careers: Some 90 percent of middle school students report being bullied at some point in their time at school, beginning as early as the preschool years (Li, 2007; Katzer, Fetchenhauer, & Belschak, 2009; Lapidot-Lefler & Dolev-Cohen, 2014).

About 10 to 15 percent of students bully others at one time or another. About half of all bullies come from abusive homes—meaning, of course, that half don't. They tend to watch more television containing violence, and they misbehave more at home and at school than do nonbullies. When their bullying gets them into trouble, they may try to lie their way out of the situation, and they show little remorse for their victimization of others. Furthermore, bullies, compared with their peers, are more likely to break the law as adults. Although bullies are sometimes popular among their peers, some ironically themselves become victims of bullying (Ireland & Archer, 2004; Barboza et al., 2009; Reijntjes et al., 2014).

One of the most effective ways to reduce the incidence of bullying is through school programs that enlist and involve students. For example, schools can train students to intervene when they see an instance of bullying, rather than watching passively. Empowering students to stand up for victims has been shown to reduce bullying significantly (Storey et al., 2008; Munsey, 2012).

How can children in middle childhood deal with bullying? Among the strategies experts suggest are refusing to engage when provocations occur, speaking up against bullying (saying something such as "stop it"), and talking with parents, teachers, and

WATCH THIS VIDEO ON MYPSYCHLAB BULLYING

other trusted adults to get their help. Ultimately, children need to recognize that one has the right *not* to be bullied. (The U.S. government Web site, StopBullying.gov, provides extensive information about bullying; NCB Now, 2011; Saarento, Boulton, & Salmivalli, 2014.)

Gender and Friendships: The Sex Segregation of Middle Childhood

LO 10.7 Describe how gender affects friendships in middle childhood.

Girls rule; boys drool.

Boys are idiots. Girls have cooties.

Boys go to college to get more knowledge; girls go to Jupiter to get more stupider.

At least, those are some of the views of boys and girls regarding members of the other sex during the elementary school years. Avoidance of the other sex becomes quite pronounced during those years, to the degree that the social networks of most boys and girls consist almost entirely of same-sex groupings (Mehta & Strough, 2009; Rancourt et al., 2012; Zosuls et al., 2014).

Interestingly, the segregation of friendships according to gender occurs in almost all societies. In nonindustrialized societies, same-gender segregation may be the result of the types of activities that children engage in. For instance, in many cultures, boys are assigned one type of chore and girls another (Whiting & Edwards, 1988). Participation in different activities may not provide the whole explanation for sex segregation, however: Even children in more developed countries, who attend the same schools and participate in many of the same activities, still tend to avoid members of the other gender.

When boys and girls make occasional forays into the other gender's territory, the action often has romantic overtones. For instance, girls may threaten to kiss a boy, or boys might try to lure girls into chasing them. Such behavior, termed "border work," helps to emphasize the clear boundaries that exist between the two sexes. In addition, it may pave the way for future interactions that do involve romantic or sexual interests, when school-age children reach adolescence and cross-sex interactions become more socially endorsed (Beal, 1994).

dominance hierarchy
rankings that represent the relative social power of those in a group

The lack of cross-gender interaction in the middle childhood years means that boys' and girls' friendships are restricted to members of their own sex. Furthermore, the nature of friendships within these two groups is quite different (Lansford & Parker, 1999; Rose, 2002).

Though same-sex groupings dominate in middle childhood, when boys and girls do make occasional forays into each others' territory, there are often romantic overtones. Such behavior has been termed *border work*.

Boys typically have larger networks of friends than girls, and they tend to play in groups rather than pairing off. Differences in status within the group are usually quite pronounced, with an acknowledged leader and members falling into particular levels of status. Because of the fairly rigid rankings that represent the relative social power of those in the group, known as the **dominance hierarchy**, members of higher status can safely question and oppose children lower in the hierarchy (Beal, 1994; Pedersen et al., 2007).

Boys tend to be concerned with their place in the dominance hierarchy, and they attempt to maintain their status and improve upon it. This makes for a style of play known as *restrictive*. In restrictive play, interactions are interrupted when a child feels that his status is challenged. Thus, a boy who feels that he is unjustly challenged by a peer of lower status

may attempt to end the interaction by scuffling over a toy or otherwise behaving assertively. Consequently, boys' play tends to come in bursts, rather than in more extended, tranquil episodes (Benenson & Apostoleris, 1993; Estell et al., 2008).

The language of friendship used among boys reflects their concern over status and challenge. For instance, consider this conversation between two boys who were good friends:

CHILD 1: Why don't you get out of my yard?
CHILD 2: Why don't you *make* me get out of the yard?
CHILD 1: I *know* you don't want that.
CHILD 2: You're not gonna make me get out the yard cuz you can't.
CHILD 1: Don't force me.
CHILD 2: You can't. Don't force me to hurt you (*snickers*). (Goodwin, 1990, p. 37)

WATCH THIS VIDEO ON MYPSYCHLAB
FRIENDSHIP AND PLAY IN MIDDLE CHILDHOOD ACROSS CULTURES

Friendship patterns among girls are quite different. Rather than having a wide network of friends, school-age girls focus on one or two "best friends" who are of relatively equal status. In contrast to boys, who seek out status differences, girls profess to avoid differences in status, preferring to maintain friendships at equal-status levels.

Conflicts among school-age girls are usually solved through compromise, by ignoring the situation, or by giving in, rather than by seeking to make one's own point of view prevail. In sum, the goal is to smooth over disagreements, making social interaction easy and nonconfrontational (Noakes & Rinaldi, 2006).

The motivation of girls to solve social conflict indirectly does not stem from a lack of self-confidence or from apprehension over the use of more direct approaches. Actually, when school-age girls interact with other girls who are not considered friends or with boys, they can be quite confrontational. However, among friends their goal is to maintain equal-status relationships—relationships lacking a dominance hierarchy (Beale, 1994; Zahn-Waxler et al., 2008).

The language used by girls tends to reflect their view of relationships. Rather than blatant demands ("Give me the pencil"), girls are more apt to use language that is less confrontational and directive. Girls tend to use indirect forms of verbs, such as "Let's go to the movies" or "Would you want to trade books with me?" rather than "I want to go to the movies" or "Let me have these books" (Goodwin, 1990; Besag, 2006).

Cross-Race Friendships: Integration In and Out of the Classroom

LO 10.8 Describe how friendships between the races change during the school years.

Are friendships color-blind? For the most part, the answer is no. Children's closest friendships tend largely to be with others of the same race. As children age, there is a decline in the number and depth of friendships outside their own racial group. By the time they are 11 or 12, it appears that African American children become particularly aware of and sensitive to the prejudice and discrimination directed toward members of their race. At that point, they are more likely to make distinctions between members of ingroups (groups to which people feel they belong) and members of outgroups (groups to which people do not perceive membership) (Aboud & Sankar, 2007; Rowley et al., 2008; McDonald et al., 2013; Bagci et al., 2014).

For instance, when third graders from one long-integrated school were asked to name a best friend, around one-quarter of white children and two-thirds of African American children chose a child of the other race. In contrast, by the time they reached

As children age, there is a decline in the number of and depth of friendships outside their own racial group. What are some ways in which schools can foster mutual acceptance?

tenth grade, less than 10 percent of whites and 5 percent of African Americans named a different-race best friend (Asher, Singleton, & Taylor, 1982; McGlothlin & Killen, 2005; Rodkin & Ryan, 2012).

From *a social worker's* perspective

How might it be possible to decrease the segregation of friendships along racial lines? What factors would have to change in individuals or in society?

On the other hand, although they may not choose each other as best friends, whites and African Americans—as well as members of other minority groups—can show a high degree of mutual acceptance. This pattern is particularly true in schools with ongoing integration efforts. This makes sense: A good deal of research supports the notion that contact between majority and minority group members can reduce prejudice and discrimination (Hewstone, 2003; Quintana, 2008).

Module 10.2 Review

- Children's understanding of friendship changes from the sharing of enjoyable activities, through the consideration of personal traits that can meet their needs, to a focus on intimacy and loyalty.
- Friendships in childhood display status hierarchies. Social competence and social problem-solving skills contribute toward a child's popularity. Many children, especially loners, are the victims of bullies during their school years. Programs that involve students in intervening in bullying acts are most effective in reducing its incidence.
- Boys and girls engage increasingly in same-sex friendships, with boys' friendships involving group relationships and girls' friendships characterized by pairings of girls with equal status.
- Interracial friendships decrease in frequency as children age, but contact as peers among members of different races can promote mutual acceptance and appreciation.

Journal Writing Prompt

Applying Lifespan Development: Do you think the stages of friendship are a childhood phenomenon, or do adults' friendships display similar stages?

Family and School: Shaping Children's Behavior in Middle Childhood

Tamara's mother, Brenda, waited outside the door of her daughter's second-grade classroom for the end of the school day. Tamara came over to greet her mother as soon as she spotted her. "Mom, can Anna come over to play today?" Tamara demanded. Brenda had been looking forward to spending some time alone with Tamara, who had spent the last three days at her dad's house. But, Brenda reflected, Tamara hardly ever got to ask kids over after school, so she agreed to the request. Unfortunately, it turned out today wouldn't work for Anna's family, so they tried to find an alternate date. "How about Thursday?" Anna's mother suggested. Before Tamara could reply, her mother reminded her, "You'll have to ask your dad. You're at his house that night." Tamara's expectant face fell. "OK," she mumbled.

How will Tamara's adjustment be affected from dividing her time between the two homes where she lives with her divorced parents? What about the adjustment of her friend, Anna, who lives with both her parents, both of whom work outside the home? These are just a few of the questions we need to consider as we look at the ways that children's schooling and home life affect their lives during middle childhood.

Families: The Changing Home Environment

LO 10.9 Summarize how today's diverse family and care arrangements affect children in middle childhood.

Ms. Herald's first-graders are making family trees to honor the diversity of the children's families. And what diversity there is! Paul has two dads. Jorge's mom remarried after her divorce and his new dad came with two daughters. Mary's dad died. Now she has a mom and twin brothers. Demetri lives with his grandparents and his aunt and her son. Beth lives with her dad and his girlfriend. The girlfriend is pregnant, so Beth writes "Baby???" on her tree. And Jonas lives in a foster home: two moms, three kids.

We've noted in earlier chapters that changes have occurred in the structure of the family over the last few decades. With an increase in the number of parents who both work outside of the home, a soaring divorce rate, and a rise in single-parent families, the environment faced by children passing through middle childhood in the twenty-first century is very different from that faced by prior generations.

One of the biggest challenges facing children and their parents is the increasing independence that characterizes children's behavior during middle childhood. During the period, children move from being almost completely controlled by their parents to increasingly controlling their own destinies—or at least their everyday conduct. Middle childhood, then, is a period of **coregulation** in which children and parents jointly control behavior. Increasingly, parents provide broad, general guidelines for conduct, while children have control over their everyday behavior. For instance, parents may urge their daughter to buy a balanced, nutritious school lunch each day, but their daughter's decision to regularly buy pizza and two desserts is very much her own.

coregulation
a period in which parents and children jointly control children's behavior

FAMILY LIFE: STILL IMPORTANT AFTER ALL THESE YEARS. During the middle years of childhood, children spend significantly less time with their parents. Still, parents remain the major influence in their children's lives, and they are seen as providing essential assistance, advice, and direction (Parke, 2004).

Siblings also have an important influence on children during middle childhood, for good and for bad. Although brothers and sisters can provide support, companionship, and a sense of security, they can also be a source of strife.

Sibling rivalry can occur, with siblings competing or quarreling with one another. Such rivalry can be most intense when siblings are similar in age and of the same sex. Parents may intensify sibling rivalry by being perceived as favoring one child over another. Such perceptions may or may not be accurate. For example, older siblings may be permitted more freedom, which the younger sibling may interpret as favoritism. In some cases, perceived favoritism not only leads to sibling rivalry but may also damage the self-esteem of the younger sibling. On the other hand, sibling rivalry is not inevitable, and many siblings get along with each other quite well (McHale, Updegraff, & Whiteman, 2012; Edward, 2013; Skrzypek, Maciejewska-Sobczak & Stadnicka-Dmitriew, 2014).

Cultural differences are linked to sibling experiences. For example, in Mexican-American families, which have particularly strong values regarding the importance of family, siblings are less likely to respond negatively when younger siblings receive preferential treatment (McHale et al., 2005; McGuire & Shanahan, 2010).

What about children who have no siblings? The only child has no opportunity to develop sibling rivalry but also misses out on the benefits that siblings can bring. Generally, despite the stereotype that only children are spoiled and self-centered, the reality is that they are as well adjusted as children with brothers and sisters. In some ways, only children are better adjusted, often having higher self-esteem and stronger motivation to achieve. This is particularly good news for parents in the People's Republic of China, where a strict one-child policy is in effect. Studies there show that Chinese only-children often academically outperform children with siblings (Jiao, Ji, & Jing, 1996; Miao & Wang, 2003).

WHEN BOTH PARENTS WORK OUTSIDE THE HOME: HOW DO CHILDREN FARE? In most cases, children whose parents both work full time outside of the home fare quite well. Children whose parents are loving, are sensitive to their children's needs, and provide appropriate substitute care typically develop no differently from children in families in which one of the parents does not work (Harvey, 1999).

The good adjustment of children whose mothers and fathers both work relates to the psychological adjustment of the parents, especially mothers. In general, women who are satisfied with their lives tend to be more nurturing with their children. When work provides a high level of satisfaction, then, mothers who work outside of the home may be more psychologically supportive of their children. Thus, it is not so much a question of whether a mother chooses to work full time, to stay at home, or to arrange some combination of the two. What matters is how satisfied she is with the choices she has made (Haddock & Rattenborg, 2003; Heinrich 2014).

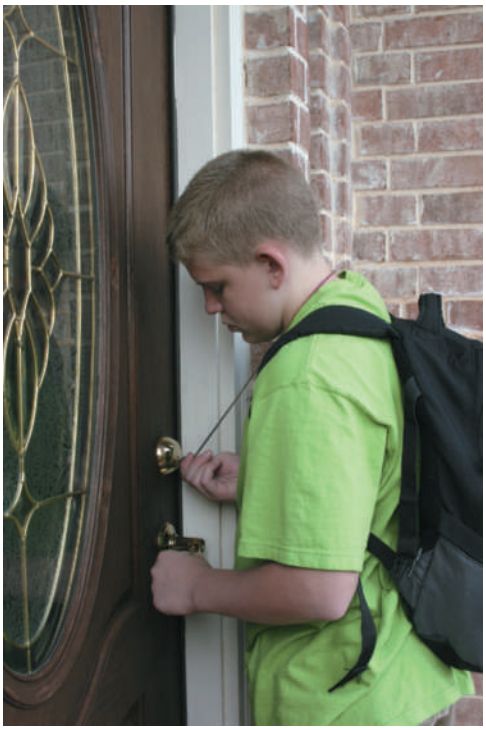
Although we might expect that children whose parents both work would spend comparatively less time with their parents than children with one parent at home full time, research suggests otherwise. Children with mothers and fathers who work full time spend essentially the same amount of time with family, with friends in class, and alone as children in families where one parent stays at home (Gottfried, Gottfried, & Bathurst, 2002).

HOME AND ALONE: WHAT DO CHILDREN DO?

When 10-year-old Johnetta Colvin comes home after finishing a day at Martin Luther King Elementary School, the first thing she does is grab a few cookies and turn on the computer. She takes a quick look at her e-mail and then goes over to the television and typically spends the next hour watching. During commercials, she takes a look at her homework. What she doesn't do is chat with her parents, neither of whom is there. She's home alone.

self-care children
children who let themselves into their homes after school and wait alone until their caretakers return from work; previously known as *latchkey children*

Johnetta is a **self-care child**, the term for children who let themselves into their homes after school and wait alone until their parents return from work. Some 12 to 14 percent of children in the United States between the ages of 5 and 12 spend some time alone after school, without adult supervision (Lamorey et al., 1998; Berger, 2000).



The consequences of being a self-care child are not necessarily harmful, and they may even lead to a greater sense of independence and competence.

In the past, concern about self-care children centered on their lack of supervision and the emotional costs of being alone. Such children were previously called *latchkey children*, evoking images of sad, pathetic, and neglected children. However, a new view of self-care children is emerging. According to sociologist Sandra Hofferth, given the hectic schedule of many children's lives, a few hours alone may provide a helpful period of decompression. Furthermore, it may give children the opportunity to develop a greater sense of autonomy (Hofferth & Sandberg, 2001).

Research has identified few differences between self-care children and children who return to homes with parents. Although some children report negative experiences while at home by themselves (such as loneliness), they do not seem emotionally damaged by the experience. In addition, if they stay at home by themselves rather than "hanging out" unsupervised with friends, they may avoid involvement in activities that can lead to difficulties (Long & Long, 1983; Belle, 1999; Goyette-Ewing, 2000).

In sum, the consequences of being a self-care child are not necessarily harmful. In fact, children may develop an enhanced sense of independence and competence. Furthermore, the time spent alone provides an opportunity to work uninterrupted on homework and school or personal projects. Children with employed parents may have higher self-esteem because they feel they are contributing to the household in significant ways (Goyette-Ewing, 2000).

DIVORCE. Having divorced parents, like Tamara, the second-grader who was described earlier, is no longer very distinctive. Only around half the children in the United States spend their entire childhoods living in the same household

with both their parents. The rest will live in single-parent homes or with stepparents, grandparents, or other nonparental relatives; and some will end up in foster care (Harvey & Fine, 2004).

How do children react to divorce? The answer depends on how soon you ask the question following a divorce as well as how old the children are at the time of the divorce. Immediately after a divorce, both children and parents may show several types of psychological maladjustment for a period that may last from 6 months to 2 years. For instance, children may be anxious, experience depression, or show sleep disturbances and phobias. Even though children most often live with their mothers following a divorce, the quality of the mother–child relationship declines in the majority of cases, often because children see themselves as caught in the middle between their mothers and fathers (Lansford, 2009; Maes, De Mol, & Buysse, 2012; Weaver & Schofield, 2015).

From *a health-care worker's* perspective

How might the development of self-esteem in middle childhood be affected by a divorce? Can constant hostility and tension between parents lead to a child's health problems?

During the early stage of middle childhood, children whose parents are divorcing often blame themselves for the breakup. By the age of 10, children feel pressure to choose sides, taking the position of either the mother or the father. As a result, they experience some degree of divided loyalty (Shaw, Winslow, & Flanagan, 1999).

Although researchers agree that the short-term consequences of divorce can be quite difficult, the longer-term effects are less clear. Some studies have found that 18 months to 2 years later, most children begin to return to their predivorce state of psychological adjustment. For many children, there are minimal long-term consequences (Hetherington & Kelly, 2002; Guttmann & Rosenberg, 2003; Harvey & Fine, 2004).

Other evidence, however, suggests that the fallout from divorce lingers. For example, twice as many children of divorced parents enter psychological counseling as children from intact families (although sometimes a judge will mandate counseling as part of the divorce). In addition, people who have experienced parental divorce are more at risk for experiencing divorce themselves later in life (Huurre, Junkkari, & Aro, 2006; Uphold-Carrier & Utz, 2012; South, 2013).

How children react to divorce depends on several factors. One is the economic standing of the family the child is living with. In many cases, divorce brings a decline in both parents' standards of living. When this occurs, children may be thrown into poverty (Ozawa & Yoon, 2003; Fischer, 2007).

In other cases, the negative consequences of divorce are less severe because the divorce reduces the hostility and anger in the home. If the household before the divorce was overwhelmed by parental strife—as is the case in around 30 percent of divorces—the greater calm of a postdivorce household may be beneficial to children. This is particularly true for children who maintain a close, positive relationship with the parent with whom they do not live (Davies et al., 2002).

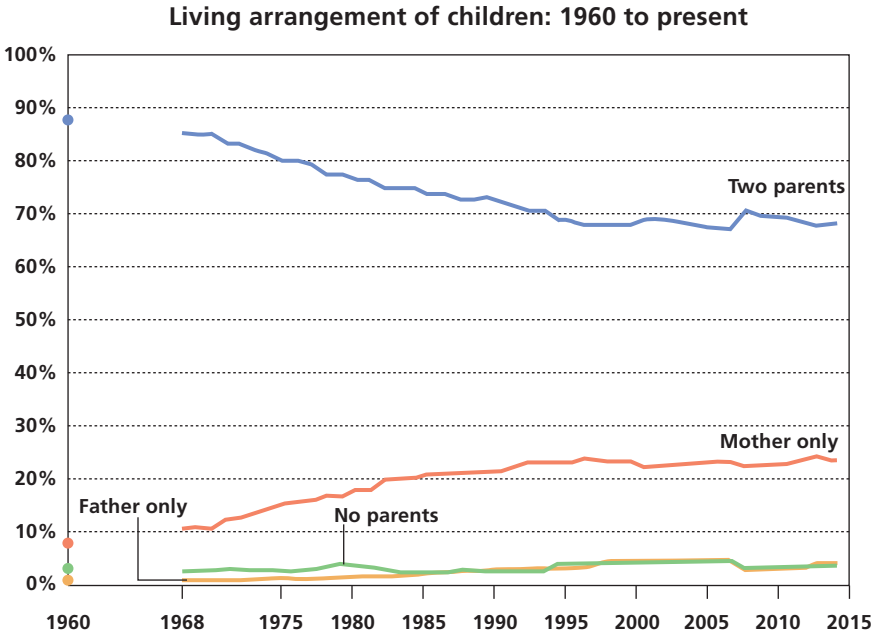
For some children, then, divorce is an improvement over living with parents who have an intact but unhappy marriage, high in conflict. But in about 70 percent of divorces, the predivorce level of conflict is not high, and children in these households may have a more difficult time adjusting to divorce (Amato & Booth, 1997).

SINGLE-PARENT FAMILIES. Almost one-quarter of all children under the age of 18 in the United States live with only one parent. If present trends continue, almost three-quarters of American children will spend some portion of their lives in a single-parent family before they are 18 years old. For minority children, the numbers are even higher: Almost 60 percent of African American children and 35 percent of Hispanic children

Figure 10-4 Living Arrangements of Children: 1960 to Present

Although the number of children living with single parents increased dramatically for several decades, it has leveled off in recent years.

(**Sources:** U.S. Census Bureau Decennial Census, 1960, and Current Population Survey, Annual Social and Economic Supplements, 1968–2014.)



under the age of 18 live in single-parent homes (U.S. Bureau of the Census, 2000; see Figure 10-4).

In rare cases, death is the reason for single parenthood. More frequently, either no spouse was ever present (i.e., the mother never married), the parents have divorced, or the spouse is absent. In the vast majority of cases, the single parent who is present is the mother.

What consequences are there for children living in homes with just one parent? This is a difficult question to answer. Much depends on whether a second parent was present earlier and the nature of the parents' relationship at that time. Furthermore, the economic status of the single-parent family plays a role in determining the consequences for children. Single-parent families are often less well-off financially than two-parent families, and living in relative poverty has a negative impact on children (Davis, 2003; Harvey & Fine, 2004; Nicholson et al., 2014).

In sum, the impact of living in a single-parent family is not, by itself, invariably negative or positive. Given the large number of single-parent households, the stigma that was once attached to such families has largely declined. The ultimate consequences for children depend on a variety of factors that accompany single parenthood, such as the economic status of the family, the amount of time that the parent is able to spend with the child, and the degree of stress in the household.

MULTIGENERATIONAL FAMILIES. Some households consist of several generations, in which children, parents, and grandparents live together. The presence of multiple generations in the same house can make for a rich living experience for children, who experience the influence both of their parents and grandparents. At the same time, multigenerational families also have the potential for conflict, with several adults acting as disciplinarians without coordinating what they do.

The prevalence of three-generation families who live together is greater among African Americans than among Caucasians. In addition, African American families, which are more likely than white families to be headed by single parents, often rely substantially on the help of grandparents in everyday child care, and cultural norms tend to be highly supportive of grandparents taking an active role (Oberlander, Black, & Starr, 2007; Pittman & Boswell, 2007; Kelch-Oliver, 2008).

LIVING IN BLENDED FAMILIES. For many children, the aftermath of divorce includes the subsequent remarriage of one or both parents. More than 10 million households in the United States contain at least one spouse who has remarried. More than 5 million remarried couples have at least one stepchild living with them in what has come to be called a **blended family**. Overall, 17 percent of all children in the United States live in blended families (U.S. Bureau of the Census, 2001; Bengtson et al., 2004).

blended family
a remarried couple that has at least one stepchild living with them

Living in a blended family is challenging for the children involved. There often is a fair amount of *role ambiguity*, in which roles and expectations are unclear. Children may be uncertain about their responsibilities, how to behave toward stepparents and stepsiblings, and how to make a host of decisions that have wide-ranging implications for their role in the family. For instance, a child in a blended family may have to choose which

parent to spend each vacation and holiday with, or to decide between the conflicting advice coming from biological parent and stepparent (Cath & Shopper, 2001; Belcher, 2003; Guadalupe & Welkley, 2012).

In many cases, however, elementary-school-age children in blended families often do surprisingly well. In comparison to adolescents, who have more difficulties, elementary-school-age children often adjust with relative ease to blended arrangements, for several reasons. For one thing, the family's financial situation often improves after a parent remarries. In addition, in a blended family there are more people to share the burden of household chores. Finally, the simple fact that the family contains more individuals increases the opportunities for social interaction (Greene, Anderson, & Hetherington, 2003; Hetherington & Elmore, 2003; Purswell & Dillman Taylor, 2013).

WATCH THIS VIDEO ON MYPSYCHLAB
BLENDED FAMILIES

Not all children of course adjust well to life in a blended family. Some find the disruption of routine and of established networks of family relationships difficult. For instance, a child who is used to having her mother's complete attention may find it difficult to observe her mother showing interest and affection to a stepchild. The most successful blending of families occurs when the parents create an environment that supports children's self-esteem and that permits all family members to feel a sense of togetherness. Generally, the younger the children, the easier the transition is within a blended family (Jeynes, 2007; Kirby, 2006.)

CHILDREN WITH GAY AND LESBIAN PARENTS. An increasing number of children have two mothers or two fathers. Estimates suggest that between 1 and 5 million families are headed by two lesbian or two gay parents in the United States, and some 6 million children have lesbian or gay parents (Patterson, 2007, 2009; Gates, 2013).

How do children in lesbian and gay households fare? A growing body of research on the effects of same-sex parenting on children shows that children develop similarly to the children of heterosexual families. Their sexual orientation is unrelated to that of their parents, their behavior is no more or less gender-typed, and they seem equally well adjusted (Fulcher, Sutfin, & Patterson, 2008; Patterson, 2002, 2003, 2009).

One large-scale analysis that examined 19 studies of children raised by gay and lesbian parents conducted over a 25-year period, encompassing well over a thousand gay, lesbian, and heterosexual families, confirmed these findings. The analysis found no significant differences between children raised by heterosexual parents and children raised by gay or lesbian parents on measures of children's gender role, gender identity, cognitive development, sexual orientation, and social and emotional development. The one significant difference that did emerge was the quality of the relationship between parent and child; interestingly, the gay and lesbian parents reported having *better* relationships with their children than did heterosexual parents (Crowl, Ahn, & Baker, 2008).

Other research shows that children of lesbian and gay parents have similar relationships with their peers as children of heterosexual parents. They also relate to adults—both those who are gay and those who are straight—no differently from children whose parents are heterosexual. And when they reach adolescence, their romantic relationships and sexual behavior are no different from those of adolescents living with opposite-sex parents (Patterson, 1995, 2009; Golombok et al., 2003; Wainright, Russell, & Patterson, 2004).

In short, research shows that there is little developmental difference between children whose parents are gay and lesbian and those who have heterosexual parents. What is clearly different for children with same-sex parents is the possibility of discrimination and prejudice due to their parents' sexual orientation, although U.S. society has become considerably more tolerant of such unions. In fact, the recent Supreme Court ruling legalizing same-sex marriages should accelerate the trend of acceptance of such unions (Davis, Saltzburg, & Locke, 2009; Biblarz & Stacey, 2010; Kantor, 2015).

Children with gay or lesbian parents develop similarly to children with heterosexual parents.

RACE AND FAMILY LIFE. Although there are as many types of families as there are individuals, research does find some consistencies related to race (Parke, 2004). For example, African American families often have a particularly strong sense of family. Members of African American families are frequently willing to offer welcome and support to extended family members in their homes. Because there is a relatively high level of female-headed households among African Americans, the social and economic support of extended family often is critical. In addition, there is a relatively high proportion of families headed by older adults, such as grandparents, and some studies find that children in grandmother-headed households are particularly well adjusted (McLoyd et al., 2000; Smith & Drew, 2002; Taylor, 2002).

Hispanic families also often stress the importance of family life, as well as community and religious organizations. Children are taught to value their ties to their families, and they come to see themselves as a central part of an extended family. Ultimately, their sense of who they are becomes tied to the family. Hispanic families also tend to be relatively larger, with an average size of 3.71, compared to 2.97 for Caucasian families and 3.31 for African American families (Cauce & Domenech-Rodriguez, 2002; U.S. Census Bureau, 2003; Halgunseth, Ispa, & Rudy, 2006).

Although relatively little research has been conducted on Asian American families, emerging findings suggest that fathers are more apt to be powerful figures, maintaining discipline. In keeping with the more collectivist orientation of Asian cultures, children tend to believe that family needs have a higher priority than personal needs, and males, in particular, are expected to care for their parents throughout their lifetimes (Ishii-Kuntz, 2000).

POVERTY AND FAMILY LIFE. Regardless of race, children living in families that are economically disadvantaged face significant hardships. Poor families have fewer basic everyday resources, and there are more disruptions in children's lives. For example, parents may be forced to look for less expensive housing or may move the entire household in order to find work. The result frequently is family environments in which parents are less responsive to their children's needs and provide less social support (Evans, 2004; Duncan, Magnuson & Votruba-Drzal, 2014).

The stress of difficult family environments, along with other stress in the lives of poor children—such as living in unsafe neighborhoods with high rates of violence and attending inferior schools—ultimately takes its toll. Economically disadvantaged children are at risk for poorer academic performance, higher rates of aggression, and conduct problems. In addition, declines in economic well-being are linked to physical and mental health problems. Specifically, the chronic stress associated with poverty makes children more susceptible to cardiovascular disease, depression, and Type 2 diabetes (Sapolsky, 2005; Morales & Guerra, 2006; Tracy et al., 2008).

GROUP CARE: ORPHANAGES IN THE TWENTY-FIRST CENTURY. The term *orphanage* evokes images of pitiful youngsters clothed in rags, eating porridge out of tin cups, and housed in huge, prison-like institutions. The reality today is different. Even the word *orphanage* is rarely used, having been replaced by *group home* or *residential treatment center*. Typically housing a relatively small number of children, group homes are used for children whose parents are no longer able to care for them adequately. They are usually funded by a combination of federal, state, and local aid.

Although the orphanages of the early 1900s were crowded and institutional (left), today the equivalent, called group homes or residential treatment centers (right), are much more pleasant.

Group care has grown significantly in the last decade. In the five-year period from 1995 to 2000, the number of children in foster care increased by more than 50 percent. Today, more than one-half million children in the United States live in foster care (Roche, 2000; Jones-Harden, 2004; Bruskas, 2008).

About three-quarters of children in group care are victims of neglect and abuse. Each year, 300,000 children are removed from their homes. Most of them can be returned to their homes following intervention with their families by social service agencies. But the remaining one-quarter are so psychologically damaged due to abuse or other causes that once they are placed in group care, they are likely to remain there throughout childhood. Children who have developed severe problems, such as high levels of aggression or anger, have difficulty finding adoptive families, and it is often difficult to find even temporary foster families who are able to cope with their emotional and behavior problems (Bass, Shields, & Behrman, 2004; Chamberlain et al., 2006).

Although some politicians have suggested that an increase in group care is a solution to complex social problems associated with unwed mothers who become dependent on welfare, experts in providing social services and psychological treatment are not so sure. For one thing, group homes cannot always consistently provide the support and love potentially available in a family setting. Moreover, group care is hardly cheap: It can cost some $40,000 per year to support a child in group care—about 10 times the cost of maintaining a child in foster care or on welfare (Roche, 2000; Allen & Bissell, 2004).

Other experts argue that group care is neither inherently good nor bad. Instead, the consequences of living away from one's family may be quite positive, depending on the particular characteristics of the staff of the group home and whether child and youth care workers are able to develop an effective, stable, and strong emotional bond with a specific child. On the other hand, if a child is unable to form a meaningful relationship with a worker in a group home, the results may well be harmful (Hawkins-Rodgers, 2007; Knorth et al., 2008).

School: The Academic Environment

LO 10.10 Describe how children's social and emotional lives affect their school performance in middle childhood.

Children spend more of their day in the classroom than anywhere else. It is not surprising, then, that schools have a profound impact on children's lives, shaping and molding

not only their ways of thinking but the ways they view the world. We turn now to a number of aspects of schooling in middle childhood that can have a profound effect on children.

HOW CHILDREN EXPLAIN ACADEMIC SUCCESS AND FAILURE. Most of us, at one time or another, have done poorly on a test. Think back to how you felt when you received a bad grade. Did you feel shame? Anger at the teacher? Fear of the consequences?

attributions
people's explanations for the reasons behind their behavior

How you react is a reflection of your **attributions**, the explanations for the reasons behind your behavior. People generally react to failure (as well as success) by considering whether the cause is due to *dispositional factors* ("I'm not such a smart person") or due to *situational* factors ("I didn't get enough sleep last night"). For example, when a success is attributed to internal factors ("I'm smart"), students tend to feel pride; but failure attributed to internal factors ("I'm so stupid") causes shame (Weiner, 2007; Hareli & Hess, 2008; Healy et al., 2015).

CULTURAL COMPARISONS: INDIVIDUAL DIFFERENCES IN ATTRIBUTION. Not everyone comes to the same conclusions about the sources of success and failure. In addition to individual differences, among the strongest influences on people's attributions are their race, ethnicity, and socioeconomic status. Attribution is a two-way street. While our attributions can affect our future performance, it is also true that different experiences give us different perceptions about the ways things in the world fit together. For this reason, it is not surprising that there are subcultural differences in how achievement-related behaviors are understood and explained.

One important difference is related to racial factors: African Americans are less likely than whites to attribute success to internal rather than external causes. African American children tend to feel that aspects such as how difficult a task is and luck (external causes) are the major determinants of their performance outcomes. They are likely to believe that even if they put in maximum effort, prejudice and discrimination (external causes) will prevent them from succeeding (Ogbu, 1988; Graham, 1990, 1994; Rodgers & Summers, 2008).

Such an attributional pattern, one that overemphasizes the importance of external causes, reduces a student's sense of personal responsibility for success or failure. When attributions are based on internal factors, they suggest that a change in behavior—such as increased effort—can bring about a change in success (Glasgow et al., 1997).

African Americans are not the only group susceptible to maladaptive attributional patterns. Women, for example, often attribute their unsuccessful performance to low ability, an uncontrollable factor. Ironically, though, they do not attribute successful performance to high ability, but rather to factors outside their control. A belief in this pattern suggests the conclusion that even with future effort, success will be unattainable. Females who hold these views may be less inclined to expend the effort necessary to improve their rate of success (Nelson & Cooper, 1997; Dweck, 2002). By contrast, the success rate of Asian students in school, as described in the following *Developmental Diversity and Your Life* section, illustrates the power of internal attributions.

BEYOND THE 3Rs: SHOULD SCHOOLS TEACH EMOTIONAL INTELLIGENCE? In many elementary schools, the hottest topic in the curriculum has little to do with the traditional 3Rs. Instead, a significant educational trend for educators in many elementary schools throughout the United States is the use of techniques to increase students' **emotional intelligence**, the skills that underlie the accurate assessment, evaluation, expression, and regulation of emotions (Salovey & Pizarro, 2003; Mayer, Salovey, & Caruso, 2000, 2008).

emotional intelligence
the set of skills that underlies the accurate assessment, evaluation, expression, and regulation of emotions

Psychologist Daniel Goleman (1995), who wrote a best-seller entitled *Emotional Intelligence*, argues that emotional literacy should be a standard part of the school curriculum. He points to several programs that are effective in teaching students to manage their emotions more effectively. For instance, in one program, children are provided with lessons in empathy, self-awareness, and social skills. In another, children are taught

Developmental Diversity and Your Life

Explaining Asian Academic Success

Consider two students, Ben and Hannah, each performing poorly in school. Suppose you thought that Ben's poor performance was due to unalterable, stable causes, such as a lack of intelligence, while Hannah's was produced by temporary causes, such as a lack of hard work. Who would you think would ultimately do better in school?

If you are like most people, you'd probably predict that the outlook was better for Hannah. After all, Hannah could always work harder, but it is hard for someone like Ben to develop higher intelligence.

According to psychologist Harold Stevenson, this reasoning lies at the heart of the superior school performance of Asian students compared with students in the United States. Stevenson's research suggests that teachers, parents, and students in the United States are likely to attribute school performance to stable, internal causes, while people in Japan, China, and other East Asian countries are more likely to see temporary, situational factors as the cause of their performance. The Asian view, which stems in part from ancient Confucian writings, tends to accentuate the necessity of hard work and perseverance (Stevenson, Lee, & Mu, 2000; Yang & Rettig, 2004; Phillipson, 2006).

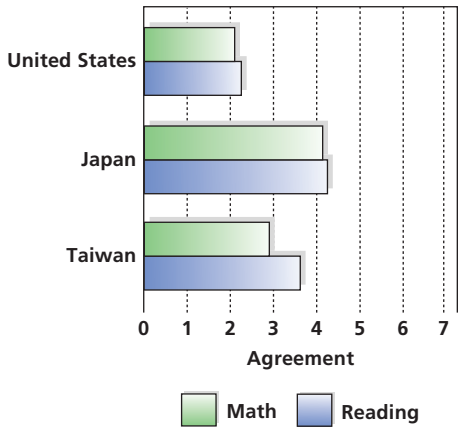
This cultural difference in attributional styles is displayed in several ways. For instance, surveys show that mothers, teachers, and students in Japan and Taiwan all believe strongly that students in a typical class tend to have the same amount of ability. In contrast, mothers, teachers, and students in the United States are apt to disagree, arguing that there are significant differences in ability among the various students (see Figure 10-5).

It is easy to imagine how such different attributional styles can influence teaching approaches. If, as in the United States, students and teachers seem to believe that ability is fixed and locked in, poor academic performance will be greeted with a sense of failure and reduced motivation to work harder to overcome it. In contrast, Japanese teachers and students are apt to see failure as a temporary setback due to their lack of hard work. After making such an attribution, they are more apt to expend increased effort on future academic activities.

Figure 10-5 Mothers' Beliefs in Children's Ability

Compared to mothers in Taiwan and Japan, U.S. mothers were less apt to believe that all children have the same degree of underlying, innate ability. Subjects responded using a 7-point scale, where 1 = strongly disagree and 7 = strongly agree. What are the implications of this finding for schooling in the United States?

(**Source:** Stevenson & Lee, 1990.)



These different attributional orientations may explain the fact that Asian students frequently outperform American students in international comparisons of student achievement, according to some developmentalists (Linn, 1997; Wheeler, 1998). Because Asian students tend to assume that academic success results from hard work, they may put greater effort into their schoolwork than American students, who believe that their inherent ability determines their performance. These arguments suggest that the attributional style of students and teachers in the United States might well be maladaptive. They also argue that the attributional styles taught to children by their parents may have a significant effect on their future success (Eaton & Dembo, 1997; Little & Lopez, 1997; Little, Miyashita, & Karasawa, 2003).

about caring and friendship as early as first grade through exposure to stories in which characters exhibit these positive qualities.

Programs meant to increase emotional intelligence have not met with universal acceptance. Critics suggest that the nurturance of emotional intelligence is best left to students' families and that schools ought to concentrate on more traditional curriculum matters. Others suggest that adding emotional intelligence to an already crowded curriculum may reduce time spent on academics. Finally, some critics argue that there is no well-specified set of criteria for what constitutes emotional intelligence, and consequently it is difficult to develop appropriate, effective curriculum materials (Humphrey et al., 2007).

Still, most people consider emotional intelligence to be worthy of nurturance. Certainly, it is clear that emotional intelligence is quite different from traditional conceptions of intelligence. For example, most of us can think of individuals who, while quite intelligent in a traditional sense, are also insensitive and socially unskilled. The goal of emotional intelligence training is to produce people who are not only cognitively sophisticated but are also able to manage their emotions effectively (Sleek, 1997; Nelis et al., 2009).

Module 10.3 Review

- Self-care children may develop independence and enhanced self-esteem from their experience. How divorce affects children depends on such factors as financial circumstances and the comparative levels of tension in the family before and after the divorce. The effects of being raised in a single-parent household depend on financial circumstances, the amount of parent–child interaction, and the level of tension in the family.
- Attributional patterns differ along individual, cultural, and gender dimensions. Emotional intelligence—the skills that underlie the accurate assessment, evaluation, expression, and regulation of emotions—is becoming accepted as an important aspect of social intelligence.

Journal Writing Prompt

Applying Lifespan Development: Politicians often speak of "family values." How does this term relate to the diverse family situations covered in this chapter, including divorced parents, single parents, blended families, working parents, self-care children, abusive families, and group care?

Epilogue

Self-esteem and moral development are two key areas in social and personality development in the middle childhood years. Children at this age tend to develop and rely on deeper relationships and friendships, and we looked at the ways gender and race can affect friendships. The changing nature of family arrangements can also affect social and personality development. So can the ways children and teachers explain school successes and failures. Finally, we concluded with a discussion of emotional intelligence, a set of qualities that enhances children's ability to feel empathy for others and to control and express their emotions.

Return to the prologue—about the different views of Dave Rudowski—and answer the following questions.

1. How would you describe Dave's social status among his peers? What clues does the story provide?
2. Do you think Dave's statement that he likes to go his own way implies that he makes little use of social comparison? Cite examples from the story to support your answer.
3. Taking into account all the different views of Dave, including his own, how would you say Dave is managing what Erickson calls the industry-versus-inferiority stage?
4. How is Dave's self-concept an example of the changes that typically occur from the preschool age to the middle-grade years? What would you estimate Dave's self-esteem to be?

Looking Back

LO 10.1 Describe the major developmental challenge of middle childhood.

According to Erikson, children in the middle childhood years are in the industry-versus-inferiority stage, focusing on achieving competence and responding to a wide range of personal challenges.

LO 10.2 Summarize ways in which children's views of themselves change during middle childhood.

Children in the middle childhood years begin to view themselves in terms of psychological characteristics and to differentiate their self-concepts into separate areas. They use social comparison to evaluate their behavior, abilities, expertise, and opinions.

LO 10.3 Explain why self-esteem is important during middle childhood.

Children in these years are developing self-esteem; those with chronically low self-esteem can become trapped in a cycle of failure in which low self-esteem feeds on itself by producing low expectations and poor performance.

LO 10.4 Describe how children's sense of right and wrong changes in middle childhood.

According to Kohlberg, people pass from preconventional morality (motivated by rewards and punishments), through conventional morality (motivated by social reference), to postconventional morality (motivated by a sense of universal moral principles). Gilligan has sketched out an alternative progression for girls, from an orientation toward individual survival, through goodness as self-sacrifice, to the morality of nonviolence.

LO 10.5 Describe the sorts of relationships and friendships that are typical of middle childhood.

Children's friendships display status hierarchies, and their understanding of friendship passes through stages, from a focus on mutual liking and time spent together, through the consideration of personal traits and the rewards that friendship provides, to an appreciation of intimacy and loyalty.

LO 10.6 Describe what makes a child popular and why it is important in middle childhood.

Popularity in children is related to traits that underlie social competence. Because of the importance of social interactions and friendships, developmental researchers have engaged in efforts to improve social problem-solving skills and the processing of social information.

LO 10.7 Describe how gender affects friendships in middle childhood.

Boys and girls in middle childhood increasingly prefer same-gender friendships. Male friendships are characterized by groups, status hierarchies, and restrictive play. Female friendships tend to involve one or two close relationships, equal status, and a reliance on cooperation.

LO 10.8 Describe how friendships between the races change during the school years.

Cross-race friendships diminish in frequency as children age. Equal-status interactions among members of different racial groups can lead to improved understanding, mutual respect and acceptance, and a decreased tendency to stereotype.

LO 10.9 Summarize how today's diverse family and care arrangements affect children in middle childhood.

Children in families in which both parents work outside the home generally fare well. Self-care children who fend for themselves after school may develop independence and a sense of competence and contribution. Immediately after a divorce, the effects on children in the middle childhood years can be serious, depending on the financial condition of the family and the hostility level between spouses before the divorce. The consequences of living in a single-parent family depend on the financial condition of the family and, if there had been two parents, the level of hostility that existed between them. Blended families present challenges to the child but can also offer opportunities for increased social interaction. Children in group care tend to have been victims of neglect and abuse. Many can be helped and placed with their own or other families, but about 25 percent of them will spend their childhood years in group care.

LO 10.10 Describe how children's social and emotional lives affect their school performance in middle childhood.

People attach attributions to their academic successes and failures. Differences in attributional patterns are not only individual but also appear to be influenced by culture and gender as well. Emotional intelligence is the set of skills that permits people to manage their emotions effectively.

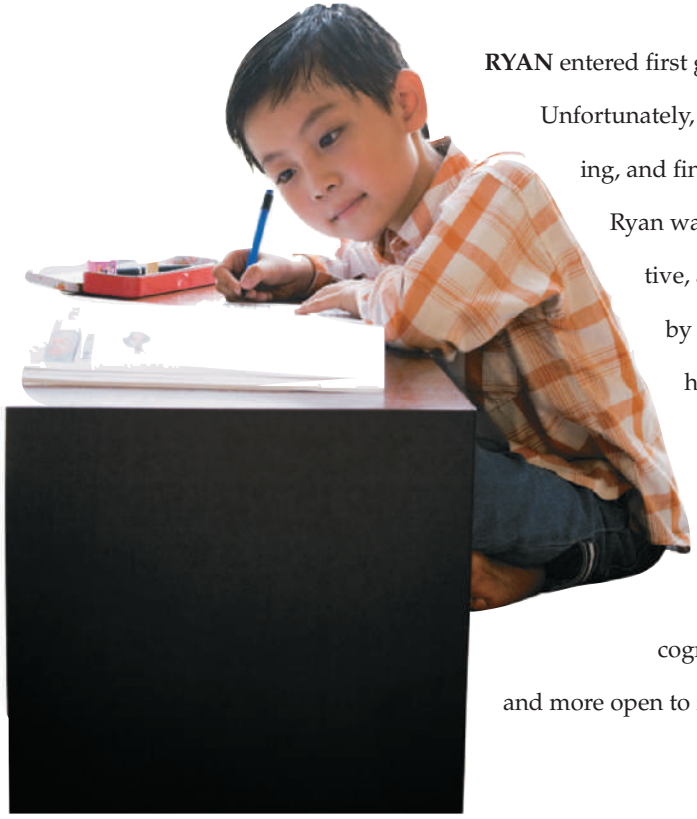
Key Terms and Concepts

industry-versus-inferiority stage 344
social comparison 345
self-esteem 347
status 356
social competence 357
social problem solving 357
dominance hierarchy 360
coregulation 363
self-care children 364
blended family 366
attributions 370
emotional intelligence 370

SUMMARY

4 Putting It All Together

Middle Childhood



RYAN entered first grade with boundless hope and a keen desire to read. Unfortunately, an undiagnosed vision problem interfered with his reading, and fine motor deficits made writing difficult. In most other ways, Ryan was at least the equal of his peers: physically active, imaginative, and highly intelligent. Socially, however, he was hampered by spending time in special education classes. Because he had been singled out and because he could not do some of the things his classmates could do, he was ignored, even bullied, by some of them. When he finally got the right treatment, though, most of his problems vanished. His physical and social skills advanced to match his cognitive abilities. He became more engaged in his schoolwork and more open to friendships. Ryan's story had a happy ending.

WHAT WOULD YOU DO?

■ How would you deal with a situation in which your child had physical disabilities that would prevent him or her from progressing in school? How would you encourage your child? How would you deal with your child's frustration at falling behind in school?

What's your response?

WHAT WOULD A PARENT DO?

■ What strategies would you use to help Ryan overcome his difficulties and function effectively? How would you bolster his self-esteem?

What's your response?

Physical Development

- Steady growth and increased abilities characterized Ryan's physical development in these years.
- Ryan's gross and fine motor skills developed as muscle coordination improved and he practiced new skills.
- Ryan's sensory problems interfered with his schoolwork.

Cognitive Development

- Ryan's intellectual abilities, such as language and memory increased in middle childhood.
- One of the key academic tasks for Ryan was to read fluently and with appropriate comprehension.
- Ryan displayed many components and types of intelligence, and the development of his intellectual skills was aided by his social interactions.

Social and Personality Development

- In this period, Ryan mastered many of the challenges presented by school and peers, which took on central importance in his life.
- The development of Ryan's self-esteem was particularly crucial; when Ryan felt himself inadequate, his self-esteem suffered.
- Ryan's friendships helped provide emotional support and fostered intellectual growth.

WHAT WOULD A HEALTH-CARE PROVIDER DO?

- How might you respond to Ryan's vision and motor problems? What if Ryan's parents had refused to believe that there was anything physically wrong with Ryan? How would you convince them to get treatment for Ryan?

What's your response?

WHAT WOULD AN EDUCATOR DO?

- How would you deal with Ryan's difficulties in reading and writing? What would you do to help integrate him into his class and help him make friends with his classmates? What would you recommend in terms of educational specialists to deal with his problems?

What's your response?

Chapter 11

Physical and Cognitive Development in Adolescence

Learning Objectives

LO 11.1 Describe the physical changes adolescents experience as the body reaches puberty.

LO 11.2 Explain the nutritional needs and concerns of adolescents.

LO 11.3 Summarize the ways in which the brain develops in adolescence.

LO 11.4 Describe how cognitive development proceeds during adolescence according to Piaget.

LO 11.5 Summarize how information processing approaches explain adolescent cognitive development.

LO 11.6 Describe how adolescent egocentrism affects thinking and behavior.

LO 11.7 Analyze the factors that affect adolescent school performance.

LO 11.8 Describe how adolescents use the Internet.

LO 11.9 Analyze what illegal drugs adolescents use and why.

LO 11.10 Discuss how adolescents use and abuse alcohol.

LO 11.11 Summarize how and why adolescents use tobacco.

LO 11.12 Describe dangers adolescent sexual practices present and how these dangers can be avoided.

Chapter Overview

Prologue: Not a Child Anymore

Gavin Wyman is locked in an argument with his dad. Though it's not their first battle, it's the biggest one to date. Fifteen-year-old Gavin is set on traveling to Haiti next month at the end of the school year to help with disaster relief after a recent hurricane. His dad is equally set against the idea. "Grandpa was a Freedom Rider," Gavin argues. "And you went to Guatemala with Habitat for Humanity." "Grandpa was 18 when he went south to fight for civil rights," Gavin's father reminds him, "and I was *20* when I went to Guatemala." "But I'm almost 16," Gavin cries, his voice cracking. "Besides, kids grow up a lot faster today." Gavin's dad looks at his son, who now towers several inches above him, and sees a boy just one year out of middle school asking to travel far from home on his own. Gavin looks at his dad and sees a jailer bent on limiting Gavin's life and treating him like a child. The argument is once again in stalemate, but Gavin is determined. He falls asleep that night, imagining himself doing heroic deeds in Haiti: helping people to build a new and better life, maybe even saving lives. In Haiti, he thinks, people will appreciate him, look up to him. ■

During adolescence, teenagers' lives become increasingly complex.

Looking Ahead

Like Gavin, many adolescents crave independence and feel that their parents fail to see how much they've matured. They are keenly aware of their changing bodies and their increasingly complex cognitive abilities. Daily, they deal with careening emotions, social networks that are in constant flux, and the temptations of sex, alcohol, and drugs. In this period of life that evokes excitement, anxiety, glee, and despair, they—like Gavin—are eager to prove they can handle whatever challenges come their way.

In this chapter and the next, we consider the basic issues and questions that underlie adolescence. This chapter focuses on physical and cognitive growth during adolescence. As we will see, it is a time of extraordinary physical maturation, triggered by the onset of puberty. We discuss the consequences of early and late maturation, as well as nutrition and eating disorders.

Next, we turn to a consideration of cognitive development during adolescence. After reviewing several approaches to understanding changes in cognitive capabilities, we examine school performance, focusing on the ways that socioeconomic status, ethnicity, and race affect scholastic achievement.

The chapter concludes with a discussion of several of the major threats to adolescents' well-being. We will focus on drug, alcohol, and tobacco use as well as sexually transmitted infections.

Physical Maturation

For the male members of the Awa tribe, the beginning of adolescence is signaled by an elaborate and—to Western eyes—gruesome ceremony marking the transition from childhood to adulthood. The boys are whipped for two or three days with sticks and prickly branches. Through the whipping, the boys atone for their previous infractions and honor tribesmen who were killed in warfare. But that's just for starters; the ritual continues for days more.

Most of us probably feel gratitude that we did not have to endure such physical trials when we entered adolescence. But members of Western cultures do have their own rites of passage into adolescence, admittedly less fearsome, such as bar mitzvahs and bat mitzvahs at age 13 for Jewish boys and girls, and confirmation ceremonies in many Christian denominations (Dunham, Kidwell, & Wilson, 1986; Delaney, 1995; Herdt, 1998; Eccles, Templeton, & Barber, 2003; Hoffman, 2003).

From *an educator's* perspective

Why do you think the passage to adolescence is regarded in many cultures as such a significant transition that it calls for unique ceremonies?

Regardless of the nature of the ceremonies celebrated by various cultures, their underlying purpose tends to be similar from one culture to the next: symbolically celebrating the onset of the physical changes that turn a child's body into an adult body capable of reproduction. With these changes the child exits childhood and arrives at the doorstep of adulthood.

Growth during Adolescence: The Rapid Pace of Physical and Sexual Maturation

LO 11.1 Describe the physical changes adolescents experience as the body reaches puberty.

adolescence
the developmental stage that lies between childhood and adulthood

Adolescence is the developmental stage that lies between childhood and adulthood. It is generally viewed as starting just before the teenage years and ending just after them. It is a transitional stage. Adolescents are considered no longer children, but not yet adults. It is a time of considerable physical and psychological growth and change. In fact, in only a few months, adolescents can grow several inches and require a virtually new wardrobe as they are transformed, at least in physical appearance, from children to young adults. One aspect of this transformation is the adolescent growth spurt, a period of very rapid growth in height and weight. On average, boys grow 4.1 inches a year and girls 3.5 inches a year. Some adolescents grow as much as 5 inches in a single year (Tanner, 1972; Caino et al., 2004).

Boys' and girls' adolescent growth spurts begin at different times. As you can see in Figure 11-1, girls begin their spurts around age 10, while boys start at about age 12. During the two-year period starting at age 11, girls tend to be taller than boys. But by the age of 13, boys, on average, are taller than girls—a state of affairs that persists for the remainder of the life span.

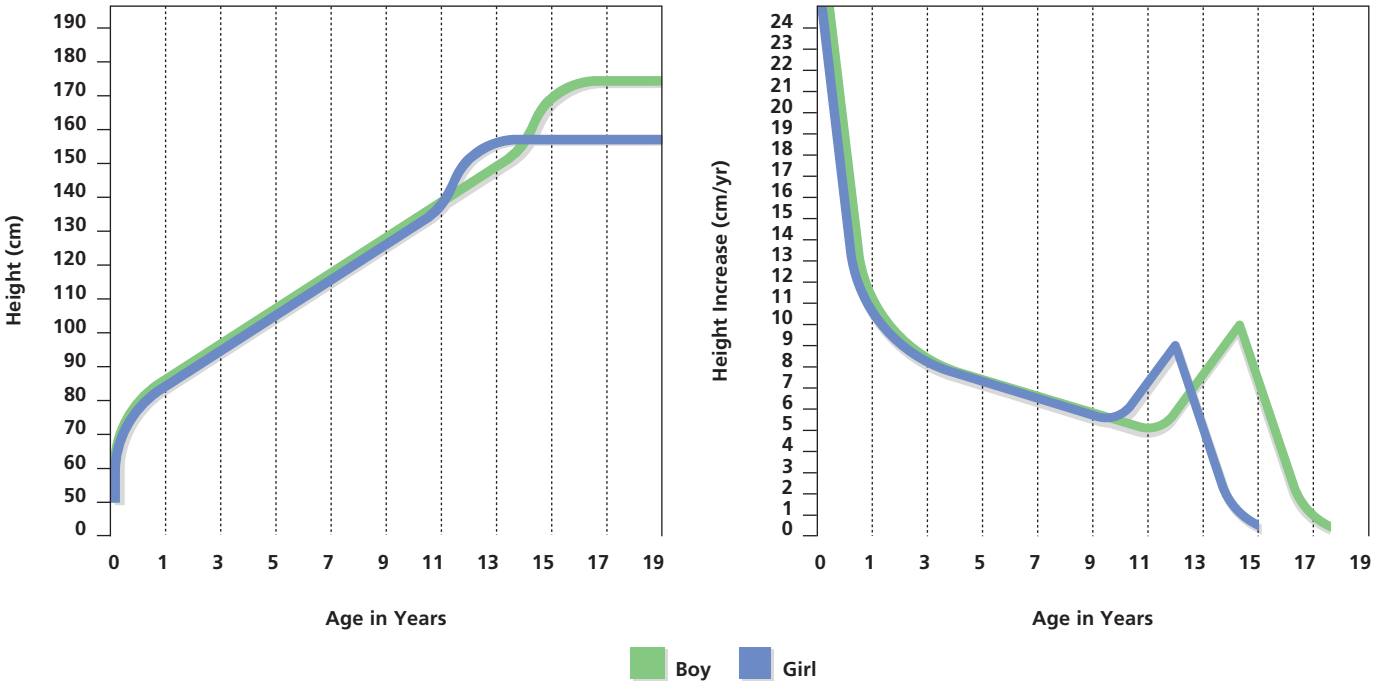
puberty
the period during which the sexual organs mature

Puberty, the period during which the sexual organs mature, begins when the pituitary gland in the brain signals other glands in children's bodies to begin producing the sex hormones, *androgens* (male hormones) or *estrogens* (female hormones), at adult levels. (Males and females produce both types of sex hormones, but males have a higher

Figure 11-1 Growth Patterns

Patterns of growth are depicted in two ways. The first figure shows height at a given age, while the second shows the height *increase* that occurs from birth through the end of adolescence. Notice that girls begin their growth spurt around age 10, while boys begin the growth spurt at about age 12. However, by the age of 13, boys tend to be taller than girls. What are the social consequences for boys and girls of being taller or shorter than average?

(**Source:** Adapted from Cratty, 1986.)



concentration of androgens and females a higher concentration of estrogens.) The pituitary gland also signals the body to increase production of growth hormones that interact with the sex hormones to cause the growth spurt and puberty. In addition, the hormone *leptin* appears to play a role in the start of puberty.

menarche
the onset of menstruation

Like the growth spurt, puberty begins earlier for girls than for boys. Girls start puberty at around age 11 or 12, and boys begin at around age 13 or 14. However, there are wide variations among individuals. For example, some girls begin puberty as early as 7 or 8 or as late as 16 years of age.

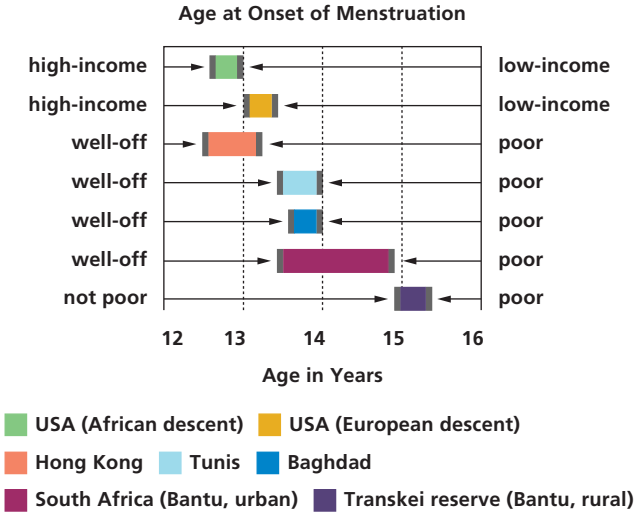
PUBERTY IN GIRLS. It is not clear why puberty begins at a particular time. What is clear is that environmental and cultural factors play a role. For example, **menarche**, the onset of menstruation and probably the most obvious signal of puberty in girls, varies greatly in different parts of the world. In poorer, developing countries, menstruation begins later than in more economically advantaged countries. Even within wealthier countries, girls in more affluent groups begin to menstruate earlier than less affluent girls (see Figure 11-2).

Consequently, it appears that girls who are better nourished and healthier are more apt to start menstruation at an earlier age than those who suffer from malnutrition or chronic disease. In fact, some studies have suggested that weight or the proportion of fat to muscle in the body might play a critical role in the timing of menarche. For example, in the United States, athletes with a low percentage of body fat may start menstruating later than less active girls. Conversely, obesity—which results in an increase in

Figure 11-2 Onset of Menstruation

The onset of menstruation occurs earlier in more economically advantaged countries than in those that are poorer. But even in wealthier countries, girls living in more affluent circumstances begin to menstruate earlier than those living in less affluent situations. Why is this the case?

(**Source:** Adapted from Eveleth & Tanner, 1976.)



the secretion of leptin, a hormone associated with the onset of menstruation—leads to earlier puberty (Woelfle, Harz, & Roth, 2007; Sanchez-Garrido & Tena-Sempere, 2013).

Other factors can affect the timing of menarche. For instance, environmental stress due to such factors as parental divorce or high levels of family conflict can bring about an early onset (Kaltiala-Heino, Kosunen, & Rimpela, 2003; Ellis, 2004; Belsky et al., 2007).

Over the past 100 years or so, girls in the United States and other cultures have been experiencing puberty at earlier ages. Near the end of the nineteenth century, menstruation began, on average, around age 14 or 15, compared with today's 11 or 12. Other indicators of puberty, such as the age at which adult height and sexual maturity are reached, have also appeared at earlier ages, probably due to reduced disease and improved nutrition (McDowell, Brody, & Hughes, 2007; Harris, Prior, & Koehoorn, 2008; James et al., 2012).

secular trend
a pattern of change occurring over several generations

The earlier start of puberty is an example of a significant **secular trend**, a pattern of change occurring over several generations. Secular trends occur when a physical characteristic changes over the course of several generations, such as earlier onset of menstruation or increased height that has occurred as a result of better nutrition over the centuries.

primary sex characteristics
characteristics associated with the development of the organs and structures of the body that directly relate to reproduction

secondary sex characteristics
the visible signs of sexual maturity that do not directly involve the sex organs

Menstruation is just one of several changes in puberty that are related to the development of primary and secondary sex characteristics. **Primary sex characteristics** are associated with the development of the organs and structures of the body that directly relate to reproduction. In contrast, **secondary sex characteristics** are the visible signs of sexual maturity that do not involve the sex organs directly.

In girls, the development of primary sex characteristics involves changes in the vagina and uterus. Secondary sex characteristics include the development of breasts and pubic hair. Breasts begin to grow at around the age of 10, and pubic hair begins to appear at about age 11. Underarm hair appears about two years later.

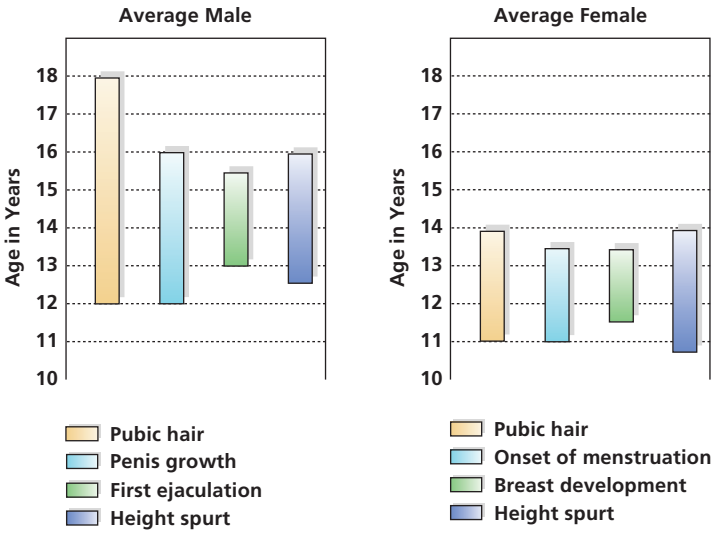
For some girls, indications of puberty start unusually early. One out of seven Caucasian girls develops breasts or pubic hair by age eight. Even more surprisingly, the figure is one out of two for African American girls. The reasons for this earlier onset of puberty are unclear, and the demarcation between normal and abnormal onset of puberty is a point of controversy among specialists (Ritzen, 2003; Mensah et al., 2013; Mrug et al., 2014).

PUBERTY IN BOYS. Boys' sexual maturation follows a somewhat different course. The penis and scrotum begin to grow at an accelerated rate around the age of 12, and they reach adult size about three or four years later. As boys' penises enlarge, other primary sex characteristics are developing with enlargement of the prostate gland and seminal vesicles, which produce semen (the fluid that carries sperm). A boy's first ejaculation, known as *spermarche*, usually occurs around the age of 13, more than a year after the body has begun producing sperm. At first, the semen contains relatively few sperm, but the amount of sperm increases significantly with age. Secondary sex characteristics are also developing. Pubic hair begins to grow around the age of 12, followed by the growth of underarm and facial hair. Finally, boys' voices deepen as the vocal cords become longer and the larynx larger. (Figure 11-3 summarizes the changes that occur in sexual maturation during early adolescence.)

The surge in production of hormones that triggers the start of adolescence may also lead to rapid swings in mood. For example, boys may have feelings of anger and annoyance that are associated with higher hormone levels. In girls, the emotions produced by hormone production are somewhat different: Higher levels of hormones are associated with anger and depression (Buchanan, Eccles, & Becker, 1992; Fujisawa & Shinohara, 2011).

Figure 11-3 Sexual Maturation

The changes in sexual maturation that occur for males and females during early adolescence.
(**Source:** Based on Tanner, 1978.)



Note the changes that have occurred in just a few years in these pre- and post-puberty photos of the same boy.

BODY IMAGE: REACTIONS TO PHYSICAL CHANGES IN ADOLESCENCE. Unlike infants, who also undergo extraordinarily rapid growth, adolescents are well aware of what is happening to their bodies, and they may react with horror or joy, spending long periods in front of mirrors. Few, though, are neutral about the changes they are witnessing.

Some of the changes of adolescence do not show up in physical changes but carry psychological weight. In the past, girls tended to react to menarche with anxiety because Western society tended to emphasize the more negative aspects of menstruation, such as the potential of cramps and messiness. Today, however, society's view of menstruation is more positive, in part because menstruation has been demystified and discussed more openly. (For instance, television commercials for tampons are commonplace.) As a consequence, menarche is typically accompanied by an increase in self-esteem, a rise in status, and greater self-awareness, as adolescent girls see themselves as becoming adults (Matlin, 2003; Yuan, 2012; Chakraborty & De, 2014).

A boy's first ejaculation is roughly equivalent to menarche in a girl. However, while girls generally tell their mothers about the onset of menstruation, boys rarely mention their first ejaculation to their parents or even their friends (Stein & Reiser, 1994). Why? One reason is that girls require tampons or sanitary napkins, and mothers provide them. It also may be that boys see the first ejaculation as an indication of their budding sexuality, an area about which they are quite uncertain and therefore reluctant to discuss with others.

Menstruation and ejaculations occur privately, but changes in body shape and size are quite public. Consequently, teenagers entering puberty frequently are embarrassed by the changes that are occurring. Girls, in particular, are often unhappy with their new bodies. Ideals of beauty in many Western countries call for an unrealistic thinness that is quite different from the actual shape of most women. Puberty brings a considerable increase in the amount of fatty tissue, as well as enlargement of the hips and buttocks—a far cry from the slenderness that society seems to demand (Unger & Crawford, 2004; McCabe & Ricciardelli, 2006; Cotrufo et al., 2007).

How children react to the onset of puberty depends in part on when it happens. Girls and boys who mature either much earlier or later than most of their peers are especially affected by the timing of puberty.

WATCH THIS VIDEO ON MYPSYCHLAB BODY IMAGE PART 1: KIANNA, 12 YEARS OLD

Boys who mature early tend to be more successful in athletics and have a more positive self-concept. But what might be the downside to early maturation?

THE TIMING OF PUBERTY: THE CONSEQUENCES OF EARLY AND LATE MATURATION. Why does it matter when a boy or girl reaches puberty? It matters because early or late maturation has social consequences. And as we shall see, social consequences are very important to adolescents.

Early Maturation. For boys, early maturation is largely a plus. Early-maturing boys tend to be more successful at athletics, presumably because of their larger size. They also tend to be more popular and to have a more positive self-concept.

Early maturation in boys does have a downside, however. Boys who mature early are more apt to have difficulties in school, and they are more likely to become involved in delinquency and substance abuse. The reason: Their larger size makes it more likely that they will seek out the company of older boys who may involve them in activities that are inappropriate for their age. Overall, though, the pluses seem to outweigh the minuses for early-maturing boys (Costello et al., 2007; Lynne et al., 2007; Beltz et al., 2014).

The story is a bit different for early-maturing girls. For them, the obvious changes in their bodies—such as the development of breasts—may lead them to feel uncomfortable and different from their peers. Moreover, because girls, in general, mature earlier than boys, early maturation tends to come at a very young age in the girl's life. Early-maturing girls may have to endure ridicule from their less mature classmates (Franko & Striegel-Moore, 2002; Olivardia & Pope, 2002; Mendle, Turkheimer, & Emery, 2007).

Early maturation is not a completely negative experience for girls. Girls who mature earlier tend to be sought after more as potential dates, and their popularity may enhance their self-concept. This attention has a price, however. They may not be socially ready to participate in the kind of one-on-one dating situations that most girls deal with at a later age, and such situations may be psychologically challenging for early-maturing girls. Moreover, the conspicuousness of their deviance from their later-maturing classmates may have a negative effect, producing anxiety, unhappiness, and depression (Kaltiala-Heino et al., 2003; Galvao et al., 2013).

Cultural norms and standards regarding how women should look play a big role in how girls experience early maturation. For instance, in the United States, the notion of female sexuality is looked upon with a degree of ambivalence, being promoted in the media yet frowned upon socially. Girls who appear "sexy" attract both positive and negative attention.

Consequently, unless a young girl who has developed secondary sex characteristics early can handle the disapproval she may encounter when she conspicuously displays her growing sexuality, the outcome of early maturation may be negative. In countries in which attitudes about sexuality are more liberal, the results of early maturation may be more positive. For example, in Germany, which has a more open view of sex, early-maturing girls have higher self-esteem than such girls in the United States. Furthermore, the consequences of early maturation vary even within the United States, depending on the views of girls' peer groups and on prevailing community standards regarding sex (Petersen, 2000; Güre, Uçanok, & Sayil, 2006).

Late Maturation. As with early maturation, the situation with late maturation is mixed, although in this case boys fare worse than girls. For instance, boys who are smaller and lighter than their more physically mature peers tend to be viewed as less attractive. Because of their smaller size, they are at a disadvantage when it comes to sports activities. Furthermore, boys are expected to be bigger than their dates, so the social lives of late-maturing boys may suffer. Ultimately, if the difficulties in adolescence lead to a decline in self-concept, the disadvantages of late maturation for boys could extend well into adulthood. On the other hand, coping with the challenges of late maturation may actually help males in some ways. For example, late-maturing boys grow up to have several positive qualities, such as assertiveness and insightfulness (Kaltiala-Heino et al., 2003).

The picture for late-maturing girls is generally more positive. In the short term, girls who mature later may be overlooked in dating and other mixed-sex activities during junior high school and middle school, and they may have relatively low social status. However, by the time they are in the tenth grade and have begun to mature visibly, late-maturing-girls' satisfaction with themselves and their bodies may be greater than that of early maturers. In fact, late-maturing girls may end up with fewer emotional problems. The reason? Late-maturing girls are more apt to fit the societal ideal of a slender, "leggy" body type than early maturers, who tend to look heavier in comparison (Petersen, 1988; Kaminaga, 2007; Leen-Feldner, Reardon, & Hayward, 2008).

In sum, the reactions to early and late maturation present a complex picture. As we have seen repeatedly, we need to take into consideration the complete constellation of factors affecting individuals in order to understand their development. Some developmentalists suggest that other factors, such as changes in peer groups, family dynamics, and particularly schools and other societal institutions, may be more pertinent in determining an adolescent's behavior than early and later maturation, and the effects of puberty in general (Stice, 2003; Mendle, Turkheimer, & Emery, 2007; Hubley & Arim, 2012).

Nutrition, Food, and Eating Disorders: Fueling the Growth of Adolescence

LO 11.2 Explain the nutritional needs and concerns of adolescents.

At 16, Ariel Porter was pretty, outgoing, and popular, but when a boy she liked kidded her about being "too fat" to take out, she took it seriously. She began to obsess about food, using her mom's food scale to plan her meals compulsively. She kept charts of portion sizes, weights, and calories, cutting her food into tiny morsels and placing minuscule amounts of meat, vegetables, and fruit into an array of zip-up bags labeled with the days of the week and acceptable times of consumption.

In a few months, Ariel went from 101 pounds to 83. Her hips and ribs became clearly visible, and her fingers and knees ached constantly. Her menstrual periods stopped flat, her hair developed split ends, and her fingernails broke easily. Still, Ariel insisted she was overweight, pinching imaginary pockets of fat on her body to prove her point. What finally got her to accept that she had a problem was the return of her older sister from college. At first sight of Ariel, her sister gasped audibly, dropped to her knees, and broke down crying.

Ariel's problem: a severe eating disorder, anorexia nervosa. As we have seen, the cultural ideal of slim and fit favors late-developing girls. But when those developments do occur, how do girls and, increasingly, boys cope when the image in the mirror deviates from the ideal presented in the popular media?

The rapid physical growth of adolescence is fueled by an increase in food consumption. Particularly during the growth spurt, adolescents eat substantial quantities of food, increasing their intake of calories rather dramatically. During the teenage years, the average girl requires some 2,200 calories a day, and the average boy requires 2,800.

Of course, not just any calories help nourish adolescents' growth. Several key nutrients are essential, including, in particular, calcium and iron. The calcium provided by milk helps bone growth, which may prevent the later development of osteoporosis—the thinning of bones—that affects 25 percent of women later in their lives. Similarly, iron is necessary to prevent iron-deficiency anemia, an ailment that is not uncommon among teenagers.

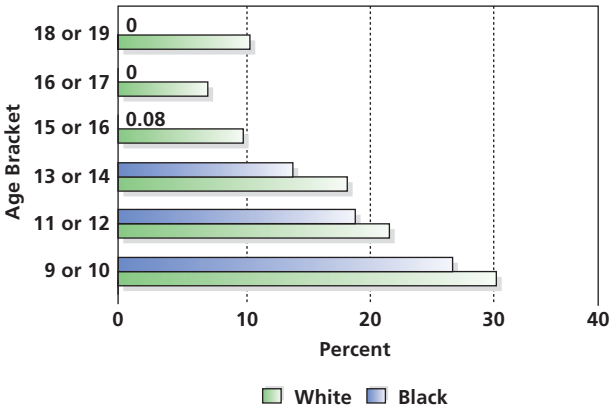
For most adolescents, the major nutritional issue is ensuring the consumption of a sufficient balance of appropriate foods. Two extremes of nutrition can be a major concern for a substantial minority and can create a real threat to health. Among the most prevalent problems: obesity and eating disorders like the one afflicting Ariel Porter.

OBESITY. The most common nutritional concern during adolescence is obesity. One in 5 adolescents is overweight, and 1 in 20 can be formally classified as obese (body weight that is more than 20 percent above average). Moreover, the proportion of female adolescents who are classified as obese increases over the course of adolescence (Critser, 2003; Kimm et al., 2003).

Figure 11-4 No Sweat

Physical activity among both white and black adolescent females declines substantially over the course of adolescence. What might be the reasons for this decline?

(**Source:** Based on Kimm et al., 2002.)



Although adolescents are obese for the same reasons as younger children, the psychological consequences may be particularly severe during a time of life when body image is of special concern. Furthermore, the potential health consequences of obesity during adolescence are also problematic. For instance, obesity taxes the circulatory system, increasing the likelihood of high blood pressure and type 2 diabetes. Finally, obese adolescents stand an 80 percent chance of becoming obese adults (Blaine, Rodman, & Newman, 2007; Goble, 2008; Wang et al., 2008; Morrison et al., 2015).

Lack of exercise is one of the main culprits. One survey found that by the end of the teenage years, most females get virtually no exercise outside of physical education classes in school. The older they are, the less exercise female adolescents engage in. The problem is particularly pronounced for older black female adolescents, more than half of whom report *no* physical exercise outside of school, compared with about a third of white adolescents who report no exercise (see Figure 11-4; Delva, O'Malley, & Johnston, 2006; Reichert et al., 2009; Nicholson & Browning, 2012).

Why do adolescent girls get so little exercise? It may reflect a lack of organized sports or good athletic facilities for girls. It may even be the result of lingering cultural norms suggesting that athletic participation is more the realm of boys than girls.

There are additional reasons for the high rate of obesity during adolescence. One is the availability of fast foods, which deliver large portions of high-calorie, high-fat cuisine at prices adolescents can afford. In addition, many adolescents spend a significant proportion of their leisure time inside their homes using social media, watching television, and playing video games. Such sedentary activities not only keep adolescents from exercising, but they often are also accompanied by snacks of junk foods (Bray, 2008; Thivel et al., 2011; Laska et al., 2012).

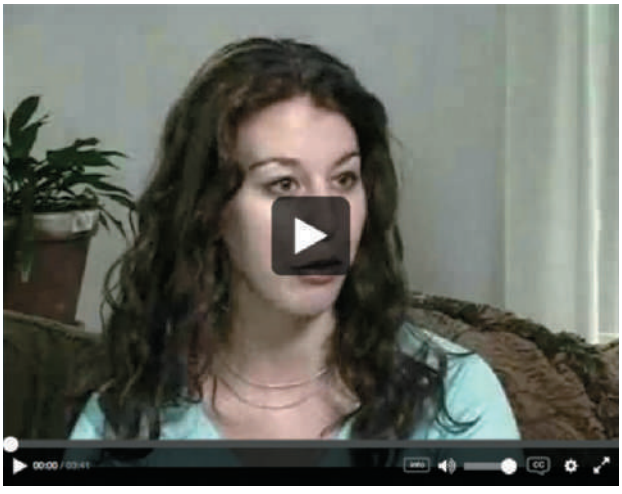
anorexia nervosa
a severe eating disorder in which individuals refuse to eat, while denying that their behavior and appearance, which may become skeletal, are out of the ordinary

bulimia
an eating disorder characterized by binges on large quantities of food, followed by purges of the food through vomiting or the use of laxatives

ANOREXIA NERVOSA AND BULIMIA. The fear of fat and the desire to avoid obesity sometimes become so strong that they turn into a problem. For instance, Ariel Porter suffered from **anorexia nervosa**, a severe eating disorder in which individuals refuse to eat. Their troubled body image leads them to deny that their behavior and appearance, which may become skeletal, are out of the ordinary.

Anorexia is a dangerous psychological disorder; some 15 to 20 percent of its victims literally starve themselves to death. It primarily afflicts women between the ages of 12 and 40; those most susceptible are intelligent, successful, and attractive white adolescent girls from affluent homes. Anorexia is also becoming a problem for more boys. About 10 percent of victims are male, a percentage that is increasing and is associated with the use of steroids (Crisp et al., 2006; Schecklmann et al., 2012; Herpertz-Dahlmann, 2015).

WATCH THIS VIDEO ON MYPSYCHLAB JESSICA: EATING DISORDERS



Even though they eat little, individuals with anorexia are often focused on food. They may go shopping often, collect cookbooks, talk about food, or cook huge meals for others. Although they may be incredibly thin, their body images are so distorted that they see their reflections in mirrors as disgustingly fat and try to lose more and more weight. Even when they look like skeletons, they are unable to see what they have become.

Bulimia, another eating disorder, is characterized by *binging*, eating large quantities of food, followed by *purging* of the food through vomiting or the use of laxatives. People with bulimia may eat an entire gallon of ice cream or a whole package of tortilla chips. But after such a binge, sufferers experience powerful feelings of guilt and depression, and they intentionally rid themselves of the food.

Although the weight of a person with bulimia remains fairly normal, the disorder is quite hazardous. The constant vomiting

and diarrhea of the binge-and-purge cycles may produce a chemical imbalance that can lead to heart failure.

The exact reasons for the occurrence of eating disorders are not clear, although several factors play a role. Dieting often precedes the development of eating disorders, as even normal-weight individuals are spurred on by societal standards of slenderness to seek to lower their weight. The feelings of control and success may encourage them to lose more and more weight. Furthermore, girls who mature earlier than their peers and who have a higher level of body fat are more susceptible to eating disorders during later adolescence as they try to bring their maturing bodies back into line with the cultural standard of a thin, boyish physique. Adolescents who are clinically depressed are also more likely to develop eating disorders later (Santos, Richards, & -Bleckley, 2007; Courtney, Gamboz, & Johnson, 2008; Wade & Watson, 2012).

Some experts suggest that a biological cause lies at the root of both anorexia nervosa and bulimia. Twin studies indicate that there are genetic components to the disorders. In addition, hormonal imbalances sometimes occur in sufferers (Kaye, 2008; Wade et al., 2008; Baker et al., 2009).

Other attempts to explain the eating disorders emphasize psychological and social factors. For instance, some experts suggest that the disorders are a result of perfectionistic, overdemanding parents or byproducts of other family difficulties. Culture also plays a role. Anorexia nervosa, for instance, is found only in cultures that idealize slender female bodies. Because in most places such a standard does not hold, anorexia is not prevalent outside the United States (Harrison & Hefner, 2006; Bennett, 2008; Bodell, Joiner, & Ialongo, 2012).

This young woman suffers from anorexia nervosa, a severe eating disorder in which people refuse to eat, while denying that their behavior and appearance are out of the ordinary.

For example, anorexia is quite rare in Asia, with two interesting exceptions: the upper classes of Japan and of Hong Kong, where Western influence is greatest. Furthermore, anorexia nervosa is a fairly recent disorder. It was not seen in the seventeenth and eighteenth centuries, when the ideal of the female body was a plump corpulence. The increasing number of boys with anorexia in the United States may be related to a growing emphasis on a muscular male physique that features little body fat (Mangweth, Hausmann, & Walch, 2004; Makino et al., 2006; Greenberg, Cwikel, & Mirsky, 2007).

Because anorexia nervosa and bulimia are products of both biological and environmental causes, treatment typically involves a mix of approaches. For instance, both psychological therapy and dietary modifications are likely to be needed for successful treatment. In more extreme cases, hospitalization may be necessary (Keel & Haedt, 2008; Stein, Latzer, & Merrick, 2009; Doyle et al., 2014).

Brain Development and Thought: Paving the Way for Cognitive Growth

LO 11.3 Summarize the ways in which the brain develops in adolescence.

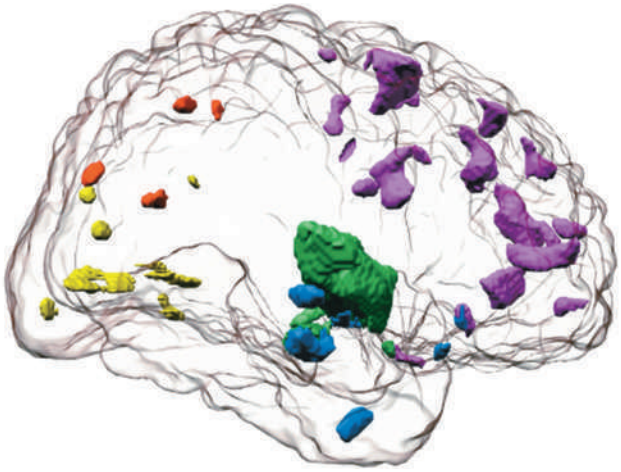
Adolescence brings greater independence. Teenagers tend to assert themselves more and more. This independence is, in part, the result of changes in the brain that pave the way for the significant advances that occur in cognitive abilities during adolescence, as we'll consider in the next part of the chapter. As the number of neurons (the cells of the nervous system) continue to grow, and their interconnections become richer and more complex, adolescent thinking also becomes more sophisticated (Toga & Thompson, 2003; Petanjek et al., 2008; Blakemore, 2012).

The brain produces an oversupply of gray matter during adolescence, which is later pruned back at the rate of 1 to 2 percent per year (see Figure 11-5). *Myelination*—the process in which nerve cells are insulated by a covering of fat cells—increases and continues to make the transmission of neural messages more efficient. Both the pruning process

Figure 11-5 Pruning Gray Matter

This three-dimensional view of the brain shows areas of gray matter that are pruned from the brain between adolescence and adulthood.

(**Source:** Sowell et al., 1999.)



and increased myelination contribute to the growing cognitive abilities of adolescents (Sowell et al., 2001; Sowell et al., 2003).

One specific area of the brain that undergoes considerable development throughout adolescence is the prefrontal cortex, which is not fully developed until around the early twenties. The *prefrontal cortex* is the part of the brain that allows people to think, evaluate, and make complex judgments in a uniquely human way. It underlies the increasingly complex intellectual achievements that are possible during adolescence.

During adolescence, the prefrontal cortex becomes increasingly efficient in communicating with other parts of the brain. This helps build a communication system within the brain that is more distributed and sophisticated, permitting the different areas of the brain to process information more effectively (Scherf, Sweeney, & Luna, 2006; Hare et al., 2008; Wiggins et al., 2014).

The prefrontal cortex also provides for impulse control. Rather than simply reacting to emotions such as anger or rage, an individual with a fully developed prefrontal cortex is able to inhibit the desire for action that stems from such emotions.

Because during adolescence the prefrontal cortex is biologically immature, the ability to inhibit impulses is not fully developed. This brain immaturity may lead to some of the risky and impulsive behaviors that are characteristic of adolescence. Furthermore, some researchers theorize that not only do adolescents underestimate the risks of risky behavior, but they also overestimate the rewards that will come from the behavior. Regardless of the causes of risk-taking in adolescents, it has led to a heated discussion of whether the death penalty should be applied to adolescents, as we discuss next (Steinberg & Scott, 2003; Casey, Jones, & Somerville, 2011; Gopnik, 2012).

THE IMMATURE BRAIN ARGUMENT: TOO YOUNG FOR THE DEATH PENALTY? Consider the following case:

> *It was a horrible crime. Seventeen-year-old Christopher Simmons, along with Charles Benjamin, 15 years old, broke into the home of a 46-year-old woman, stealing $6. They tied up the woman, put duct tape over her eyes and mouth, and dumped her into the back of her car. Then they drove to a bridge and dropped her into the river below. Her dead body was found in the river the next day. After being tracked down by the police, both confessed. (Raeburn, 2004)*

The prefrontal cortex, the area of the brain responsible for impulse control, is biologically immature during adolescence, leading to some of the risk and impulsive behavior associated with the age group.

This horrific case sent Benjamin to life in prison, and Simmons was given the death penalty. But Simmons's lawyers appealed, and ultimately the U.S. Supreme Court ruled that he—and anyone else under the age of 18—could not be executed because of their youth.

Among the facts that the Supreme Court weighed in its decision was evidence from neuroscientists and child developmentalists that the brains of adolescents are still developing in important ways and that therefore they lack judgment because of this brain immaturity. According to this reasoning, adolescents are not fully capable of making reasonable decisions because their brains are not yet wired like those of adults.

The argument that adolescents may not be as responsible for their crimes as adults stems from research showing that the brain continues to grow and mature during the teenage years, and sometimes beyond.

For example, neurons that make up unnecessary gray matter of the brain begin to disappear during adolescence. In their place, the volume of white matter of the brain begins to increase. The decline in gray matter and the increase in white matter permit more sophisticated, thoughtful cognitive processing (Beckman, 2004; Ferguson, 2013; Maier-Hein et al., 2014).

Are the brains of adolescents so immature that teenage offenders should receive less harsh punishment for their crimes than those with older, and therefore more mature, brains? It is not a simple question, and the answer probably will come more from those studying morality than from scientists (Aronson, 2007).

SLEEP DEPRIVATION. With increasing academic and social demands placed on them, adolescents go to bed later and get up earlier. As a result, they often lead their lives in something of a sleep-deprived daze.

The sleep deprivation comes at a time when adolescents' internal clocks shift. Older adolescents in particular experience the need to go to bed later and to sleep later in the morning, and they require nine hours of sleep each night to feel rested. Yet half of adolescents sleep seven hours or less each night, and almost one in five gets less than six hours. Because they typically have early morning classes but don't feel sleepy until late at night, they end up getting far less sleep than their bodies crave (Loessl et al., 2008; Wolfson & Richards, 2011; Dagys et al., 2012).

Sleep deprivation takes its toll. Sleepy teens have lower grades, are more depressed, and have greater difficulty controlling their moods. In addition, they are at great risk for car accidents (Roberts, Roberts, & Duong, 2009; Roberts, Roberts, & Xing, 2011; Louca & Short, 2014).

Module 11.1 Review

- Adolescence is a period of rapid physical growth, including the changes associated with puberty. Puberty can cause reactions in adolescents ranging from confusion to increased self-esteem. Early or late maturation can bring advantages and disadvantages, depending on gender as well as emotional and psychological maturity.
- Adequate nutrition is essential in adolescence because of the need to fuel physical growth. Changing physical needs and environmental pressures can induce obesity or eating disorders. The two most common eating disorders are anorexia nervosa and bulimia. Both must be treated with a combination of physical and psychological therapies.
- Brain development paves the way for significant cognitive growth, although the brain is not fully developed until the early 20s.

Journal Writing Prompt

Applying Lifespan Development: How can societal and environmental influences contribute to the emergence of an eating disorder?

Cognitive Development and Schooling

Ms. Mejia smiled as she read a particularly creative paper. As part of her eighth-grade American Government class every year, she asked students to write about what their lives would be like if America had not won its war for independence from Britain. She had tried something similar with her sixth-graders, but many of them seemed unable to imagine anything different from what they already knew. By eighth grade, however, they were able to come up with some very interesting scenarios. One boy imagined that he would be known as Lord Lucas; a girl imagined that she would be a servant to a rich landowner; another, that she would be helping to plot an overthrow of the government.

What is it that sets adolescents' thinking apart from that of younger children? One of the major changes is the ability to think beyond the concrete, current situation to what *might* or *could* be. Adolescents are able to keep a variety of abstract possibilities in their heads, and they can see issues in relative, as opposed to absolute, terms. Instead of viewing

problems as having black-and-white solutions, they are capable of perceiving shades of gray.

Once again we can use several approaches to explain adolescents' cognitive development. We'll begin by returning to Piaget's theory, which has had a significant influence on how developmentalists think about thinking during adolescence.

Piagetian Approaches to Cognitive Development: Using Formal Operations

LO 11.4 Describe how cognitive development proceeds during adolescence according to Piaget.

Fourteen-year-old Leigh is asked to solve a problem that anyone who has seen a grandfather's clock may have pondered: What determines the speed at which a pendulum moves back and forth? In the version of the problem that she is asked to solve, Leigh is given a weight hanging from a string. She is told that she can vary several things: the length of the string, the weight of the object at the end of the string, the amount of force used to push the string, and the height to which the weight is raised in an arc before it is released.

Leigh doesn't remember, but she was asked to solve the same problem when she was eight years old, as part of a longitudinal research study. At that time, she was in the concrete operational period, and her efforts to solve the problem were not very successful. She approached the problem haphazardly, with no systematic plan of action. For instance, she simultaneously tried to push the pendulum harder *and* shorten the length of the string *and* increase the weight on the string. Because she was varying so many factors at once, when the speed of the pendulum changed she had no way of knowing which factor or factors made a difference.

Now, however, Leigh is much more systematic. Rather than immediately beginning to push and pull at the pendulum, she stops a moment and thinks about what factors to take into account. She considers how she might test which of those factors is important, forming a hypothesis about which is most important. Then, just like a scientist conducting an experiment, she varies only one factor at a time. By examining each variable separately and systematically, she is able to come to the correct solution: The length of the string determines the speed of the pendulum.

formal operational stage
the stage at which people develop the ability to think abstractly

Like scientists who form hypotheses, adolescents in the formal operational stage use systematic reasoning. They start with a general theory about what produces a particular outcome and then deduce explanations for specific situations in which they see that particular outcome.

USING FORMAL OPERATIONS TO SOLVE PROBLEMS. Leigh's approach to the pendulum question, a problem devised by Piaget, illustrates that she has moved into the formal operational period of cognitive development (Piaget & Inhelder, 1958). The **formal operational stage** is the stage at which people develop the ability to think abstractly. Piaget suggested that people reach this stage at the start of adolescence, around the age of 12. Leigh was able to think about the various aspects of the pendulum problem in an abstract manner and to understand how to test out the hypotheses that she had formed.

By bringing formal principles of logic to bear on problems they encounter, adolescents are able to consider problems in the abstract rather than only in concrete terms. They are able to test their understanding by systematically carrying out rudimentary experiments on problems and situations, and observing what their experimental "interventions" bring about.

Adolescents are able to use formal reasoning, in which they start with a general theory about what produces a particular outcome and then deduce explanations for specific situations in which they see that particular outcome. Like the scientists who form hypotheses that we discussed in Chapter 1, they can then test their theories. What distinguishes this kind of thinking from earlier cognitive stages is the ability to start with abstract possibilities and move to the concrete; in previous stages, children are tied to the concrete here and now. For example, at age eight, Leigh just started moving things around to see what would happen in the pendulum problem, a concrete approach. At age 12, however, she started with the abstract idea that each variable—the string, the size of the weight, and so forth—should be tested separately.

Adolescents also are able to employ propositional thought during the formal operational stage. *Propositional thought* is reasoning that uses abstract logic in the absence of concrete examples. For example, propositional thinking allows adolescents to understand that if certain premises are true, then a conclusion must also be true. For example, consider the following:

All teachers are mortal.	*[premise]*
Ms. Gonzales is a teacher.	*[premise]*
Therefore, Ms. Gonzales is mortal.	*[conclusion]*

Not only can adolescents understand that if both premises are true, then so is the conclusion, but they are also capable of using similar reasoning when premises and conclusions are stated more abstractly, as follows:

All As are B.	*[premise]*
C is an A.	*[premise]*
Therefore, C is a B.	*[conclusion]*

Although Piaget proposed that children enter the formal operational stage at the beginning of adolescence, you may recall that he also hypothesized that—as with all the stages of cognitive development—full capabilities do not emerge suddenly, at one stroke. Instead, they gradually unfold through a combination of physical maturation and environmental experiences. According to Piaget, it is not until adolescents are around 15 years old that they are fully settled in the formal operational stage.

Some evidence suggests that a sizable proportion of people hone their formal operational skills at a later age, and in some cases, never fully employ formal operational thinking at all. For instance, most studies show that only 40 to 60 percent of college students and adults achieve formal operational thinking completely, and some estimates run as low as 25 percent. But many of those adults who do not show formal operational thought in every domain are fully competent in *some* aspects of formal operations (Sugarman, 1988; Keating, 1990, 2004).

One of the reasons adolescents differ in their use of formal operations relates to the culture in which they were raised. For instance, people who live in isolated, scientifically unsophisticated societies and who have little formal education are less likely to perform at the formal operational level than formally educated persons living in more technologically sophisticated societies (Segall et al., 1990; Commons, Galaz-Fontes, & Morse, 2006; Asadi, Amiri, & Molavi, 2014).

Does this mean that adolescents (and adults) from cultures in which formal operations tend not to emerge are incapable of attaining them? Not at all. A more probable conclusion is that the scientific reasoning that characterizes formal operations is not equally valued in all societies. If everyday life does not require or promote a certain type of reasoning, it is unreasonable to expect people to employ that type of reasoning when confronted with a problem (Gauvain, 1998).

THE CONSEQUENCES OF ADOLESCENTS' USE OF FORMAL OPERATIONS. Adolescents' ability to reason abstractly, embodied in their use of formal operations, leads to a change in their everyday behavior. Whereas earlier they may have unquestioningly accepted rules and explanations set out for them, their increased abstract reasoning abilities may lead them to question their parents and other authority figures far more strenuously. Advances in abstract thinking also lead to greater idealism, which may make adolescents impatient with imperfections in institutions, such as schools and the government.

In general, adolescents become more argumentative. They enjoy using abstract reasoning to poke holes in others' explanations, and their increased abilities to think critically make them acutely sensitive to parents' and teachers' perceived shortcomings. For instance, they may note the inconsistency in their parents' arguments against using drugs, such as when they know that their parents used drugs when they were adolescents and nothing much came of it. At the same time, adolescents can be indecisive, as they are able to see the merits of multiple sides to issues (Elkind, 1996; Alberts, Elkind, & Ginsberg, 2007).

Coping with the increased critical abilities of adolescents can be challenging for parents, teachers, and other adults who deal with adolescents. But it also makes adolescents more interesting, as they actively seek to understand the values and justifications that they encounter in their lives.

EVALUATING PIAGET'S APPROACH. Each time we've considered Piaget's theory in previous chapters, several concerns have cropped up. Let's summarize some of the issues here:

- Piaget suggests that cognitive development proceeds in universal, step-like advances that occur at particular stages. Yet we find significant differences in cognitive abilities from one person to the next, especially when we compare individuals from different cultures. Furthermore, we find inconsistencies even within the same individual. People may be able to accomplish some tasks that indicate they have reached a certain level of thinking, but not other tasks. If Piaget were correct, a person ought to perform uniformly well once she or he reaches a given stage (Siegler, 1994).
- The notion of stages proposed by Piaget suggests that cognitive abilities do not grow gradually or smoothly. Instead, the stage point of view implies that cognitive growth is typified by relatively rapid shifts from one stage to the next. In contrast, many developmentalists argue that cognitive development proceeds in a more continuous fashion, increasing not so much in qualitative leaps forward as in quantitative accumulations. They also contend that Piaget's theory is better at *describing* behavior at a given stage than *explaining* why the shift from one stage to the next occurs (Case, 1999).
- Because of the nature of the tasks Piaget employed to measure cognitive abilities, critics suggest that he underestimated the age at which certain capabilities emerge. It is now widely accepted that infants and children are more sophisticated at an earlier age than Piaget asserted (Bornstein & Lamb, 2005; Kenny, 2013).
- Piaget had a relatively narrow view of what is meant by *thinking* and *knowing*. To Piaget knowledge consists primarily of the kind of understanding displayed in the pendulum problem. However, as we discussed in Chapter 9, developmentalists such as Howard Gardner suggest that we have many kinds of intelligence, separate from and independent of one another (Gardner, 2000, 2006).
- Finally, some developmentalists argue that formal operations do not represent the epitome of thinking and that more sophisticated forms of thinking do not actually emerge until early adulthood. For instance, developmental psychologist Giesela Labouvie-Vief (1980, 1986) argues that the complexity of society requires thought that is not necessarily based on pure logic. Instead, a kind of thinking is required that

is flexible, allows for interpretive processes, and reflects the fact that reasons behind events in the real world are subtle—something that Labouvie-Vief calls *postformal thinking* (Labouvie-Vief & Diehl, 2000).

On one hand, these criticisms and concerns regarding Piaget's approach to cognitive development have considerable merit. On the other hand, Piaget's theory has been the impetus for an enormous number of studies on the development of thinking capacities and processes, and it also spurred a good deal of classroom reform. Finally, his bold statements about the nature of cognitive development provided a fertile soil from which many opposing positions on cognitive development bloomed, such as the information processing perspective, to which we turn next (Taylor & Rosenbach, 2005; Kuhn, 2008; Bibace, 2013).

Information Processing Perspectives: Gradual Transformations in Abilities

LO 11.5 Summarize how information processing approaches explain adolescent cognitive development.

From the perspective of proponents of information processing approaches to cognitive development, adolescents' mental abilities grow gradually and continuously. Unlike Piaget's view that the increasing cognitive sophistication of the adolescent is a reflection of stage-like spurts, the **information processing perspective** sees changes in adolescents' cognitive abilities as evidence of gradual transformations in the capacity to take in, use, and store information. A number of progressive changes occur in the ways people organize their thinking about the world, develop strategies for dealing with new situations, sort facts, and achieve advances in memory capacity and perceptual abilities (Pressley & Schneider, 1997; Wyer, 2004).

information processing perspective
the model that seeks to identify the way that individuals take in, use, and store information

Adolescents' general intelligence—as measured by traditional IQ tests—remains stable, but there are dramatic improvements in the specific mental abilities that underlie intelligence. Verbal, mathematical, and spatial abilities increase, making many adolescents quicker with a comeback, impressive sources of information, and accomplished athletes. Memory capacity grows, and adolescents become more adept at effectively dividing their attention across more than one stimulus at a time—such as simultaneously studying for a biology test and listening to music.

Furthermore, as Piaget noted, adolescents grow increasingly sophisticated in their understanding of problems, their ability to grasp abstract concepts and to think hypothetically, and their comprehension of the possibilities inherent in situations. This permits them, for instance, to endlessly dissect the course that their relationships might hypothetically take.

Adolescents know more about the world, too. Their store of knowledge increases as the amount of material to which they are exposed grows and their memory capacity enlarges. Taken as a whole, the mental abilities that underlie intelligence show a marked improvement during adolescence (Kail, 2004; Kail & Miller, 2006; Atkins et al., 2012).

According to information processing explanations of cognitive development during adolescence, one of the most important reasons for advances in mental abilities is the growth of metacognition. **Metacognition** is the knowledge that people have about their own thinking processes and their ability to monitor their cognition. Although school-age children can use some metacognitive strategies, adolescents are much more adept at understanding their own mental processes.

metacognition
the knowledge that people have about their own thinking processes and their ability to monitor their cognition

For example, as adolescents improve their understanding of their memory capacity, they get better at gauging how long they need to study a particular kind of material to memorize it for a test. Furthermore, they can judge when they have fully memorized the material considerably more accurately than when they were younger. These improvements in metacognitive abilities permit adolescents to comprehend and master school

Adolescents' ability to reason abstractly leads them to question accepted rules and explanations.

material more effectively (Desoete, Roeyers, & De Clercq, 2003; Dimmit & McCormick, 2012; Martins et al., 2013; Thielsch, Andor, & Ehring, 2015).

These new abilities also can make adolescents particularly introspective and self-conscious—two hallmarks of the period, which, as we see next, may produce a high degree of egocentrism.

Egocentrism in Thinking: Adolescents' Self-Absorption

LO 11.6 Describe how adolescent egocentrism affects thinking and behavior.

Carlos thinks of his parents as "control freaks"; he cannot figure out why his parents insist that when he borrows their car, he call home and let them know where he is. Jeri is thrilled that Molly bought earrings just like hers, thinking it is the ultimate compliment, even though it's not clear that Molly even knew that Jeri had a similar pair when she bought them. Lu is upset with his biology teacher, Ms. Sebastian, for giving a long, difficult midterm exam on which he didn't do well.

Adolescents' newly sophisticated metacognitive abilities enable them to readily imagine that others are thinking about them, and they may construct elaborate scenarios about others' thoughts. It is also the source of the egocentrism that sometimes dominates adolescents' thinking. **Adolescent egocentrism** is a state of self-absorption in which the world is viewed as focused on oneself. This egocentrism makes adolescents highly critical of authority figures such as parents and teachers, unwilling to accept criticism, and quick to find fault with others' behavior (Schwartz, Maynard, & Uzelac, 2008; Inagaki, 2013; Rai et al., 2014).

adolescent egocentrism
a state of self-absorption in which the world is viewed as focused on oneself

From *a social worker's* perspective

In what ways does adolescent egocentrism complicate adolescents' social and family relationships? Do adults entirely outgrow egocentrism and personal fables?

The kind of egocentrism we see in adolescence helps explain why adolescents sometimes perceive that they are the focus of everyone else's attention. Adolescents may develop what has been called an **imaginary audience**, fictitious observers who pay as much attention to the adolescents' behavior as adolescents do themselves.

imaginary audience
an adolescent's belief that his or her own behavior is a primary focus of others' attentions and concerns

The imaginary audience is usually perceived as focusing on the one thing that adolescents think most about: themselves. Unfortunately, these scenarios may suffer from the same kind of egocentrism as the rest of their thinking. For instance, a student sitting in a class may be sure a teacher is focusing on her, and a teenager at a basketball game is likely to be convinced that everyone around is focusing on the pimple on his chin.

Egocentrism leads to a second distortion in thinking: the notion that one's experiences are unique. Adolescents develop **personal fables**, the view that what happens to them is unique, exceptional, and shared by no one else. For instance, teenagers whose romantic relationships have ended may feel that no one has ever experienced the hurt they feel, that no one has ever been treated so badly, that no one can understand what they are going through (Alberts, Elkind, & Ginsberg, 2007).

personal fables
the view held by some adolescents that what happens to them is unique, exceptional, and shared by no one else

Personal fables may also make adolescents feel invulnerable to the risks that threaten others. Much of adolescents' risk-taking may well be traced to the personal fables they construct for themselves. They may think that there is no need to use condoms during sex because, in the personal fables they construct, pregnancy and sexually transmitted infections such as AIDS only happen to other kinds of people, not to them. They may

drive after drinking because their personal fables paint them as careful drivers, always in control (Greene et al., 2000; Vartanian, 2000; Reyna & Farley, 2006).

School Performance

LO 11.7 Analyze the factors that affect adolescent school performance.

Do the advances that occur in metacognition, reasoning, and other cognitive abilities during adolescence translate into improvements in school performance? If grades are used as the measure, the clear answer is yes. Grades awarded to high school students have shifted upward in the last decade. The mean grade point average for college-bound seniors was 3.3 (on a scale of 4), compared with 3.1 a decade ago. More than 40 percent of seniors reported average grades of A+, A, or A– (College Board, 2005).

At the same time, however, independent measures of achievement, such as SAT scores, have not risen. Consequently, a more likely explanation for the higher grades is the phenomenon of grade inflation. According to this view, it is not that students have changed. Instead, instructors have become more lenient, awarding higher grades for the same performance (Cardman, 2004).

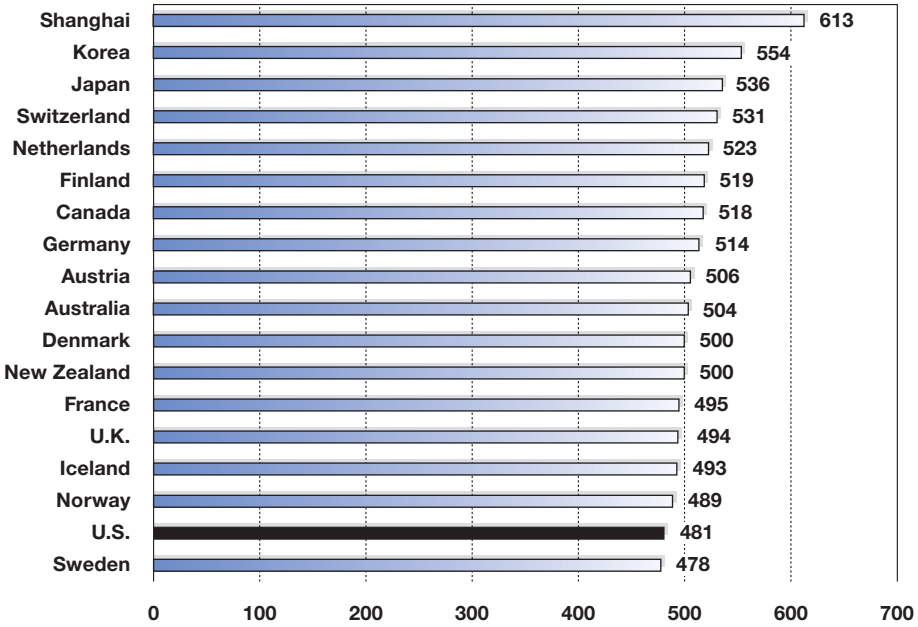
Further evidence for grade inflation comes from the relatively poor achievement of students in the United States when compared to students in other countries. For instance, students in the United States score lower on standardized math and science tests when compared to students in many other industrialized countries (see Figure 11-6; OECD, 2014).

Adolescents' egocentrism affects their thinking and behavior.

Figure 11-6 U.S. Math Performance Compared with Other Countries

When compared to the math performance of students across the world, U.S. students perform at below-average levels.

(**Source:** Based on OECD, 2014.)



There is no single reason for this gap in the educational achievement of U.S. students, but a combination of factors, such as less time spent in classes and less intensive instruction, are at work. Furthermore, the broad diversity of the U.S. school population may affect performance relative to other countries, in which the population attending school is more homogeneous and affluent (Stedman, 1997; Schemo, 2001).

The poorer accomplishments of U.S. students is also reflected in high school graduation rates. Although the United States once stood first in the percentage of the population graduating from high school, it has dropped to twenty-fourth among industrialized countries. Only 79 percent of U.S. high school students graduate—a rate considerably lower than those of other developed countries. Certainly, as we discuss next, differences in socioeconomic status are reflected in school performance within the United States (Stedman, 1997; Schemo, 2001; OECD, 2001, 2014).

SOCIOECONOMIC STATUS AND SCHOOL PERFORMANCE: INDIVIDUAL DIFFERENCES IN ACHIEVEMENT. All students are entitled to the same opportunity in the classroom, but it is very clear that certain groups have more educational advantages than others. One of the most telling indicators of this reality is the relationship between educational achievement and socioeconomic status (SES).

Middle- and high-SES students, on average, earn higher grades, score higher on standardized tests of achievement, and complete more years of schooling than students from lower-SES homes. Of course, this disparity does not start in adolescence; the same findings hold for children in lower grades. However, by the time students are in high school, the effects of socioeconomic status become even more pronounced (Shernoff & Schmidt, 2008; Tucker-Drob & Harden, 2012; Roy & Raver, 2014).

Why do students from middle- and high-SES homes show greater academic success? There are several reasons. For one thing, children living in poverty lack many of the advantages enjoyed by other children. Moreover, their nutrition and health may be less adequate. Often living in crowded conditions and attending inadequate schools, they may have few places to do homework. Their homes may lack the books and computers commonplace in more economically advantaged households (Prater, 2002; Chiu & McBride-Chang, 2006).

For these reasons, students from impoverished backgrounds may be at a disadvantage from the day they begin their schooling. As they grow older, their school performance may continue to lag, and their disadvantage may snowball. Because later school success builds heavily on basic skills presumably learned early in school, children who experience early problems may find themselves falling increasingly behind the academic eight ball as adolescents (Phillips et al., 1994; Biddle, 2001; Hoff, 2012).

ETHNIC AND RACIAL DIFFERENCES IN SCHOOL ACHIEVEMENT. Achievement differences between ethnic and racial groups are significant, and they paint a troubling picture of American education. For instance, data on school achievement indicate that, on average, African American and Hispanic students tend to perform at lower levels, receive lower grades, and score lower on standardized tests of achievement than Caucasian students. In contrast, Asian American students tend to receive higher grades than Caucasian students (Shernoff & Schmidt, 2008; Byun & Park, 2012; Kurtz-Costes, Swinton, & Skinner, 2014).

What is the source of such ethnic and racial differences in academic achievement? Clearly, much of the difference is due to socioeconomic factors: Because a higher proportion of African American and Hispanic families live in poverty than the proportion of whites, their economic disadvantage may be reflected in their school performance. When we take socioeconomic levels into account by comparing different ethnic and racial groups at the same socioeconomic level, achievement differences diminish, but they do not vanish (Meece & Kurtz-Costes, 2001; Cokley, 2003; Guerrero et al., 2006).

From *an educator's* perspective

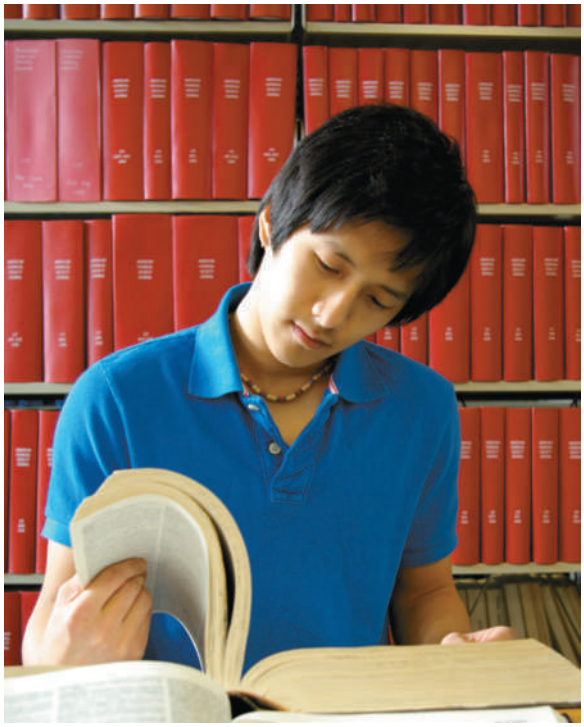
Why might descendants of people who were forced to immigrate to a country be less successful academically than those who came voluntarily? What approaches might be used to overcome this obstacle?

Anthropologist John Ogbu (1988, 1992) argues that members of certain minority groups may perceive school success as relatively unimportant. They may believe that societal prejudice in the workplace will dictate that they will not succeed, no matter how much effort they expend. Their conclusion is that hard work in school will have no eventual payoff.

Ogbu suggests that members of minority groups who enter a new culture voluntarily are more likely to be successful in school than those who are brought into a new culture against their will. For instance, he notes that Korean children who are the sons and daughters of voluntary immigrants to the United States tend to be, on average, quite successful in school. But Korean children in Japan, whose parents were forced to immigrate during World War II and work as forced laborers, tend to do relatively poorly in school. The reason for the disparity? The process of involuntary immigration apparently leaves lasting scars, reducing the motivation to succeed in subsequent generations. Ogbu suggests that in the United States, the involuntary immigration, as slaves, of the ancestors of many African American students might be related to their motivation to succeed (Ogbu, 1992; Gallagher, 1994).

Another factor in the differential success of various ethnic and racial group members has to do with attributions for academic success. As we discussed in Chapter 10, students from many Asian cultures tend to view achievement as the consequence of temporary situational factors, such as how hard they work. In contrast, African American students are more apt to view success as the result of external causes over which they have no control, such as luck or societal biases. Students who subscribe to the belief that effort will lead to success, and then expend that effort, are more likely to do better in school than students who believe that effort makes less of a difference (Stevenson, Chen, & Lee, 1992; Fuligni, 1997; Saunders, Davis, & Williams, 2004).

Concerns about the educational performance of students have led to considerable efforts to improve schooling. No educational reform has had greater impact than the *No Child Left Behind Act*, as we discuss next.



John Ogbu notes that Korean children whose parents emigrated voluntarily to the United States do better in school than their counterparts in Japan whose parents were forced to emigrate from Korea to Japan during WWII.

ACHIEVEMENT TESTING IN HIGH SCHOOL: WILL NO CHILD BE LEFT BEHIND?

> *Duong Nghe Ly understood that violence was part of the South Philadelphia High School culture. The previous year saw 45 dangerous incidents, such as assaults and weapons possession, and 326 lesser crimes. Finally, after years of threats and slurs, a group of students "went hunting" for Asians and ended up brutally attacking one of Ly's friends in a classroom. Fed up, Ly and 50 other Asian students boycotted school for a week to focus attention on the problem.*

Can schools like this be turned around, providing not only a safe environment but also one that provides an excellent education for every student? Most definitely, according to the thinking behind the passage of the No Child Left Behind Act, a comprehensive law designed to improve school performance across the United States.

The No Child Left Behind Act, passed by Congress in 2002, requires that every U.S. state design and administer achievement tests that students must pass in order to graduate from high school. In addition, schools themselves are graded so that the public is aware of which schools have the best (and worst) test results. The basic idea behind

mandatory testing programs like the No Child Left Behind Act is to ensure that students graduate with a minimum level of proficiency. Proponents suggest that students—and teachers—will be motivated by the tests and that overall educational standards will be raised (Watkins, 2008; Opfer, Henry, & Mashburn, 2008; Cook, Wong & Steiner, 2012).

Critics of the Act (and other forms of mandatory standardized testing) argue that implementation of the law will have a number of unintended negative consequences. They suggest that to ensure that the maximum numbers of students pass the tests, instructors will "teach to the test," meaning that they will focus on the content of the tests to the exclusion of material that is not test biased. In this view, approaches to teaching designed to foster creativity and critical thinking may be discouraged by emphasis on testing (Thurlow, Lazarus, & Thompson, 2005; Linn, 2008; Koretz, 2008).

In addition, mandatory high-stakes tests raise the anxiety level for students, potentially leading to poor performance, and students who might have performed well throughout their schooling face the possibility of not graduating if they do poorly on the test. Moreover, because students from lower socioeconomic and ethnic and racial minority backgrounds and those with special needs fail tests disproportionately, critics have argued that mandatory testing programs may be inherently biased (Samuels, 2005; Yeh, 2008).

Because of problems with the law, many states have been exempted from its toughest requirements, and the U.S. Congress is discussing ways of improving the law. Although the No Child Left Behind Act has been controversial from the time of its passage, one part of the law has received nearly universal approval. Specifically, the law provides funding to help determine what educational practices and programs have been proven to be effective based on scientific research. Although there is disagreement over what constitutes "proof" of best educational practices, developmental and educational researchers have welcomed the emphasis on the use of objective data (Chatterji, 2004; Sunderman, 2008; Blankinship, 2012). (Also see the *From Research to Practice* box.)

From Research to Practice

Do Video Games Improve Cognitive Ability?

Although considerable research suggests that there are harmful effects of playing violent video games, there are many kinds of effects that video games can have. In fact, some researchers believe that the focus on aggressive behaviors has obscured the possibility that playing video games can have beneficial consequences as well. More recent research holds out promise that this indeed may be the case (Granic, Lobel, & Engels, 2014).

Far from the mind-numbing activity that some people accuse it of being, playing video games is in fact cognitively stimulating. This is true even of the violent type of action or "shooter" video games. When participants who are not game players were randomly assigned to play either a shooter or non-shooter type of video game, those who played the shooter game showed improvements in attention, visual processing, and mental rotation abilities. A comprehensive meta-analysis showed that these kinds of games produce improvements in spatial skills that are comparable to formal spatial-skill training and are furthermore quickly acquired, relatively long-lasting, and transferrable to other kinds of tasks. These kinds of skills predict future achievement in science, technology, engineering, and math careers, and ironically, they are not enhanced by playing puzzle-solving or other types of non-shooter games. It seems that the fast paced, split-second decision making, and immersive three-dimensional environments of shooter games play a pivotal role in the cognitive enhancement effect (Wait et al., 2010; Green & Bavelier, 2012; Uttal et al., 2013).

Other kinds of cognitive enhancements can come from video game play as well. Most games involve problem solving of some kind, so it's not much of a leap to hypothesize that they may enhance problem-solving skills. The research so far is very limited, but promising: One study has shown that playing strategic-type games produced improved self-reported problem-solving skills the following year. While certainly more research needs to be done, it's clear that video games may have as much potential to be helpful to children as well as harmful (Adachi & Willoughby, 2013).

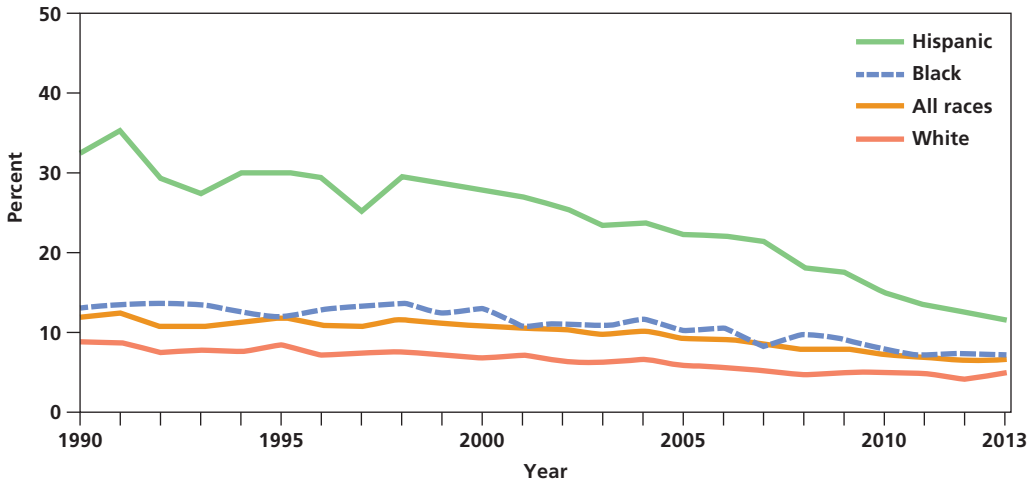
Shared Writing Prompt

Do you think that the benefits of playing shooter-type video games justify the problems of exposing adolescents to their violent content? Why or why not?

Figure 11-7 Dropout Rates of 16- through 24-Year-Olds by Race/Ethnicity: 1990–2013

Dropout rates have generally declined in the past 25 years, particularly for Hispanics.

(**Source:** U.S. Department of Education, 2015.)



DROPPING OUT OF SCHOOL. Most students complete high school, but each year some half million students drop out prior to graduating. The consequences of dropping out are severe. High school dropouts earn 42 percent less than high school graduates, and the unemployment rate for dropouts is 50 percent.

Adolescents who leave school do so for a variety of reasons. Some leave because of pregnancy or problems with the English language. Others must leave for economic reasons, needing to support themselves or their families.

Dropout rates differ according to gender and ethnicity. Males are more likely to drop out of school than females. In addition, although the dropout rate for all ethnicities has been declining somewhat over the last two decades, particularly for Hispanics, there are still discrepancies according to race (see Figure 11-7). Not all minority groups, however, show higher dropout rates: Asians, for instance, drop out at a lower rate than Caucasians (National Center for Educational Statistics, 2003; Stearns & Glennie, 2006; U.S. Department of Education, 2015).

Poverty plays a large role in determining whether a student completes high school. Students from lower-income households are three times more likely to drop out than those from middle- and upper-income households. Because economic success is so dependent on education, dropping out often perpetuates a cycle of poverty (National Center for Educational Statistics, 2002).

Cyberspace: Adolescents Online

LO 11.8 Describe how adolescents use the Internet.

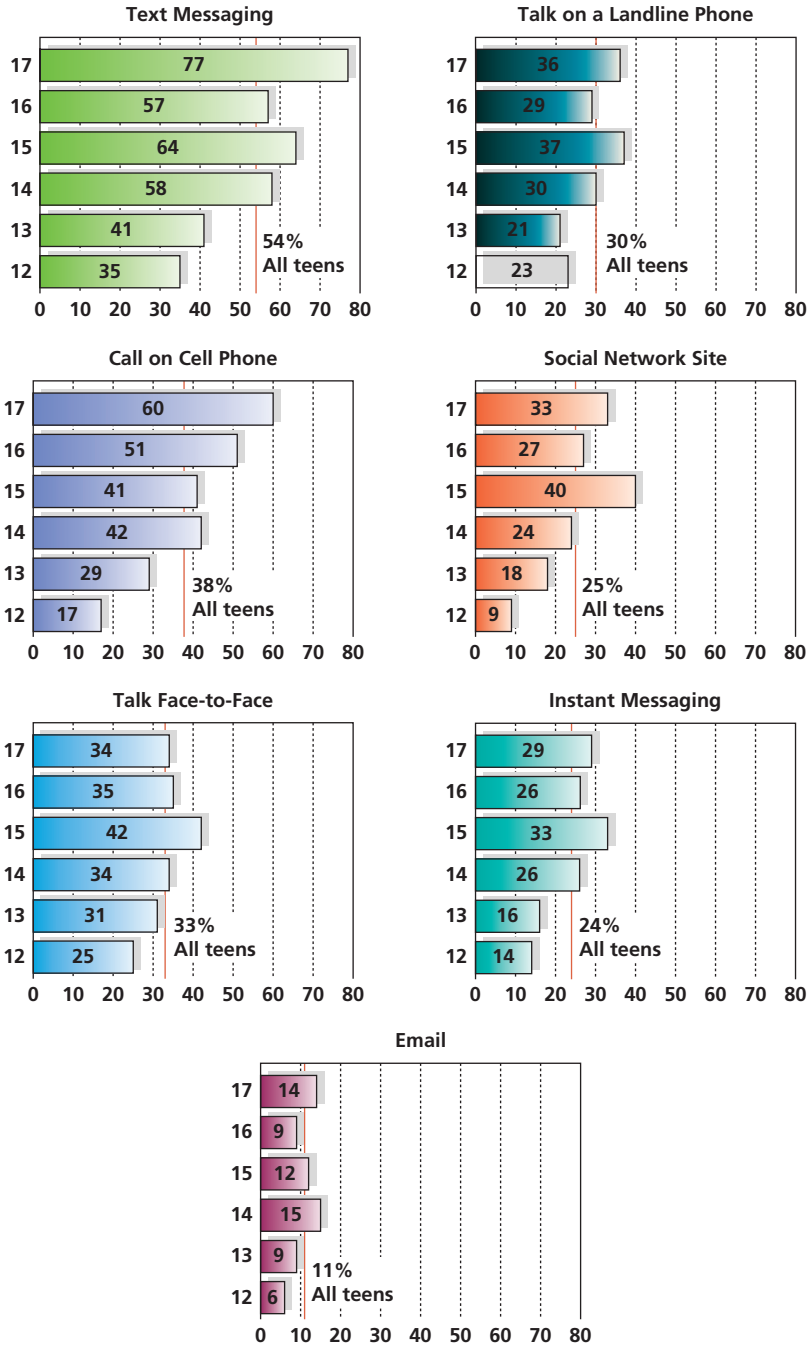
> *Prakash Subhani faces a choice: study for his chemistry final or check out Facebook. Prakash needs to do well on the test to raise his grade. But he also needs to keep up with his friends in India. Finally, he decides to compromise. He'll spend a half hour on Facebook and devote the rest of the night to study. But the next time he looks at his watch, nearly four hours have passed and he is too tired to study. Prakash has to face his chemistry test unprepared.*

Like Prakash Subhani, most adolescents make use of social media and other technologies to a staggering degree. In fact, according to a comprehensive survey using a sample of boys and girls 8 to 18 years old conducted by the Kaiser Family Foundation (a well-respected think tank), young people spend an average of 6.5 hours a day with media.

Figure 11-8 Teenagers, Cell Phones, and Texting

As they get older, the percentage of teenagers who text their friends daily generally rises.

(**Source:** Pew Research Center, 2010.)



Furthermore, because for around a quarter of the time they are using more than one form of medium simultaneously, they are actually being exposed to the equivalent of 8.5 hours per day (Boneva et al., 2006; Jordan et al., 2007).

The amount of media use can be extraordinary. For example, some teenagers send nearly 30,000 texts a month, often carrying on multiple conversations simultaneously. The use of texting often supplants other forms of social interaction, such as telephone calls or even face-to-face interaction (Lenhart, 2010; Richtel, 2010; see Figure 11-8).

Some forms of online activities can be mean-spirited. For example, some teenagers make use of the web to bully others—a process in which victims are repeatedly texted or emailed with hurtful messages. The source of such *cyberbullying* can remain anonymous, and the messages may be particularly abusive. Although they do not inflict physical harm, they can be psychologically damaging (Zacchilli & Valerio, 2011; Best, Manktelow, & Taylor, 2014).

MEDIA AND EDUCATION. The widespread availability of the web also has produced considerable changes in education, allowing adolescents to tap into a vast array of information. However, it is not yet obvious how web access will change education or whether the impact will be uniformly positive. For instance, schools must change their curricula to include specific instruction in a key skill for deriving value from the web: learning to sort through huge bodies of information to identify what is most useful and discard what is not. To obtain the full benefits of the web, then, students must obtain the ability to search, choose, and integrate information in order to create new knowledge (Trotter, 2004; Guilamo-Ramos et al., 2015).

Despite the substantial benefits of the web, its use also has a downside. Claims that cyberspace is overrun with child molesters may be exaggerated, but it is true that cyberspace makes available material that many parents and other adults find highly objectionable. In addition, there is a growing problem of online gambling. High school and college students can easily bet on sports events and participate in games, such as poker on the web using credit cards (Winters, Stinchfield, & Botzet, 2005; Fleming et al., 2006; Mitchell, Wolak, & Finkelhor, 2007).

The growing use of computers also presents a challenge involving socioeconomic status, race, and ethnicity. Poorer adolescents and members of minority groups have less

access to computers than more affluent adolescents and members of socially advantaged groups—a phenomenon known as the *digital divide*. For example, 77 percent of black students reported using a personal computer frequently, compared with 87 percent of white students and 81 percent of Hispanic/Latino students. Asian American students had the highest rate of use, at 91.2 percent. How society reduces these discrepancies is a matter of considerable importance. Furthermore, only 18 percent of teachers believe that their students have the digital resources available to complete assignments at home (Fetterman, 2005; Olsen, 2009; Purcell et al., 2013).

Module 11.2 Review

- Adolescence corresponds to Piaget's formal operations period, a stage characterized by abstract reasoning and an experimental approach to problems.
- According to the information processing perspective, the cognitive advances of adolescence are quantitative and gradual, involving improvements in many aspects of thinking and memory. Improved metacognition enables the monitoring of thought processes and of mental capacities.
- Adolescents are susceptible to adolescent egocentrism and the perception that an imaginary audience is constantly observing their behavior. They also construct personal fables that stress their uniqueness and immunity to harm.
- Academic performance is linked in complex ways to socioeconomic status and to race and ethnicity.
- Adolescents spend a great deal of time online interacting with friends, finding information, and entertaining themselves. Internet-related concerns focus on unequal access to computers, called the digital divide, and the misuse of social media for cyberbullying.

Journal Writing Prompt

Applying Lifespan Development: When faced with complex problems, such as what kind of computer or car to buy, do you think most adults spontaneously apply formal operations like those used to solve the pendulum problem? Why or why not?

Threats to Adolescents' Well-Being

It took a car crash to wake Tom Jansen up—literally and figuratively. The police called at 12:30 a.m. and told him to pick up his 13-year-old daughter Roni at the hospital. The accident wasn't serious, but what Tom learned that night might have saved Roni's life. The police found alcohol on her breath and on that of every other occupant of the car, including the driver.

Tom always knew that someday he'd have to have the "alcohol and drug talk" with Roni, but he had hoped it would be in high school, not middle school. Thinking back, he now saw that he had been wrong to chalk up the classic signs of a drug or alcohol problem—school absences, declining grades, general listlessness—to "adolescent angst." It was time to face facts.

He and Roni met with a counselor weekly for several months. At first Roni was hostile, but one evening she started sobbing while they were doing the dishes. Tom simply held her, never saying a word. But from that moment, he knew his Roni was back.

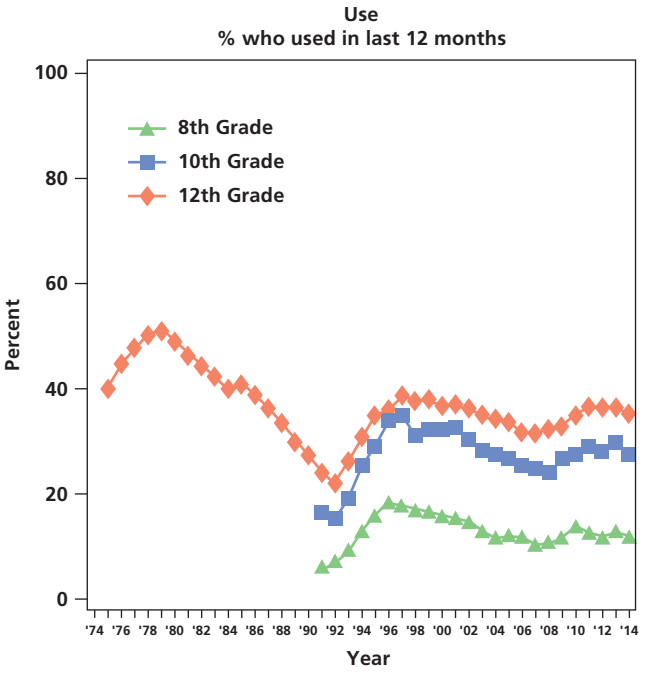
Tom Jansen learned that alcohol was not the only drug Roni was using. As her friends later admitted, Roni had all the signs of becoming what they called a "garbage head"—someone who would try anything. Had the accident never happened, Roni might have gotten into very serious trouble or even lost her life.

Few cases of adolescent alcohol use produce such extreme results, but the use of alcohol, as well as other kinds of substance use and abuse, is one of several kinds of threats to health during adolescence, usually one of the healthiest periods of life. While the extent of risky behavior is difficult to gauge, preventable problems, such as drug, alcohol, and tobacco use, as well as sexually transmitted infections, represent serious threats to adolescents' health and well-being.

Figure 11-9 Marijuana Use Remains Steady

According to an annual survey, the proportion of students reporting marijuana use over the past 12 months has remained steady at fairly high levels.

(**Source:** http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2014.pdf p. 13.)



Illegal Drugs

LO 11.9 Analyze what illegal drugs adolescents use and why.

How common is illegal drug use during adolescence? Very. For example, 1 in 15 high school seniors smokes marijuana on a daily or near-daily basis. Furthermore, marijuana usage has remained at fairly high levels over the last decade, and attitudes about its use have become more positive (Nanda & Konnur, 2006; Tang & Orwin, 2009; Johnston et al., 2015; see Figure 11-9).

Adolescents have a variety of reasons for using drugs. Some use them for the pleasurable experience they supposedly provide. Others use them to try to escape from the pressures of everyday life, however temporarily. Some adolescents try drugs simply for the thrill of doing something illegal.

One of the newest reasons for using drugs is to enhance academic performance. A growing number of high students are using drugs, such as Adderall, an amphetamine prescribed for attention deficit hyperactivity disorder. When used illegally, Adderall is assumed to increase focus and is thought to increase the ability to study and allow users to study for long hours (Schwarz, 2012).

The alleged drug use of well-known celebrities also contributes to drug use. Finally, peer pressure plays a role: Adolescents, as we'll discuss in greater detail in Chapter 12, are particularly susceptible to the perceived standards of their peer groups (Urberg, Luo, & Pilgrim, 2003; Nation & Heflinger, 2006; Young et al., 2006).

addictive drugs
drugs that produce a biological or psychological dependence in users, leading to increasingly powerful cravings for them

The use of illegal drugs is dangerous in several respects. For instance, some drugs are addictive. **Addictive drugs** are drugs that produce a biological or psychological dependence in users, leading to increasingly powerful cravings for them.

When drugs produce a biological addiction, their presence in the body becomes so common that the body is unable to function in their absence. Furthermore, addiction causes actual physical—and potentially lingering—changes in the nervous system. In such cases, drug intake no longer may provide a "high" but may be necessary simply to maintain the perception of everyday normalcy (Cami & Farré, 2003; Munzar, Cami, & Farré, 2003).

In addition to physical addiction, drugs also can produce psychological addiction. In such cases, people grow to depend on drugs to cope with the everyday stress of life. If drugs are used as an escape, they may prevent adolescents from confronting—and potentially solving—the problems that led them to drug use in the first place. Finally, drugs may be dangerous because even casual users of less hazardous drugs can escalate to more dangerous forms of substance abuse (Toch, 1995; Segal & Stewart, 1996).

Alcohol: Use and Abuse

LO 11.10 Discuss how adolescents use and abuse alcohol.

Three-fourths of college students have something in common: They've consumed at least one alcoholic drink during the last 30 days. More than 40 percent say they've had five or more drinks within the past two weeks, and some 16 percent drink 16 or more drinks per week. High school students, too, are drinkers: Nearly three-quarters of high school seniors report having had consumed alcohol by the end of high school, and about

two-fifths have done so by the eighth grade. More than half of twelfth graders and nearly a fifth of eighth graders say that they have been drunk at least once in their lives (Ford, 2007; Johnston et al., 2015).

Binge drinking is a particular problem on college campuses. It is defined for men as drinking five or more drinks in one sitting; for women, who tend to weigh less and whose bodies absorb alcohol less efficiently, binge drinking is defined as four drinks in one sitting. Surveys find that almost half of male college students and over 40 percent of female college students say they participated in binge drinking during the previous two weeks (Harrell & Karim, 2008; Beets et al., 2009; see Figure 11-10).

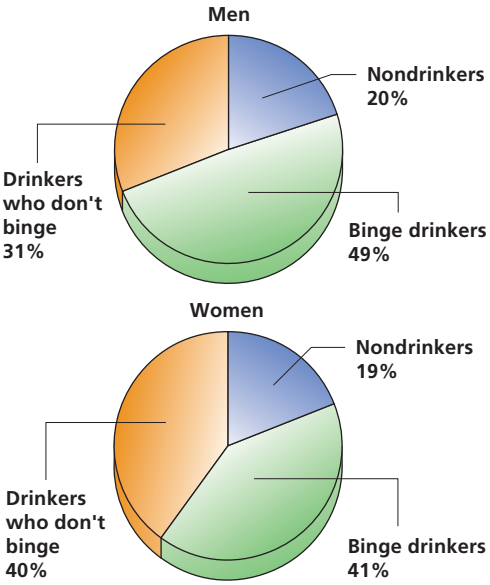
Binge drinking affects even those who don't drink or drink very little. Two-thirds of lighter drinkers reported that they had been disturbed by drunken students while sleeping or studying. Around a third had been insulted or humiliated by a drunken student, and 25 percent of women said they had been the target of an unwanted sexual advance by a drunk classmate. Furthermore, brain scans show damaged tissue in teenage binge drinkers compared to non-binge drinkers (Wechsler et al., 2000, 2002, 2003; McQueeny, 2009; Squeglia et al., 2012; Spear et al., 2013).

Adolescents start to drink for many reasons. For some—especially male athletes, whose rate of drinking tends to be higher than that of the general adolescent population—drinking is seen as a way of proving they can drink as much as anybody. Others drink for the same reason that some use drugs: It releases inhibitions and tension, and it reduces stress. Many begin because the conspicuous examples of drunkenness strewn around campus cause them to assume that everyone is drinking heavily, something known as the *false consensus effect* (Nelson & Wechsler, 2003; Weitzman, Nelson, & Wechsler, 2003; Dunn et al., 2012; Archimi & Kuntsche, 2014).

Figure 11-10 Binge Drinking among College Students

For men, binge drinking is defined as consuming five or more drinks in one sitting; for women, the total is four or more. Why is binge drinking popular?

(**Source:** Wechsler et al., 2003.)



alcoholics
persons with alcohol problems who have learned to depend on alcohol and are unable to control their drinking

For some adolescents, alcohol use becomes a habit that cannot be controlled. **Alcoholics**, those with alcohol problems, learn to depend on alcohol and are unable to control their drinking. They also become increasingly able to tolerate alcohol and therefore need to drink ever-larger amounts of liquor in order to bring about the positive effects they crave. Some drink throughout the day, while others go on binges in which they consume huge quantities of alcohol.

The reasons that some adolescents—or anyone—become alcoholics are not fully known. Genetics plays a role: Alcoholism runs in families. At the same time, not all alcoholics have family members with alcohol problems. For those adolescents with a family history of alcohol problems, alcoholism may be triggered by efforts to deal with the stress that having an alcoholic parent or family member can cause (Berenson, 2005; Clarke et al., 2008).

The origins of an adolescent's problems with alcohol or drugs are less important than getting help. Parents, teachers, and friends can provide the help a teen needs to address the problem—if they realize there is a problem. How can concerned friends and family members tell if an adolescent they know is having difficulties with alcohol or drugs? Some of the telltale signs are described in the nearby *Are You an Informed Consumer of Development?* box.

If an adolescent—or anyone else, for that matter—fits any of these descriptors, help is probably needed. A good place to start is a national hotline run by the National Institute on Drug Abuse at (800) 662-4357 or its website at www.nida.nih.gov. In addition, those who need advice can find a local listing for Alcoholics Anonymous online.

WATCH THIS VIDEO ON MYPSYCHLAB SPEAKING OUT; CHRIS: ALCOHOLISM

Are You an Informed Consumer of Development?

Hooked on Drugs or Alcohol?

It is not always easy to determine whether an adolescent has a drug or alcohol abuse problem, but there are warning signs. Red flags include:

Feeling Connected to or Identifying with the Drug Culture

- Frequent references to drugs in conversation or jokes
- Interest in or familiarity with drug paraphernalia
- Antagonism to discussing drugs
- Drug-related posters or magazines, or clothing with drug references

Marked Changes in School Performance

- Notable drop in grades—not just from C's to F's, but from A's to B's and C's
- Assignments repeatedly turned in late or not completed
- Lack of motivation or self-discipline; appears indifferent or "spaced out"
- Increased absenteeism or tardiness

Physical Deterioration

- Easily distracted, unable to concentrate, memory lapses
- Impaired coordination; tremors, slurred or incoherent speech
- Unhealthy appearance; indifference to hygiene or grooming
- Bloodshot eyes, dilated pupils
- Changes in appetite or sleep patterns; sudden weight loss or gain

Behavioral Changes

- Frequent dishonesty (lying, stealing, cheating); trouble with the police
- Sudden change in friends; reluctant to talk about new ones
- Possession of or unexplained need for large amounts of money
- Sudden mood swings, inappropriate anger, unusual hyperactivity or agitation
- Reduced self-esteem; appears fearful or anxious with no reason
- Diminished interest in extracurricular activities and hobbies (based on Franck & Brownstone, 1991, pp. 593–594)

Tobacco: The Dangers of Smoking

LO 11.11 Summarize how and why adolescents use tobacco.

Most adolescents are well aware of the dangers of smoking, but many still indulge in it. Recent figures show that, overall, a smaller proportion of adolescents smoke than in prior decades, but the numbers remain substantial, and within certain groups the numbers are increasing. Smoking is on the rise among girls, and in several countries, including Austria, Norway, and Sweden, the proportion of girls who smoke is higher than the proportion of boys. There are racial differences as well: White children and children in lower-socioeconomic-status households are more likely to experiment with cigarettes and to start smoking earlier than African American children and children living in higher-socioeconomic-status households. Also, significantly more white males of high school age smoke than do African American males in high school, although the differences have narrowed in recent years (Harrell et al., 1998; Stolberg, 1998; Baker, Brandon, & Chassin, 2004; Fergusson et al., 2007; Proctor, Barnett, & Muilenburg, 2012).

Smoking is becoming a habit that is hard to maintain. There are growing social sanctions against it. It's becoming more difficult to find a comfortable place to smoke: More places, including schools and places of business, have become "smoke-free." Even so, a good number of adolescents still smoke, despite knowing the dangers of smoking and of second-hand smoke. Why, then, do adolescents begin to smoke and maintain the habit?

One reason is that for some adolescents, smoking is seen as an adolescent rite of passage, a sign of growing up. In addition, seeing influential models, such as celebrities, parents, and peers, smoking increases the chances that an adolescent will take up the habit. Cigarettes are also very addictive. Nicotine, the active chemical ingredient of cigarettes,

Developmental Diversity and Your Life

Selling Death: Pushing Smoking to the Less Advantaged

According to a U.S. Cancer Institute report, each major U.S. tobacco company has a leading "youth brand" (Marlboro, Camel, Newport), which it promotes heavily.

New Kool Smooth Fusions cigarettes offer four trendy flavors: Caribbean Chill, Midnight Berry, Mocha Taboo, and Minitrigue, and Skoal chewable tobacco comes in fruity flavors, just like candy.

If you are a cigarette manufacturer and you find that the number of people using your product is declining, what do you do? U.S. companies have sought to carve out new markets by turning to a young and impressionable market, especially among the least advantaged groups of people. In addition to seeking new converts in the United States, tobacco companies aggressively recruit adolescent smokers abroad. In many developing countries, the number of smokers is still low. Tobacco companies are seeking to increase this number through marketing strategies designed to hook adolescents on the habit by means of free samples. In addition, in countries where American culture and products are held in high esteem, advertising suggests that the use of cigarettes is an American—and consequently prestigious—habit (Boseley, 2008; Hakim, 2015).

The strategy is effective. For instance, in some Latin American cities as many as 50 percent of teenagers smoke. According to the World Health Organization, smoking will prematurely kill some 1 billion people in the twenty-first century (Picard, 2008).

can produce biological and psychological dependency very quickly. Although one or two cigarettes generally do not produce a lifetime smoker, it takes only a little more to start the habit. People who smoke as few as 10 cigarettes early in their lives stand an 80 percent chance of becoming habitual smokers (West, Romero, & Trinidad, 2007; Tucker et al., 2008; Wills et al., 2008).

One of the newest trends in smoking is the use of *e-cigarettes*—battery-powered, cigarette-shaped devices that deliver vaporized nicotine. Although they appear to be less harmful than traditional cigarettes, we still don't know their long-term effects, and the U.S. government has sought to regulate their sale (Tavernise, 2014). Despite their potential dangers, they have become increasingly popular. Some 13 percent of high school students used e-cigarettes in 2014, and the number of users appears to be increasing. At the same time, use of traditional tobacco cigarettes declined significantly among high school students, suggesting that e-cigarette use might be a substitute for traditional cigarettes (Gray, 2013; Tavernise, 2013; CDC, 2015). (Also see the *Developmental Diversity and Your Life* feature.)

Sexually Transmitted Infections

LO 11.12 Describe dangers adolescent sexual practices present and how these dangers can be avoided.

When her doctor informed her that she had AIDS, Cheryl Mundt, age 17, thought immediately of her first boyfriend. He had broken up with her a year ago without any explanation and Cheryl could never contact him afterward. Now she was faced with having to tell her new boyfriend about her condition and she wasn't sure what his reaction would be. She only knew that she had to tell him right away, whatever the consequences.

AIDS. Cheryl Mundt was not alone: *Acquired immunodeficiency syndrome*, or *AIDS*, is one of the leading causes of death among young people worldwide. AIDS has no cure and ultimately brings death to those who are infected with the HIV virus that produces the disease.

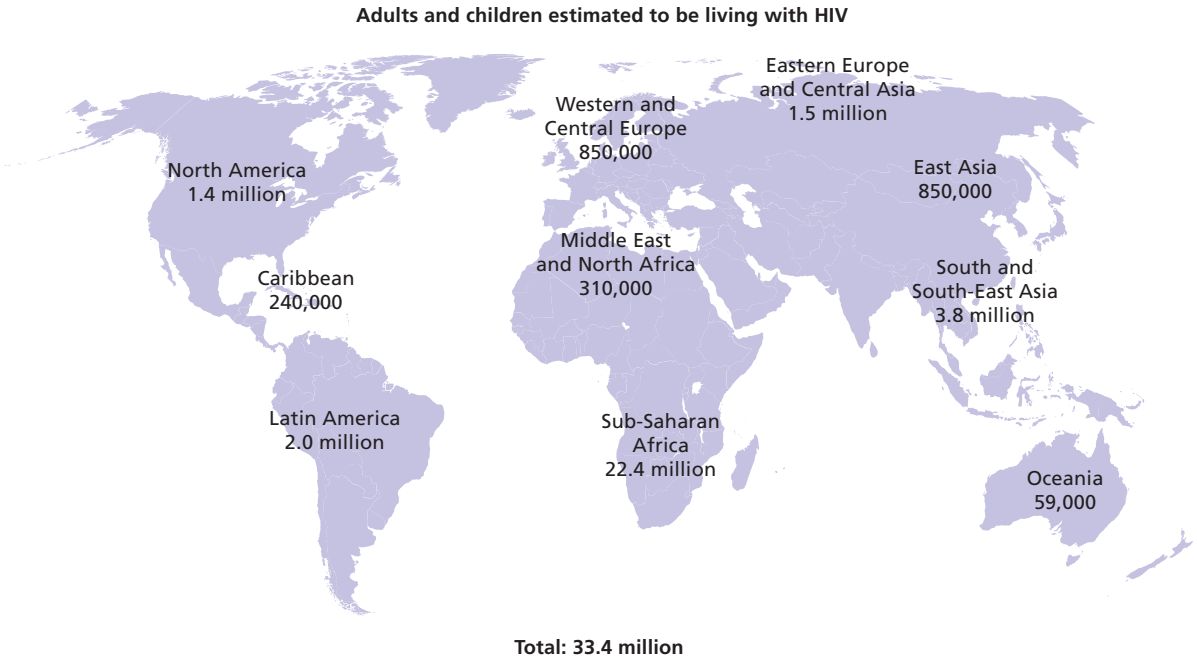
Because AIDS is spread primarily through sexual contact, it is classified as a **sexually transmitted infection (STI)**. Although it began as a problem that primarily affected gays,

sexually transmitted infection (STI)
an infection that is spread through sexual contact

Figure 11-11 AIDS around the World

The number of people carrying the AIDS virus varies substantially by geographic region. By far the most cases are found in Africa and the Middle East, although the disease is a growing problem in Asia.

(**Source:** UNAIDS & World Health Organization, 2009.)



it has spread to other populations, including heterosexuals and intravenous drug users. Minorities have been particularly hard hit: African Americans and Hispanics account for 70 percent of new AIDS cases in the United States, while African American males have almost eight times the prevalence of AIDS as white males. Already, over 25 million people have died from AIDS worldwide, and people living with the disease number 34 million worldwide (see Figure 11-11; UNAIDS, 2011).

OTHER SEXUALLY TRANSMITTED INFECTIONS. AIDS is the deadliest of sexually transmitted infections, but a number of other sexually transmitted infections (STIs) are far more common (see Figure 11-12). One out of four adolescents contracts an STI before graduating from high school. Overall, around 2.5 million teenagers contract an STI, such as the ones listed in Figure 11-12, each year (Weinstock, Berman, & Cates, 2004).

The most common STI is *human papilloma virus (HPV)*. HPV can be transmitted through genital contact without intercourse. Most infections do not have symptoms, but HPV can produce genital warts and in some cases lead to cervical cancer. A vaccine that protects against some kinds of HPV is available. The U.S. Centers for Disease Control and Prevention recommends it be routinely administered to girls 11 to 12 years of age—a recommendation that has provoked considerable political reaction (Caskey, Lindau, & Caleb, 2009; Schwarz et al., 2012; Thomas et al., 2013).

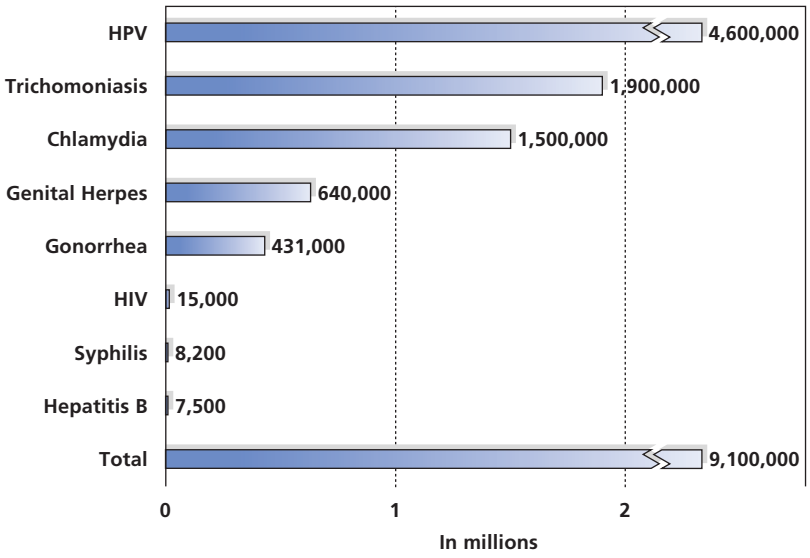
Another common STI is *trichomoniasis*, an infection in the vagina or penis that is caused by a parasite. Initially without symptoms, it can eventually cause a painful discharge. *Chlamydia*, a bacterial infection, initially has few symptoms, but later it causes burning urination and a discharge from the penis or vagina. It can lead to pelvic inflammation and even to sterility. Chlamydial infections can be treated successfully with antibiotics (Nockels & Oakeshott, 1999; Fayers et al., 2003).

Genital herpes is a virus not unlike the cold sores that sometimes appear around the mouth. The first symptoms of herpes are often small blisters or sores around the genitals, which may break open and become quite painful. Although the sores may heal after a few weeks, the infection often recurs after an interval, and the cycle repeats itself. When the sores reappear, the infection, for which there is no cure, is contagious.

Figure 11-12 Sexually Transmitted Infections (STIs) among Adolescents

Why are adolescents in particular in danger of contracting an STI?

(**Sources:** Alan Guttmacher Institute, 2004; Weinstock, Berman, & Cates, 2006.)



Gonorrhea and *syphilis* are the STIs that have been recognized for the longest time; cases were recorded by ancient historians. Until the advent of antibiotics, both infections were deadly. However, today both can be treated quite effectively.

From a *health-care provider's* perspective

Why do adolescents' increased cognitive abilities, including the ability to reason and to think experimentally, fail to deter them from irrational behavior, such as drug and alcohol abuse, tobacco use, and unsafe sex practices? How might you use these abilities to design a program to help prevent such problems?

AVOIDING STIs. Short of abstinence, there is no certain way to avoid STIs. However, there are things that can be done to make sex safer; these are listed in Table 11-1.

Still, even when adolescents have been exposed to substantial sex education, the use of safer sex practices is far from universal. As we discussed earlier in the chapter, teens are prone to feel invulnerable and are therefore more likely to engage in risky behavior, believing their chances of contracting STIs are minimal. This is particularly true when adolescents perceive that their partner is "safe"—someone they know well and with whom they are involved in a relatively long-term relationship (Tinsley, Lees, & Sumartojo, 2004; Widman et al., 2014).

Table 11-1 Safer Sex Practices

The only foolproof method of avoiding a sexually transmitted infection (STI) is abstinence. However, by following the "safer sex" practices listed here, one can significantly reduce the risk of contracting an STI:

- *Know your sexual partner well.* Before having sex with someone, learn about his or her sexual history.
- *Use condoms.* For those in sexual relationships, condoms are the most reliable means of preventing transmission of STIs.
- *Avoid the exchange of bodily fluids, particularly semen.* In particular, avoid anal intercourse. The AIDS virus in particular can spread through small tears in the rectum, making anal intercourse without condoms particularly dangerous. Oral sex, once thought relatively safe, is now viewed as potentially dangerous for contracting the AIDS virus.
- *Stay sober.* Using alcohol and drugs impairs judgment and can lead to poor decisions—and it makes using a condom correctly more difficult.
- *Consider the benefits of monogamy.* People in long-term, monogamous relationships with partners who have been faithful are at a lower risk of contracting STIs.

Unfortunately, unless an individual knows the complete sexual history and STI status of a partner, unprotected sex remains a risky business. And learning a partner's complete sexual history is difficult. Not only is it embarrassing to ask, but partners may not be accurate reporters, whether from ignorance of their own exposure, embarrassment, a sense of privacy, or simply forgetfulness. As a result, STIs remain a significant problem among adolescents.

Module 11.3 Review

- Illegal drug use is prevalent among adolescents as a way to find pleasure, avoid pressure, or gain the approval of peers.
- The use of alcohol is also popular among adolescents, often to appear adult or to lessen inhibitions.
- Despite the well-known dangers of smoking, adolescents often smoke to enhance their images or to emulate adults.
- AIDS is the most serious of the sexually transmitted infections, ultimately causing death. Safe-sex practices or sexual abstinence can prevent AIDS, although adolescents often ignore these strategies. Other sexually transmitted infections affect adolescents, such as chlamydia, genital herpes, trichomoniasis, gonorrhea, and syphilis.

Journal Writing Prompt

Applying Lifespan Development: How do adolescents' concerns about self-image and their perception that they are the center of attention contribute to smoking and alcohol use?

Epilogue

To call adolescence a period of great change in people's lives is an understatement. This chapter looked at the significant physical, psychological, and cognitive changes that adolescents undergo and at some of the consequences of entering and living through adolescence.

Before turning to the next chapter, return for the moment to the opening prologue of this chapter, about Gavin, the boy who wants to travel on his own to Haiti. In light of what you now know about adolescence, consider the following questions:

1. How are Gavin's dreams of Haiti typical of the egocentrism of adolescence?
2. What worries might Gavin's dad have about allowing his 15-year-old son to go to Haiti on his own? From what you have learned about adolescent development, which of these concerns might be justified?
3. How do Gavin's arguments exemplify the cognitive changes and abilities of adolescence?
4. Do you think Gavin is right about kids growing up a lot faster these days? Explain your answer in terms of both physical and cognitive development.

Looking Back

LO 11.1 Describe the physical changes adolescents experience as the body reaches puberty.

The adolescent years are marked by a physical growth spurt, which for girls begins around age 10, and for boys, around age 12. Puberty begins in girls at around age 11 and in boys at around age 13. The physical changes of puberty often have psychological effects, such as an increase in self-esteem and self-awareness, as well as confusion and uncertainty about sexuality. Early maturation has different effects on boys and girls. For boys, being bigger and more developed can lead to increased athleticism, greater popularity, and a more positive self-concept. For girls, early maturation can lead to increased popularity and an enhanced social life but also embarrassment over their bodies, which suddenly look different from everyone else's. For the short term, late maturation can be a physical and social disadvantage that affects boys' self-concept. Girls who mature late may suffer neglect by their peers, but ultimately they appear to suffer no lasting ill effects and may even benefit.

LO 11.2 Explain the nutritional needs and concerns of adolescents.

While most adolescents have no greater nutritional worries other than fueling their growth with appropriate foods, some are obese or overweight. Excessive concern about obesity can cause some adolescents, especially girls, to develop an eating disorder, such as anorexia nervosa or bulimia.

LO 11.3 Summarize the ways in which the brain develops in adolescence.

Changes in the brain pave the way for the rapid cognitive growth of adolescence, especially changes in the prefrontal cortex. These changes permit sophisticated thought, evaluation, and judgment, enabling the complex intellectual achievements of adolescence.

LO 11.4 Describe how cognitive development proceeds during adolescence according to Piaget.

Adolescence coincides with Piaget's formal operations period of development, when people begin to engage in abstract thought and scientific reasoning.

LO 11.5 Summarize how information processing approaches explain adolescent cognitive development.

According to information processing approaches, cognitive growth during adolescence is gradual and quantitative, involving improvements in memory capacity, mental strategies, metacognition, and other aspects of cognitive functioning. Adolescents also grow in the area of metacognition, which permits them to monitor their thought processes and accurately assess their cognitive capabilities.

LO 11.6 Describe how adolescent egocentrism affects thinking and behavior.

Adolescents' developing cognitive abilities may also promote a form of adolescent egocentrism, a self-absorption related to their developing sense of themselves as independent identities. This can make it hard for adolescents to accept criticism and tolerate authority figures. Adolescents may play to an imaginary audience of critical observers, and they may develop personal fables.

LO 11.7 Analyze the factors that affect adolescent school performance.

School performance tends to decline during the adolescent years. School achievement is linked with socioeconomic status, race, and ethnicity. While many academic achievement differences are due to socioeconomic factors, attributional patterns regarding success factors and belief systems regarding the link between school success and success in life also play a part.

LO 11.8 Describe how adolescents use the Internet.

Adolescents are avid Internet users, spending significant portions of each day using social media, information resources, and entertainment outlets. The Internet also supports abuse, such as cyberbullying.

LO 11.9 Analyze what illegal drugs adolescents use and why.

The use of illicit drugs is widespread among adolescents, who are motivated by pleasure seeking, pressure avoidance, the desire to flout authority, or the imitation of role models.

LO 11.10 Discuss how adolescents use and abuse alcohol.

Many adolescents use alcohol for social reasons and to experience a readily available high. Binge drinking is a particular hazard among college students.

LO 11.11 Summarize how and why adolescents use tobacco.

Despite social sanctions against it, many adolescents continue to use tobacco—or lately, e-cigarettes—as a rite of passage into adulthood.

LO 11.12 Describe dangers adolescent sexual practices present and how these dangers can be avoided.

AIDS is one of the leading causes of death among young people, affecting minority populations with particular severity. Adolescent behavior patterns and attitudes, such as shyness, self-absorption, and a belief in personal invulnerability, work against the use of safe-sex practices that can prevent the disease. Other sexually transmitted infections, including chlamydia, genital herpes, trichomoniasis, gonorrhea, and syphilis, occur frequently among the adolescent population and can also be prevented by safe-sex practices or abstinence.

Key Terms and Concepts

adolescence 378
puberty 378
menarche 379
secular trend 380
primary sex characteristics 380
secondary sex characteristics 380
anorexia nervosa 384
bulimia 384
formal operational stage 388
information processing perspective 391
metacognition 391
adolescent egocentrism 392
imaginary audience 392
personal fables 392
addictive drugs 400
alcoholics 401
sexually transmitted infection (STI) 403

Chapter 12

Social and Personality Development in Adolescence

Learning Objectives

LO 12.1 Describe how self-concept and self-esteem develop during adolescence.

LO 12.2 Summarize how Erikson explains identity formation during adolescence.

LO 12.3 Explain Marcia's categories of adolescent identity.

LO 12.4 Describe the role religion and spirituality play in identity formation in adolescence.

LO 12.5 Discuss the challenges ethnic and minority groups face in identity formation in adolescence.

LO 12.6 Identify the dangers adolescents face as they deal with the stresses of their age.

LO 12.7 Describe what family relationships are like during adolescence.

LO 12.8 Explain how relationships with peers change during adolescence.

LO 12.9 Discuss what it means to be popular and unpopular in adolescence and how adolescents respond to peer pressure.

LO 12.10 Describe the functions and characteristics of dating during adolescence and how sexuality develops.

LO 12.11 Explain how sexual orientation develops in adolescence.

LO 12.12 Summarize the challenges of teen pregnancy and the types of programs that are most effective in preventing it.

Chapter Overview

Prologue: Keeping Up Appearances

Livia Abello, 16, spends all the cash from her part-time job on makeup, hair products, and clothes. "It's hard to keep up with the other girls," she says. "There are a lot of rich kids at my school, but I'm not one of them." Still, Livia always manages to surround herself with a circle of friends. Freshman year, it was the girls from the soccer team. Last year, Livia painted scenery and hung out with the kids in the theater crowd. This year, she's a member of the JV girls' dance squad. She admits that there isn't much carryover in these friendships from year to year. "People change." She shrugs. "*I* change." The important thing, she insists, is to be part of a clique. "No one wants to be seen as a loser." Through it all, Livia's grades have remained good—mostly *B*s sprinkled with *A*s. She says she could do better but "it doesn't pay to be labeled a nerd."

Lately, however, she's begun to struggle to get the *B*s. "I get tired just thinking about school," she says. Then, there's her current boyfriend, a "hottie" everyone in her clique worships. But Livia is troubled by his drinking. Talking about her life now, she confesses, "I used to see myself as someone who could manage everything. I was pretty and popular and just smart enough. Now, I'm wondering if that hasn't just been a disguise. You know, a cloak you put on to hide the fact that there's really not much underneath." ■

Looking Ahead

The issues of identity and self-esteem Livia is grappling with are ones that virtually every adolescent experiences. As painful and confusing as these questions are, most teenagers pass through the period without major turmoil. Although they may "try on" different roles and flirt with activities that their parents find objectionable, the majority of adolescents find adolescence an exciting time during which friendships grow, intimate relationships develop, and their sense of themselves deepens.

This is not to say that the transitions adolescents pass through are unchallenging. As we shall see in this chapter, in which we discuss personality and social development, adolescence brings about major changes in how individuals must deal with the world.

We begin by considering how adolescents form their views of themselves. We look at self-concept, self-esteem, and identity development. We also examine two major psychological difficulties: depression and suicide.

The social lives of adolescents take varied forms.

Next, we discuss relationships during adolescence. We consider how adolescents reposition themselves within the family and how the influence of family members declines in some spheres as peers take on new importance. We also examine the ways in which adolescents interact with their friends and the ways in which popularity is determined.

Finally, the chapter considers dating and sexual behavior. We look at the role of dating and close relationships in adolescents' lives, and we consider sexual behavior and the standards that govern adolescents' sex lives. We conclude by looking at teenage pregnancy and at programs that seek to prevent unwanted pregnancy.

Identity: Asking "Who Am I?"

> *"You have no idea how much pressure a 13-year-old has to deal with. You've got to look cool, act cool, wear the right clothes, wear your hair a certain way—and your friends have different ideas about all these things than your parents, know what I mean? And you've got to have friends or you're nobody. And then some of your friends say you're not cool if you don't drink or do drugs, but what if you don't want that?"—Anton Merced*

The thoughts of 13-year-old Anton Merced demonstrate a clear awareness—and self-consciousness—regarding his newly forming place in society and life. During adolescence, questions like "Who am I?" and "Where do I belong in the world?" begin to take a front seat.

Why should issues of identity become so important during adolescence? One reason is that adolescents' intellectual capacities become more adult-like. They are able to see how they stack up against others and become aware that they are individuals, apart not just from their parents but from all others. The dramatic physical changes during puberty make adolescents acutely aware of their own bodies and aware that others are reacting to them in ways to which they are unaccustomed. Whatever the cause, adolescence often brings substantial changes in teenagers' self-concepts and self-esteem—in sum, their notions of their own identity.

Self-Concept and Self-Esteem

LO 12.1 Describe how self-concept and self-esteem develop during adolescence.

Who are you, and how do you feel about yourself? Questions like these present important challenges during adolescence.

SELF-CONCEPT: ASKING, "WHAT AM I LIKE?" Ask Valerie to describe herself, and she says, "Others look at me as laid-back, relaxed, and not worrying too much. But really, I'm often nervous and emotional."

The fact that Valerie distinguishes others' views of her from her own perceptions represents a developmental advance of adolescence. In childhood, Valerie would have characterized herself according to a list of traits that would not differentiate her view of herself and others' perspectives. However, adolescents are able to make the distinction, and when they try to describe who they are, they take both their own and others' views into account (Updegraff et al., 2004; Chen, S. et al., 2012; Preckel et al., 2013; McLean & Syed, 2015).

This broader view of themselves is one aspect of adolescents' increasing understanding of who they are. They can see various aspects of the self simultaneously, and this view of the self becomes more organized and coherent. They look at the self from

a psychological perspective, viewing traits not as concrete entities but as abstractions (Adams, Montemayor, & Gullotta, 1996). For example, teenagers are more likely than younger children to describe themselves in terms of their ideology (saying something like "I'm an environmentalist") than in terms of physical characteristics (such as "I'm the fastest runner in my class").

In some ways, this broader, more multifaceted self-concept is a mixed blessing, especially during the earlier years of adolescence. At that time, adolescents may be troubled by the multiple aspects of their personalities. During the beginning of adolescence, for instance, teenagers may want to view themselves in a certain way ("I'm a sociable person and love to be with people"), and they may become concerned when their behavior is inconsistent with that view ("Even though I want to be sociable, sometimes I can't stand being around my friends and just want to be alone"). By the end of adolescence, however, teenagers find it easier to accept that different situations elicit different behaviors and feelings (Trzesniewski, Donnellan, & Robins, 2003; Hitlin, Brown, & Elder, 2006).

Adolescents' sense of who they are takes their own and others' views into account.

SELF-ESTEEM: ASKING HOW DO I LIKE MYSELF? *Knowing* who you are and *liking* who you are two different things. Although adolescents become increasingly accurate in understanding who they are (their self–concept), this knowledge does not guarantee that they like themselves (their self-esteem) any better. In fact, their increasing accuracy in understanding themselves permits them to see themselves fully—warts and all. It's what they do with these perceptions that leads them to develop a sense of their self-esteem.

The same cognitive sophistication that allows adolescents to differentiate various aspects of the self also leads them to evaluate those aspects in different ways (Chan, 1997; J. Cohen, 1999). For instance, an adolescent may have high self-esteem in terms of academic performance but lower self-esteem in terms of relationships with others. Or it may be just the opposite, as articulated by this adolescent:

> Do I *like* myself? What a question! Well, let's see. I like some of what I am, like I'm a good listener and a good friend, but I don't like other things, like my jealous side. I'm no genius at schoolwork—my parents would like me to do better—but if you're too smart you don't have a lot of friends. I'm pretty good at sports, especially swimming. But the best thing about me is that I'm a good friend, you know, loyal. I'm pretty well known for that, and pretty popular.

GENDER DIFFERENCES IN SELF-ESTEEM. What determines an adolescent's self-esteem? Several factors make a difference. One is gender: Particularly during early adolescence, girls' self-esteem tends to be lower and more vulnerable than boys' self–esteem. One reason for this difference is that, compared to boys, girls tend to be more concerned about physical appearance and social success—in addition to academic achievement. Although boys are also concerned about these things, their attitudes are often more casual. In addition, societal messages suggesting that female academic achievement is a roadblock to social success can put girls in a difficult bind: If they do well academically, they jeopardize their social success. No wonder that the self-esteem of adolescent girls is more fragile than that of boys (McLean & Breen, 2009; Mäkinen et al., 2012; Ayres & Leaper, 2013; Jenkins & Demaray, 2015).

Although generally self-esteem is higher in adolescent boys than girls, boys do have vulnerabilities of their own. For example, society's stereotypical gender expectations may lead boys to feel that they should be confident, tough, and fearless all the time. Boys facing difficulties, such as not making a sports team or rejection from a girl they wanted to date, are likely to feel not only miserable about the defeat they face but also incompetent because they don't measure up to the stereotype (Pollack, 1999; Pollack, Shuster, & Trelease, 2001).

SOCIOECONOMIC STATUS AND RACE DIFFERENCES IN SELF-ESTEEM. Socioeconomic status (SES) and race also influence self-esteem. Adolescents of higher SES generally have higher self-esteem than those of lower SES, particularly during middle and later adolescence. It may be that the social status factors that especially enhance one's standing and self-esteem—such as having more expensive clothes or a car—become more conspicuous in the later periods of adolescence (Dai et al., 2012; Cuperman, Robinson, & Ickes, 2014).

Race and ethnicity also play a role in self-esteem, but their impact has lessened as prejudicial treatment of minorities has eased. Early studies argued that minority status would lead to lower self-esteem, and this was initially supported by research. African Americans and Hispanics, researchers explained, had lower self-esteem than Caucasians because prejudicial attitudes in society made them feel disliked and rejected, and this feeling was incorporated into their self-concepts. More recent research paints a different picture. Most findings suggest that African American adolescents differ little from whites in their levels of self-esteem (Harter, 1990b). Why should this be? One explanation is that social movements within the African American community that bolster racial pride help support African American adolescents. Research finds that a stronger sense of racial identity is related to a higher level of self-esteem in African Americans and Hispanics (Verkuyten, 2003; Phinney, 2008; Kogan et al., 2014).

A strong sense of racial identity during adolescence is tied to higher levels of self-esteem.

Another reason for overall similarity in self-esteem levels between adolescents of different racial groups is that teenagers in general focus their preferences and priorities on those aspects of their lives at which they excel. Consequently, African American youths may concentrate on the things that they find most satisfying and gain self-esteem from being successful at them (Gray-Little & Hafdahl, 2000; Yang & Blodgett, 2000; Phinney, 2005).

Finally, self-esteem may be influenced not by race alone but by a complex combination of factors. For instance, some developmentalists have considered race and gender simultaneously, coining the term *ethgender* to refer to the joint influence of race and gender. One study that simultaneously took both race and gender into account found that African American and Hispanic males had the highest levels of self-esteem, while Asian and Native American females had the lowest levels (Saunders, Davis, & Williams, 2004; Biro et al., 2006; Park et al., 2012).

Identity Formation: Change or Crisis?

LO 12.2 Summarize how Erikson explains identity formation during adolescence.

According to Erik Erikson, whose theory we last discussed in Chapter 10, the search for identity inevitably leads some adolescents into substantial psychological turmoil as they encounter the adolescent identity crisis (Erikson, 1963). Erikson's theory regarding this stage, which is summarized with his other stages in Table 12-1, suggests that teenagers try to figure out what is unique and distinctive about themselves—something they are able to do with increasing sophistication because of the cognitive gains that occur during adolescence.

Erikson argues that adolescents strive to discover their particular strengths and weaknesses and the roles they can best play in their future lives. This discovery process often involves "trying on" different roles or choices to see if they fit an adolescent's capabilities and views about himself or herself. Through this process, adolescents seek to understand who they are by narrowing and making choices about their personal, occupational, sexual, and political commitments. Erikson calls this the **identity-versus-identity-confusion stage**.

identity-versus-identity-confusion stage
the period during which teenagers seek to determine what is unique and distinctive about themselves

In Erikson's view, adolescents who stumble in their efforts to find a suitable identity may go off course in several ways. They may adopt socially unacceptable roles as

Table 12-1 A Summary of Erikson's Stages

Stage	Approximate Age	Positive Outcomes	Negative Outcomes
1. Trust versus mistrust	Birth–1.5 years	Feelings of trust from others' support	Fear and concern regarding others
2. Autonomy versus shame and doubt	1.5–3 years	Self-sufficiency if exploration is encouraged	Doubts about self; lack of independence
3. Initiative versus guilt	3–6 years	Discovery of ways to initiate actions	Guilt from actions and thoughts
4. Industry versus inferiority	6–12 years	Development of sense of competence	Feelings of inferiority; little sense of mastery
5. Identity versus identity confusion	Adolescence	Awareness of uniqueness of self; knowledge of roles	Inability to identify appropriate roles in life
6. Intimacy versus isolation	Early adulthood	Development of loving, sexual relationships and close friendships	Fear of relationships with others
7. Generativity versus stagnation	Middle adulthood	Sense of contribution to continuity of life	Trivialization of one's activities
8. Ego-integrity versus despair	Late adulthood	Sense of unity in life's accomplishments	Regret over lost opportunities of life

(Source: Erikson, 1963.)

a way of expressing what they do *not* want to be, or they may have difficulty forming and maintaining long-lasting close personal relationships. In general, their sense of self becomes "diffuse," failing to organize around a central, unified core identity.

On the other hand, those who are successful in forging an appropriate identity set a course that provides a foundation for future psychosocial development. They learn their unique capabilities and believe in them, and they develop an accurate sense of who they are. They are prepared to set out on a path that takes full advantage of what their unique strengths permit them to do (Allison & Schultz, 2001).

During the identity-versus-identity-confusion stage, U.S. teenagers seek to understand who they are by narrowing and making choices about their personal, occupational, sexual, and political commitments. Can this stage be applied to teenagers in other cultures? Why or why not?

SOCIETAL PRESSURES AND RELIANCE ON FRIENDS AND PEERS. As if teenagers' self-generated identity issues were not difficult enough, societal pressures are also high during the identity-versus-identity-confusion stage, as any student knows who has been repeatedly asked by parents and friends "What's your major?" and "What are you going to do when you graduate?" Adolescents feel pressure to decide whether their post-high school plans include work or college and, if they choose work, which occupational track to follow. Up to this point in their development, their educational lives have been pretty much programmed by U.S. society, which lays out a universal educational track. However, the track ends at high school, and consequently, adolescents face difficult choices about which of several possible future paths they will follow.

During this period, adolescents increasingly rely on their friends and peers as sources of information. At the same time, their dependence on adults declines. As we discuss later in the chapter, this increasing dependence on the peer group enables adolescents to forge close relationships. Comparing themselves to others helps them clarify their own identities.

This reliance on peers to help adolescents define their identities and learn to form relationships is the link between this stage of psychosocial development and the next stage Erikson proposed, known as *intimacy versus isolation*. It also relates to the subject of gender differences in identity formation. When Erikson developed his theory, he suggested that males and females move through the identity-versus-identity-confusion period differently. He argued that males are more likely to proceed through the social development stages in the order they are shown in Table 12-1, developing a stable identity before committing to an intimate relationship with another person. In contrast, he suggested that females reverse the order, seeking intimate relationships and then defining their identities through these relationships. These ideas largely reflect the social

conditions at the time Erikson was writing, when women were less likely to go to college or establish their own careers and instead often married early. Today, however, the experiences of boys and girls seem relatively similar during the identity-versus-identity-confusion period.

PSYCHOLOGICAL MORATORIUM. Because of the pressures of the identity-versus-identity-confusion period, Erikson suggested that many adolescents pursue a "psychological moratorium." The *psychological moratorium* is a period during which adolescents take time off from the upcoming responsibilities of adulthood and explore various roles and possibilities. For example, many college students take a semester or year off to travel, work, or find some other way to examine their priorities.

On the other hand, many adolescents cannot, for practical reasons, pursue a psychological moratorium involving a relatively leisurely exploration of various identities. Some adolescents, for economic reasons, must work part time after school and then take jobs immediately after graduation from high school. As a result, they have little time to experiment with identities and engage in a psychological moratorium. Does this mean such adolescents will be psychologically damaged in some way? Probably not. The satisfaction that can come from successfully holding a part-time job while attending school may be a sufficient psychological reward to outweigh the inability to try out various roles.

LIMITATIONS OF ERIKSON'S THEORY. One criticism that has been raised regarding Erikson's theory is that he uses male identity development as the standard against which to compare female identity. To critics, Erikson's view is based on male-oriented concepts of individuality and competitiveness. In an alternative conception, psychologist Carol Gilligan has suggested that women develop identity through the establishment of relationships. In this view, a key component of a woman's identity is the building of caring networks between herself and others (Gilligan, 2004; Kroger, 2006).

Marcia's Approach to Identity Development: Updating Erikson

LO 12.3 Explain Marcia's categories of adolescent identity.

Using Erikson's theory as a springboard, psychologist James Marcia suggests that identity can be seen in terms of which of two characteristics—crisis or commitment—is present or absent. *Crisis* is a period of identity development in which an adolescent consciously chooses between various alternatives and makes decisions. *Commitment* is psychological investment in a course of action or an ideology. We can see the difference between an adolescent who careens from one activity to another, with nothing lasting more than a few weeks, compared with one who becomes totally absorbed in volunteer work at a homeless shelter, for example (Marcia, 1980; Peterson, Marcia, & Carpendale, 2004).

After conducting lengthy interviews with adolescents, Marcia proposed four categories of adolescent identity (see Table 12-2).

identity achievement
the status of adolescents who commit to a particular identity following a period of crisis during which they consider various alternatives

identity foreclosure
the status of adolescents who prematurely commit to an identity without adequately exploring alternatives

1. **Identity achievement.** Teenagers within this identity status have successfully explored and thought through who they are and what they want to do. Following a period of crisis during which they considered various alternatives, these adolescents have committed to a particular identity. Teens who have reached this identity status tend to be the most psychologically healthy, higher in achievement motivation and moral reasoning than adolescents of any other status.

2. **Identity foreclosure.** These are adolescents who have committed to an identity but who did not do it by passing through a period of crisis in which they explored alternatives. Instead, they accepted others' decisions about what was best for them. Typical adolescents in this category are a son who enters the family business because it is expected of him and a daughter who decides to become a physician simply

Table 12-2 Marcia's Four Categories of Adolescent Development

		COMMITMENT: Present	COMMITMENT: Absent
CRISIS/EXPLORATION	PRESENT	**Identity achievement** "I enjoyed working at an advertising company the last two summers, so I plan to go into advertising."	**Moratorium** "I'm taking a job at my mom's bookstore until I figure out what I really want to do."
	ABSENT	**Identity foreclosure** "My dad says I'm good with kids and would be a good teacher, so I guess that's what I'll do."	**Identity diffusion** "Frankly, I have no idea what I'm going to do."

(**Source:** Based on Marcia, 1980.)

because her mother is one. Although foreclosers are not necessarily unhappy, they tend to have what can be called "rigid strength": Happy and self-satisfied, they also have a high need for social approval and tend to be authoritarian.

3. **Moratorium**. Although adolescents in the moratorium category have explored various alternatives to some degree, they have not yet committed themselves. As a consequence, Marcia suggests, they show relatively high anxiety and experience psychological conflict. On the other hand, they are often lively and appealing, seeking intimacy with others. Adolescents of this status typically settle on an identity but only after something of a struggle.

moratorium
the status of adolescents who may have explored various identity alternatives to some degree, but have not yet committed themselves

4. **Identity diffusion**. Adolescents in this category neither explore nor commit to considering various alternatives. They tend to be flighty, shifting from one thing to the next. While they may seem carefree, according to Marcia, their lack of commitment impairs their ability to form close relationships. In fact, they are often socially withdrawn.

identity diffusion
the status of adolescents who consider various identity alternatives, but never commit to one or never even consider identity options in any conscious way

It is important to note that adolescents are not necessarily stuck in one of the four categories. Some move back and forth between moratorium and identity achievement in what has been called a "MAMA" cycle (moratorium—identity achievement—moratorium—identity achievement). For instance, even though a forecloser may have settled on a career path during early adolescence with little active decision making, he or she may reassess the choice later and move into another category. For some individuals, then, identity formation may take place beyond the period of adolescence. However, identity gels in the late teens and early 20s for most people (Al-Owidha, Green, & Kroger, 2009; Duriez et al., 2012; Mrazek, Harada, & Chiao, 2014).

From *a social worker's* perspective

Do you believe that all four of Marcia's identity statuses can lead to reassessment and different choices later in life? Are there stages in Marcia's theory of development that may be more difficult to achieve for adolescents who live in poverty? Why?

Religion and Spirituality

LO 12.4 Describe the role religion and spirituality play in identity formation in adolescence.

Ever wonder why God made mosquitos? How about why God gave Adam and Eve the ability to rebel if He knew how much of mess it would cause? Can someone be saved and later lose their salvation? Do pets go to Heaven?

As exemplified in this blog post, questions of religion and spirituality begin to be asked during adolescence. Religion is important to many people because it offers a formal

means of satisfying spirituality needs. *Spirituality* is a sense of attachment to some higher power, such as God, nature, or something sacred. Although spirituality needs are typically tied to religious beliefs, they may be independent. Many people who consider themselves to be spiritual individuals do not participate in formal religious practices or are not affiliated with any particular religion.

Because their cognitive abilities increase during adolescence, teenagers are able to think more abstractly about religious matters. Furthermore, as they grapple with general questions of identity, they may question their religious identity. After having accepted their religious identity in an unquestioning manner during childhood, adolescents may view religion more critically and seek to distance themselves from formal religion. In other cases, they may be drawn more closely to their religious affiliation because it offers answers to such abstract questions as "Why am I here on this earth?" and "What is the meaning of life?" Religion provides a way of viewing the world and universe as having intentional design—a place that was created by something or someone (Azar, 2010; Yonker, Schnabelrauch, & DeHaan, 2012; Levenson, Aldwin, & Igarashi, 2013).

According to James Fowler, our understanding and practice of faith and spirituality proceeds through a series of stages that extend throughout the lifetime. During childhood, individuals hold a fairly literal view of God and biblical figures. For example, children may think of God as living at the top of the earth and being able to see what everyone is doing (Fowler & Dell, 2006).

In adolescence, the view of spirituality becomes more abstract. As they build their identity, adolescents typically develop a core set of beliefs and values. On the other hand, in many cases, adolescents do not consider their views either deeply or systematically, and it is not until later that they become more reflective.

As they leave adolescence, people typically move into the *individuative-reflective stage* of faith in which they reflect on their beliefs and values. They understand that their views are one of many, and that multiple views of God are possible. Ultimately, the final stage of faith development is the *conjunctive stage*, in which individuals develop a broad, inclusive view of religion and all humanity. They see humanity as a whole, and they may work to promote a common good. In this stage, they may move beyond formal religion and hold a unified view of people across the globe.

Identity, Race, and Ethnicity

LO 12.5 Discuss the challenges ethnic and minority groups face in identity formation in adolescence.

Although the path to forming an identity is often difficult for adolescents, it presents a particular challenge for members of racial and ethnic groups that have traditionally been discriminated against. Society's contradictory values are one part of the problem. On the one hand, adolescents are told that society should be color blind, that race and ethnic background should not matter in terms of opportunities and achievement, and that if they do achieve, society will accept them. Based on a traditional *cultural assimilation model*, this view holds that individual cultural identities should be assimilated into a unified culture in the United States—the proverbial melting-pot model.

The *pluralistic society model* suggests that U.S. society is made up of diverse, coequal cultural groups that should preserve their individual cultural features. The pluralistic society model grew in part from the belief that the cultural assimilation model denigrates the cultural heritage of minorities and lowers their self-esteem.

According to this view, then, racial and ethnic factors become a central part of adolescents' identity and are not submerged in an attempt to assimilate into the majority culture. From this perspective, identity development includes development of *racial and ethnic identity*—the sense of membership in a racial or ethnic group and the feelings that are associated with that membership. It includes a sense of commitment and ties with

a particular racial or ethnic group (Phinney, 2008; Gfellner & Armstrong, 2013; Umaña-Taylor et al., 2014).

There is a middle ground. Minority group members can form a *bicultural identity* in which they draw from their own cultural identity while integrating themselves into the dominant culture. This view suggests that an individual can live as a member of two cultures, with two cultural identities, without having to choose one over the other (LaFromboise, Coleman, & Gerton, 1993; Shi & Lu, 2007).

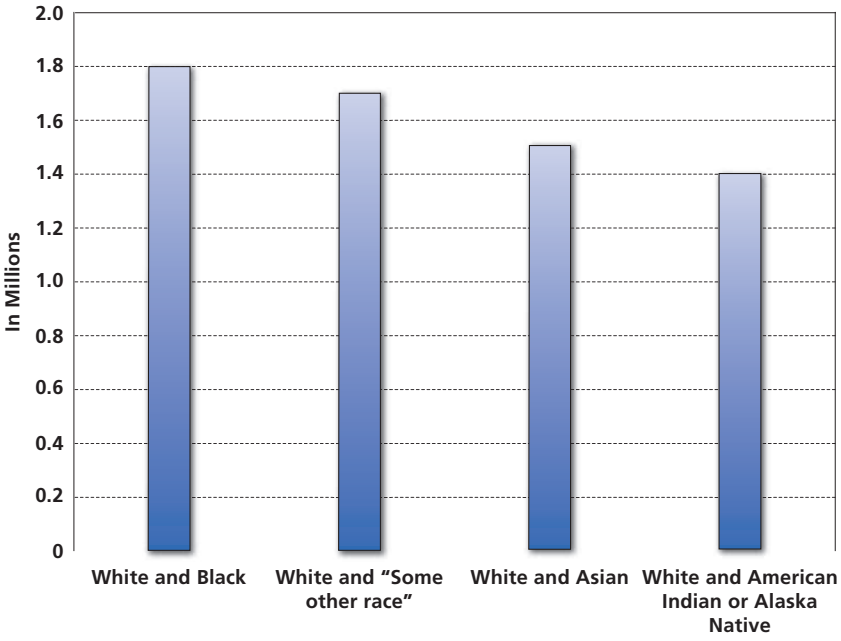
The choice of a bicultural identity is increasingly common. In fact, the number of people who identify themselves as belonging to more than one race is considerable, increasing 134 percent from 2000 to 2010 (see Figure 12-1; U.S. Census Bureau, 2011).

The process of identity formation is not simple for anyone and may be doubly difficult for minority group members. Racial and ethnic identity takes time to form, and for some individuals it may occur over a prolonged period. Still, the ultimate result can be the formation of a rich, multifaceted identity (Quintana, 2007; Jensen, 2008; Klimstra et al., 2012).

Figure 12-1 Bicultural Identity in the United States

The number of Americans who identified themselves as belonging to more than one race grew substantially between 2000 and 2010. Almost 10 percent report belonging to three or more races.

(**Source:** U.S. Bureau of the Census, 2011.)



Depression and Suicide: Psychological Difficulties in Adolescence

LO 12.6 Identify the dangers adolescents face as they deal with the stresses of their age.

As she entered ninth grade, it struck Leanne Taunton that she was stuck without hope inside a dreadful world. "It was like the air was a big weight pressing in on me from all sides." A friend listened to her sympathetically and invited her to her basement. "We started doing drugs, using whatever was in the medicine cabinet. At first it seemed to offer some relief, but in the end we both had to go home again, if you know what I mean."

One day Leanne grabbed her father's razor, filled up the tub, and slashed her wrists. At the age of 14 she had had enough.

Although by far the majority of teenagers weather the search for identity—as well as the other challenges presented by the period—without major psychological difficulties, some find adolescence particularly stressful. Some, in fact, develop severe psychological problems. Two of the most serious are adolescent depression and suicide.

ADOLESCENT DEPRESSION. No one is immune to periods of sadness, unhappiness, and feeling emotionally upset, and adolescents are no exception. The end of a relationship, failure at an important task, the death of a loved one—all may produce profound feelings of sadness, loss, and grief. In situations such as these, depression is a fairly typical reaction.

How common are feelings of depression in adolescence? More than a quarter of adolescents report feeling so sad or hopeless for two or more weeks in a row that they stop doing their normal activities. Almost two-thirds of teenagers say they have experienced such feelings at one time or another. On the other hand, only a small minority of adolescents—some 3 percent—experience *major depressive disorder*,

Between 25 and 40 percent of girls, and 20 to 35 percent of boys, experience occasional episodes of depression during adolescence, although the incidence of major depression is far lower.

a full-blown psychological disorder in which depression is severe and lingers for long periods (Grunbaum et al., 2001; Galambos, Leadbeater, & Barker, 2004).

Gender, ethnic, and racial differences are also found in depression rates. As is the case among adults, adolescent girls, on average, experience depression more often than boys. Some studies have found that African American adolescents have higher rates of depression than white adolescents, although not all research supports this conclusion. Native Americans, too, have higher rates of depression (Zahn-Waxler, Shirtcliff, & Marceau, 2008; Sanchez, Lambert, & Ialongo, 2012; English, Lambert & Ialongo, 2014).

In cases of severe, long-term depression, biological factors are often involved. Although some adolescents seem to be genetically predisposed to experience depression, environmental and social factors relating to the extraordinary changes in the social lives of adolescents are also important influences. An adolescent who experiences the death of a loved one, for example, or one who grows up with an alcoholic or a depressed parent is at a higher risk of depression. In addition, being unpopular, having few close friends, and experiencing rejection are associated with adolescent depression (Eley, Liang, & Plomin, 2004; Zalsman et al., 2006; Herberman Mash et al., 2014).

One of the most puzzling questions about depression is why its incidence is higher among girls than boys. There is little evidence that it is linked to hormone differences or a particular gene. Instead, some psychologists speculate that stress is more pronounced for girls than for boys in adolescence due to the many, sometimes conflicting, demands of the traditional female gender role. Recall, for instance, the situation of the adolescent girl who was quoted in our discussion of self-esteem. She worries not only about doing well in school but also about being popular. If she feels that academic success undermines her popularity, she is placed in a bind that can leave her feeling helpless. Added to this is that traditional gender roles still give higher status to men than to women (Hyde, Mezulis, & Abramson, 2008; Chaplin, Gillham, & Seligman, 2009; Castelao & Kröner-Herwig, 2013).

Girls' generally higher levels of depression during adolescence may also reflect gender differences in ways of coping with stress rather than gender differences in mood. Girls may be more apt than boys to react to stress by turning inward, thereby experiencing a sense of helplessness and hopelessness. In contrast, boys more often react by externalizing the stress and acting more impulsively or aggressively, or by turning to drugs and alcohol (Wisdom Agnor, 2007; Wu et al., 2007; Brown et al., 2012).

ADOLESCENT SUICIDE. The rate of adolescent suicide in the United States has tripled in the last 30 years. One teenage suicide occurs every 90 minutes, for an annual rate of 12.2 suicides per 100,000 adolescents. Moreover, the reported rate may actually understate the true number of suicides; parents and medical personnel are often reluctant to report a death as suicide, preferring to label it an accident. Even with underreporting, suicide is the third most common cause of death in the 15- to 24-year-old age group, after accidents and homicide. It is important to keep in mind, however, that although the suicide rate has risen more for adolescents than for other age groups, the highest rate of suicide is found in the period of late adulthood (Healy, 2001; Grunbaum et al., 2002; Joe & Marcus, 2003; Conner & Goldston, 2007).

The rate of adolescent suicide has tripled in the last 30 years. These students mourn following the suicide of a classmate.

In adolescence, the rate of suicide is higher for boys than girls, although girls *attempt* suicide more frequently. Suicide attempts among males are more likely to result in death because of the methods they use: Boys tend to use more violent means, such as guns, while girls are more apt to choose a drug overdose. Some estimates suggest that there are as many as 200 attempted suicides by both sexes for every successful one (Dervic et al., 2006; Pompili et al., 2009; Payá-González et al., 2015).

The reasons behind the increase in adolescent suicide over past decades are unclear. The most obvious explanation is that the stress experienced by teenagers has increased, leading those who are most vulnerable to be more likely to commit suicide. But why should stress have increased only for adolescents given that the suicide rate for other segments of the population has remained fairly stable over the same time period? Although we are not yet sure why adolescent suicide has increased, it is clear that certain factors heighten the risk of suicide. One factor is depression. Depressed teenagers who are experiencing a profound sense of hopelessness are at greater risk of committing suicide (although most depressed individuals do not commit suicide). In addition, social inhibition, perfectionism, and a high level of stress and anxiety are related to a greater risk of suicide. The easy availability of guns—which are more prevalent in the United States than in other industrialized nations—also contributes to the suicide rate (Wright, Wintemute, & Claire, 2008; Hetrick et al., 2012).

In addition to depression, some cases of suicide are associated with family conflicts and relationship or school difficulties. Others stem from a history of abuse and neglect. The rate of suicide among drug and alcohol abusers is also relatively high. As can be seen in Figure 12-2, teens who called in to a hotline because they were thinking of killing themselves mentioned several other factors as well (Lyon et al., 2000; Bergen, Martin, & Richardson, 2003; Wilcox, Conner, & Caine, 2004).

Some suicides appear to be caused by exposure to the suicide of others. In *cluster suicide*, one suicide leads to attempts by others to kill themselves. For instance, some high schools have experienced a series of suicides following a well-publicized case. As a result, many schools have established crisis intervention teams to counsel students when a student commits suicide (Insel & Gould, 2008; Daniel & Goldston, 2009; Abrutyn & Mueller, 2014).

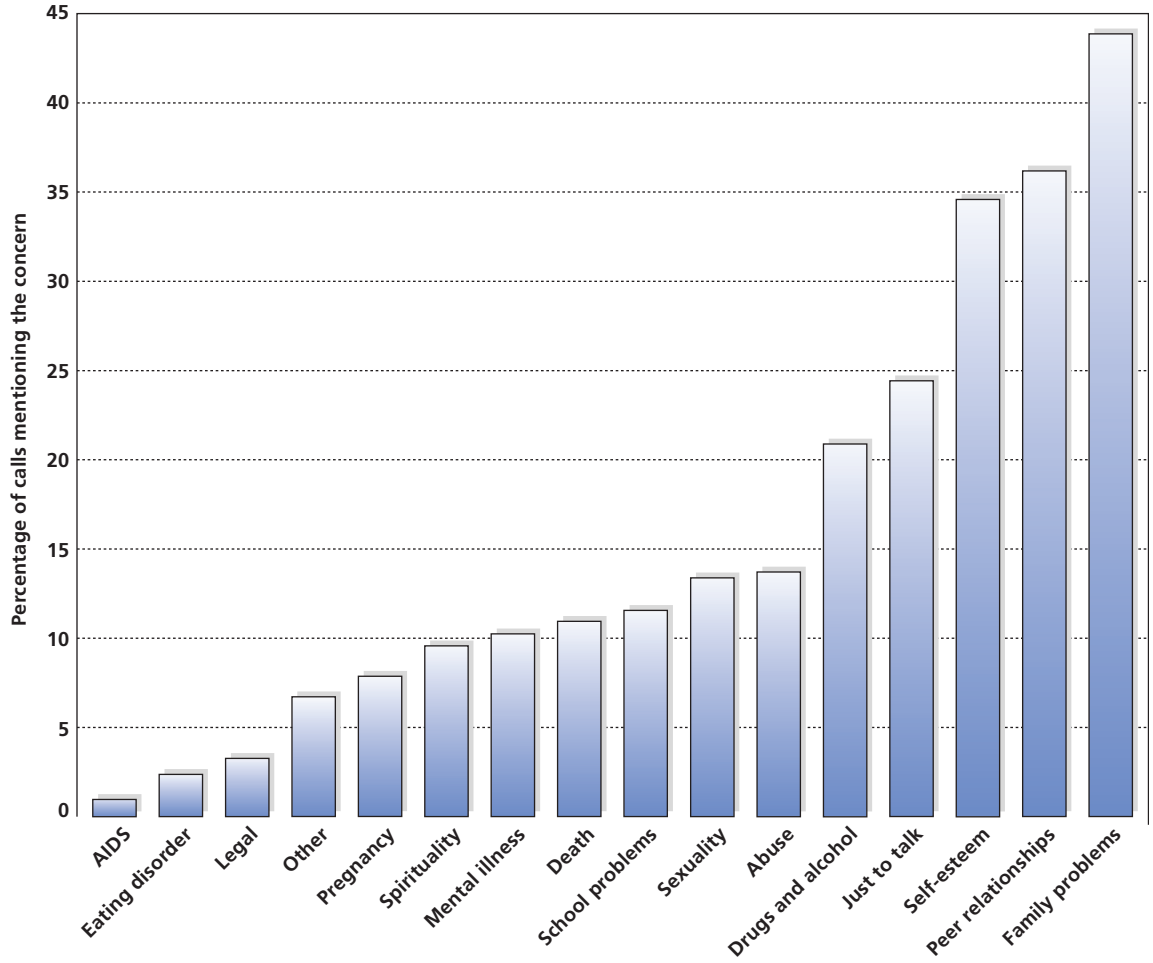
Several warning signs should sound an alarm regarding the possibility of suicide, including the following:

- Direct or indirect talk about suicide, such as "I wish I were dead" or "You won't have me to worry about any longer"
- School difficulties, such as missed classes or a decline in grades
- Making arrangements as if preparing for a long trip, such as giving away prized possessions or arranging for the care of a pet
- Writing a will
- Loss of appetite or excessive eating
- General depression, including a change in sleeping patterns, slowness and lethargy, and uncommunicativeness
- Dramatic changes in behavior, such as a shy person suddenly acting outgoing
- Preoccupation with death in music, art, or literature

Figure 12-2 Adolescent Difficulties

Family, peer relationships, and self-esteem problems were most often mentioned by adolescents contemplating suicide, according to a review of phone calls to a telephone help line.

(**Source:** Based on Boehm & Campbell, 1995.)



Are You an Informed Consumer of Development?

Adolescent Suicide: How to Help

If you suspect that an adolescent, or anyone else for that matter, is contemplating suicide, don't stand idly by. Act! Here are several suggestions:

- Talk to the person, listen without judging, and give the person an understanding forum in which to try to talk things through.
- Talk specifically about suicidal thoughts, asking such questions as: Does the person have a plan? Has he or she bought a gun? Where is it? Has he or she stockpiled pills? Where are they? The Public Health Service notes that, "contrary to popular belief, such candor will not give a person dangerous ideas or encourage a suicidal act."
- Evaluate the situation, trying to distinguish between general upset and more serious danger, as when suicide plans *have* been made. If the crisis is acute, *do not leave the person alone*.
- Be supportive, let the person know you care, and try to break down his or her feelings of isolation.
- Take charge of finding help, without concern about invading the person's privacy. Do not try to handle the problem alone; get professional help immediately.
- Make the environment safe, removing from the premises (not just hiding) weapons such as guns, razors, scissors, medication, and other potentially dangerous household items.
- Do not keep suicide talk or threats secret; these are calls for help and call for immediate action.

- Do not challenge, dare, or use verbal shock treatment on suicidal persons in an effort to make them realize the errors in their thinking. These can have tragic effects.
- Make a contract with the person, getting a promise or commitment, preferably in writing, not to make any suicidal attempt until you have talked further.
- Don't be overly reassured by a sudden improvement of mood. Such seemingly quick recoveries sometimes reflect the relief of finally deciding to commit suicide or the temporary release of talking to someone, but most likely the underlying problems have not been resolved.

For immediate help with a suicide-related problem, call (800) 784-2433 National Suicide Prevention Lifeline or (800) 621-4000, National Runaway Switchboard national hotlines staffed with trained counselors.

Module 12.1 Review

- Self-concept during adolescence grows more differentiated as the view of the self becomes more organized, broader, and more abstract, and takes account of the views of others. Self-esteem, too, grows increasingly differentiated as the adolescent develops the ability to place different values on different aspects of the self.
- Erikson's identity-versus-identity-confusion stage focuses on the adolescent's struggle to determine an identity and a role in society. Those who are successful in forming an identity prepare themselves for future development.
- Marcia's four categories of adolescent identity—identity achievement, identity foreclosure, moratorium, and identity diffusion—are based on the presence of absence or crisis and commitment. The most psychologically healthy adolescents are in the identity achievement category.
- Increased cognitive abilities allow adolescents to think more abstractly about religious and spiritual matters. As they question their religious identity, they may draw a distinction between organized religion and a personal sense of spirituality.
- Ethnic and minority adolescents must navigate a course through two models of societal acceptance: the cultural assimilation model and the pluralistic society model. For these teenagers, identity development includes the development of a racial and ethnic identity. A third model—forming a bicultural identity—is available to them.
- One of the dangers that adolescents face is depression, which affects girls more than boys. Suicide is the third most common cause of death among 15- to 24-year-olds.

Journal Writing Prompt

Applying Lifespan Development: What are some consequences of the shift from reliance on adults to reliance on peers? Are there advantages? Dangers?

Relationships: Family and Friends

When 13-year-old Emma tells her father about her friend Nia's upcoming dance party, he says he'll pick her up at 1 a.m. Emma goes ballistic. "One a.m.!" she scoffs, "Dad, it's a SLEEPover! Everybody's getting picked up at noon the next day." Her father asks, "And when will the boys be going home?" Emma looks at him with disbelief. "Noon the next day, same as everyone."

Her father sighs. "There is no way you are going to sleep over anywhere where there are boys." Emma's disbelief is palpable. "But Dad" she explains impatiently, "Nia's mother will be there. Nothing's going to happen. Nobody's going to sleep anyway."

Speechless, Emma's father signals time out, resolving to talk to other parents about this strange new world he has somehow landed in.

The social world of adolescents is considerably wider than that of younger children. As adolescents' relationships with people outside the home grow increasingly important, their interactions with their families evolve and take on a new, and sometimes difficult, character (Collins, Gleason, & Sesma, 1997; Collins & Andrew, 2004).

Family Ties: Changing Relations with Relations

LO 12.7 Describe what family relationships are like during adolescence.

When Paco Lizzagara entered junior high school, his relationship with his parents changed drastically. What had been a good relationship had become tense by the middle of seventh grade. Paco felt his parents always seemed to be "on his case." Instead of giving him more freedom, which he felt he deserved at age 13, they actually seemed to be becoming more restrictive.

Paco's parents would probably see things differently. They would likely suggest that they were not the source of the tension in the household—Paco was. From their point of view, Paco, with whom they'd established what seemed to be a close, stable, loving relationship throughout much of his childhood, suddenly seemed transformed. They felt he was shutting them out of his life, and when he did speak with them, it was merely to criticize their politics, their dress, their preferences in TV shows. To his parents, Paco's behavior was upsetting and bewildering.

THE QUEST FOR AUTONOMY. Parents are sometimes angered, and even more frequently puzzled, by adolescents' conduct. Children who have previously accepted their parents' judgments, declarations, and guidelines begin to question—and sometimes rebel against—their parents' views of the world.

autonomy
independence and a sense of control over one's life

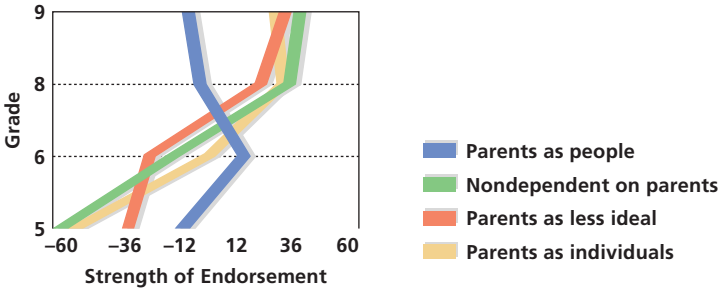
These clashes are caused in part by the shifting roles that both children and parents must deal with during adolescence. Adolescents increasingly seek **autonomy**, independence and a sense of control over their lives. Most parents intellectually realize that this shift is a normal part of adolescence, representing one of the primary developmental tasks of the period, and in many ways they welcome it as a sign of their children's growth. However, in many cases the day-to-day realities of adolescents' increasing autonomy may prove difficult for them to handle (Smetana, 1995). But understanding this growing independence intellectually and agreeing to allow a teen to attend a party when no parents will be present are two different things. To the adolescent, her parents' refusal indicates a lack of trust or confidence. To the parent, it's simple good sense: "I trust you," they may say. "It's everyone else who will be there that I worry about."

In most families, teenagers' autonomy grows gradually over the course of adolescence. For instance, one study of changes in adolescents' views of their parents found that increasing autonomy led them to perceive parents less in idealized terms and more as persons in their own right. For example, rather than seeing their parents as authoritarian disciplinarians mindlessly reminding them to do their homework, they may come to see their parents' emphasis on excelling in school as evidence of parental regrets about their own lack of education and a wish to see their children have more options in life. At the same time, adolescents come to depend more on themselves and to feel more like separate individuals (see Figure 12-3).

Figure 12-3 Changing Views of Parents

As adolescents become older, they come to perceive their parents in less idealized terms and more as individuals. What effect is this likely to have on family relations?

(**Source:** Based on Steinberg & Silverberg, 1986.)



The increase in adolescent autonomy changes the relationship between parents and teenagers. At the start of adolescence, the relationship tends to be asymmetrical: Parents hold most of the power and influence over the relationship. By the end of adolescence, however, power and influence have become more balanced, and parents and children end up in a more symmetrical, or egalitarian, relationship. Power and influence are shared, although parents typically retain the upper hand (Goede, Branje, & Meeus, 2009; Inguglia et al., 2014).

CULTURE AND AUTONOMY. The degree of autonomy that is eventually achieved varies from one family and one child to the next. Cultural factors play an important role. In Western societies, which tend to value individualism,

adolescents seek autonomy at a relatively early stage of adolescence. In contrast, Asian societies are collectivistic; they promote the idea that the well-being of the group is more important than that of the individual. In such societies, adolescents' aspirations to achieve autonomy are less pronounced (Raeff, 2004; Supple et al., 2009; Perez-Brena, Updegraff, & Umaña-Taylor, 2012).

Adolescents from different cultural backgrounds also vary in their feelings of obligation to their family. More than those from more individualistic societies, adolescent in more collectivistic cultures tend to feel greater obligation to their families, in terms of fulfilling their expectations about their duty to provide assistance, show respect, and support their families in the future. In collectivistic societies, the push for autonomy is less strong, and the timetable during which autonomy is expected to develop is slower (see Figure 12-4; Fuligni & Zhang, 2004; Leung, Pe-Pua, & Karnilowicz, 2006; Chan & Chan, 2013).

For example, when asked at what age an adolescent would be expected to carry out certain behaviors (such as going to a concert with friends), adolescents and parents provide different answers depending on their cultural background. In comparison to Asian adolescents and parents, Caucasian adolescents and parents indicate an earlier timetable, anticipating greater autonomy at an earlier age (Feldman & Wood, 1994).

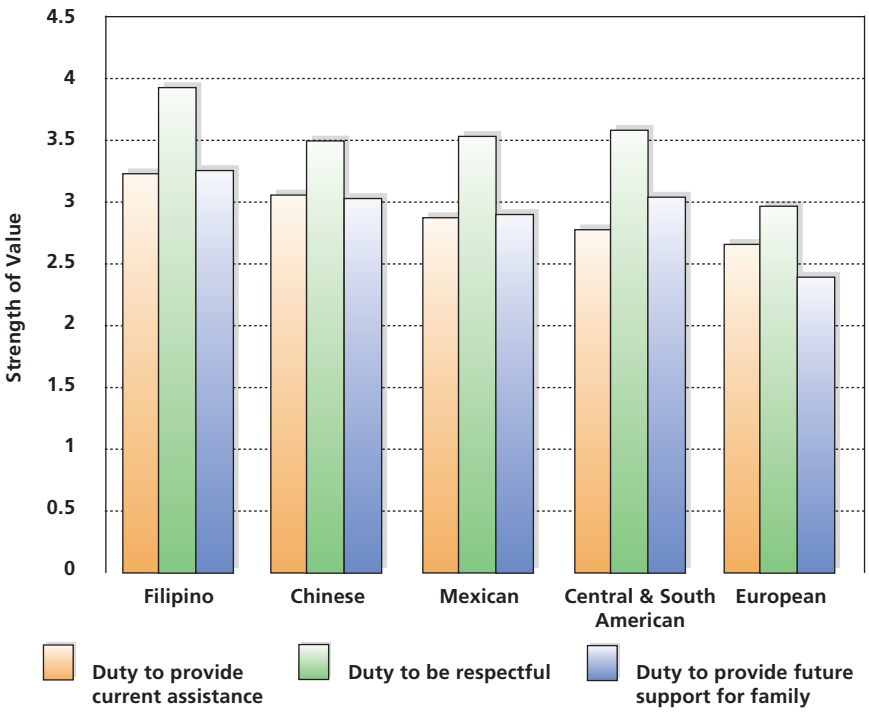
Does the more extended timetable for the development of autonomy in more collectivistic cultures have negative consequences for adolescents in those cultures? Apparently not. The more important factor is the degree of match between cultural expectations and developmental patterns. What probably matters most is how well the development of autonomy matches societal expectations, not the specific timetable of autonomy (Rothbaum et al., 2000; Zimmer-Gembeck & Collins, 2003; Updegraff et al., 2006).

In addition to cultural factors affecting autonomy, gender also plays a role. In general, male adolescents are permitted more autonomy at an earlier age than female adolescents. The encouragement of male autonomy is consistent with more general traditional male stereotypes, in which males are perceived as more independent and females,

Figure 12-4 Family Obligations

Adolescents from Asian and Latin American groups feel a greater sense of respect and obligation toward their families than those adolescents with European backgrounds.

(**Source:** Fuligni, Tseng, & Lam, 1999.)



conversely, as more dependent on others. The more parents hold traditional stereotypical views of gender, the less likely they are to encourage their daughters' autonomy (Bumpus, Crouter, & McHale, 2001).

THE MYTH OF THE GENERATION GAP. Teen movies often depict adolescents and their parents with totally opposing points of view about the world. For example, the parent of an environmentalist teen might turn out to own a polluting factory. These exaggerations are often funny because we assume there is a kernel of truth in them, in that parents and teenagers often don't see things the same way. According to this argument, there is a **generation gap**, a deep divide between parents and children in attitudes, values, aspirations, and worldviews.

generation gap
a divide between parents and adolescents in attitudes, values, aspirations, and worldviews

The reality, however, is quite different. The generation gap, when it exists, is really quite narrow. Adolescents and their parents tend to see eye to eye in a variety of domains. Republican parents generally have Republican children; members of the Christian right have children who espouse similar views; parents who advocate for abortion rights have children who are pro-abortion. On social, political, and religious issues, parents and adolescents tend to be in synch, and children's worries mirror those of their parents. Adolescents' concerns about society's problems (see Figure 12-5) are those with which most adults would probably agree (Knafo & Schwartz, 2003; Smetana, 2005; Grønhøj & Thøgersen, 2012).

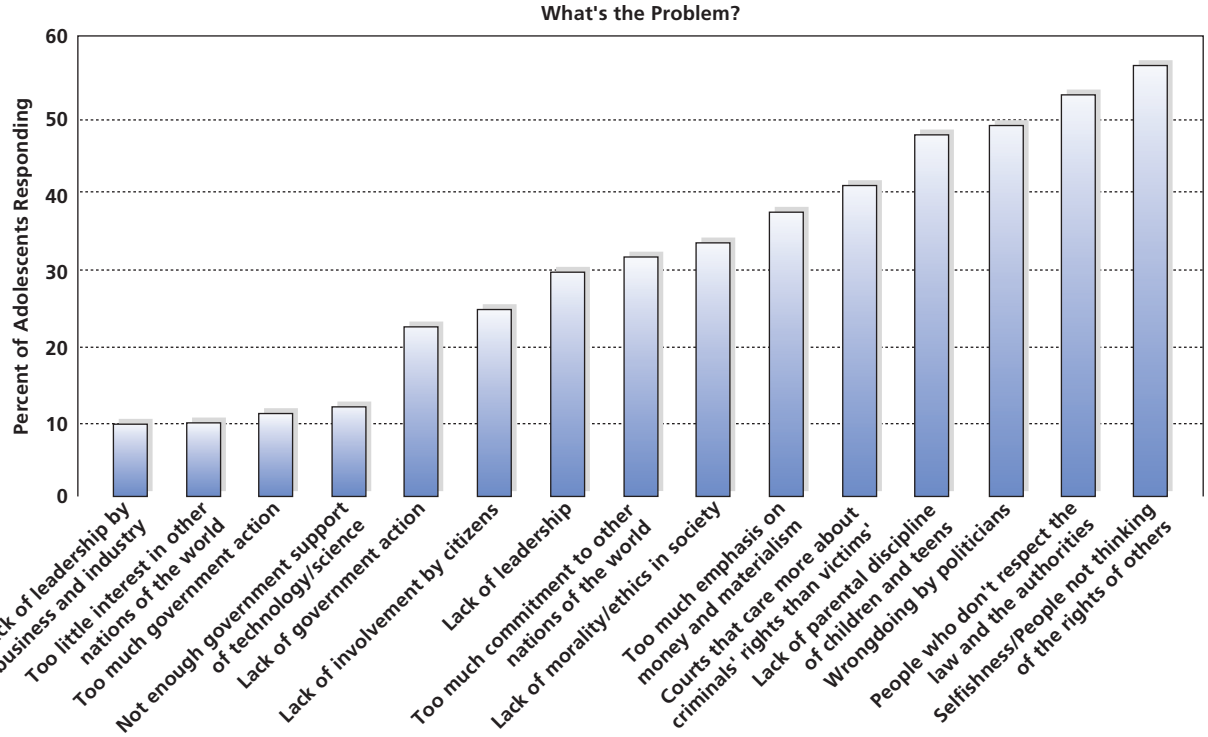
As we have stated, most adolescents and their parents get along quite well. Despite their quest for autonomy and independence, most adolescents have deep love, affection, and respect for their parents—and parents feel the same way about their children. Although some parent–adolescent relationships are seriously troubled, the majority of relationships are more positive than negative and help adolescents avoid the kind of peer pressure we'll discuss later in the chapter (Resnick et al., 1997; Black, 2002; Coleman, 2014).

Even though adolescents spend decreasing amounts of time with their families in general, the amount of time they spend alone with each parent remains remarkably

Figure 12-5 What's the Problem?

Parents are most likely to agree with their adolescents' views of society's ills.

(**Source:** Based on PRIMEDIA/Roper National Youth Survey, 1999.)

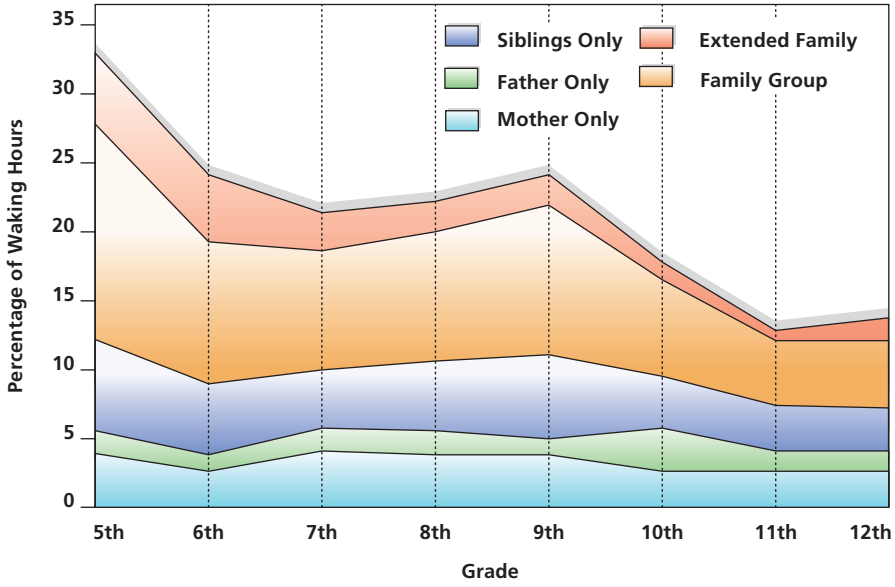


stable across adolescence (see Figure 12-6). In short, there is no evidence suggesting that family problems are worse during adolescence than at any other stage of development (Larson et al., 1996; Granic, Hollenstein, & Dishion, 2003).

Figure 12-6 Time Spent by Adolescents with Parents

Despite their quest for autonomy and independence, most adolescents have deep love, affection, and respect for their parents, and the amount of time they spend alone with each parent (the lower two segments) remains remarkably stable across adolescence.

(**Source:** Larson et al., 1996.)



CONFLICTS WITH PARENTS. Of course, if most adolescents get along with their parents most of the time, that means some of the time they don't. No relationships are always sweetness and light. Parents and teens may hold similar attitudes about social and political issues, but they often hold different views on matters of personal taste, such as music preferences and styles of dress. Also, as we've seen, parents and children may run into disagreements when children seek to achieve autonomy and independence sooner than parents feel is right. Consequently, parent–child conflicts are more likely to occur during adolescence, particularly during the early stages, although it's important to remember that not every family is affected to the same degree (Arnett, 2000; Smetana, Daddis, & Chuang, 2003; García-Ruiz et al., 2013).

Why should conflict be greater during early adolescence than at later stages of the period? According to developmental psychologist Judith Smetana, the reason involves differing definitions of, and rationales for, appropriate and inappropriate conduct. On one hand, parents may feel, for instance, that getting one's ear pierced in three places is inappropriate because society traditionally deems it inappropriate. On the other hand, adolescents may view the issue in terms of personal choice (Smetana, 2006; Rote et al., 2012; Sorkhabi & Middaugh, 2014).

Furthermore, the newly sophisticated reasoning of adolescents (discussed in the previous chapter) leads teenagers to think about parental rules in more complex ways. Arguments that might be convincing to a school-age child ("Do it because I tell you to do it") are less compelling to an adolescent.

The argumentativeness and assertiveness of early adolescence at first may lead to an increase in conflict, but in many ways these qualities play an important role in the evolution of parent–child relationships. Although parents may initially react defensively to the challenges that their children present, and may grow inflexible and rigid, in most cases they eventually come to realize that their children *are* growing up and that they want to support them in that process.

As parents come to see that their adolescent children's arguments are often compelling and not so unreasonable, and that their daughters and sons can in fact be trusted with more freedom, they become more yielding, allowing, and eventually perhaps even encouraging independence. As this process occurs during the middle stages of adolescence, the combativeness of early adolescence declines.

This pattern does not apply for all adolescents. Although the majority of teenagers maintain stable relations with their parents throughout adolescence, as many as 20 percent pass through a fairly rough time (Dmitrieva, Chen, & Greenberg, 2004).

CULTURAL DIFFERENCES IN PARENT–CHILD CONFLICTS DURING ADOLESCENCE. Although parent–child conflicts are found in every culture, there does seem to be less conflict between parents and their teenage children in "traditional," preindustrial

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ADOLESCENT CONFLICT WITH PARENTS ACROSS CULTURES

cultures. Teens in such traditional cultures also experience fewer mood swings and instances of risky behavior than do teens in industrialized countries (Arnett, 2000; Nelson, Badger, & Wu, 2004; Kapadia, 2008; Jensen & Dost-Gözkan, 2014).

Why? The answer may relate to the degree of independence that adolescents expect and adults permit. In more industrialized societies, in which the value of individualism is typically high, independence is an expected component of adolescence. Consequently, adolescents and their parents must negotiate the amount and timing of the adolescent's increasing independence—a process that often leads to strife.

In contrast, in more traditional societies, individualism is not valued as highly, and therefore adolescents are less inclined to seek out independence. With diminished independence-seeking on the part of adolescents, the result is less parent–child conflict (Dasen & Mishra, 2000, 2002).

Relationships with Peers: The Importance of Belonging

LO 12.8 Explain how relationships with peers change during adolescence.

In the eyes of many parents, the most fitting symbol of adolescence is the cell phone, on which incessant texting occurs. For many of their sons and daughters, communicating with friends is experienced as an indispensable lifeline, sustaining ties to individuals with whom they may have already spent many hours earlier in the day.

The seemingly compulsive need to communicate with friends demonstrates the role that peers play in adolescence. Continuing the trend that began in middle childhood, adolescents spend increasing amounts of time with their peers, and the importance of peer relationships grows as well. There is probably no period of life in which peer relationships are as important as they are in adolescence.

SOCIAL COMPARISON. Peers become more important in adolescence for a number of reasons. For one thing, they provide each other with the opportunity to compare and evaluate opinions, abilities, and even physical changes—a process called *social comparison.* Because the physical and cognitive changes of adolescence are so unique to this age group and so pronounced, especially during the early stages of puberty, adolescents turn increasingly to others who share, and consequently can shed light on, their own experiences (Rankin, Lane, & Gibbons, 2004; Schaefer & Salafia, 2014).

Parents are unable to provide social comparison. Not only are they well beyond the changes that adolescents undergo, but also adolescents' questioning of adult authority and their motivation to become more autonomous make parents, other family members, and adults in general inadequate and invalid sources of knowledge. Who is left to provide such information? Peers.

reference groups
groups of people with whom one compares oneself

REFERENCE GROUPS. As we have said, adolescence is a time of experimentation, of trying out new identities, roles, and conduct. Peers provide information about what roles and behavior are most acceptable by serving as a reference group. **Reference groups** are groups of people with whom one compares oneself. Just as a professional ballplayer is likely to compare his performance against that of other professional players, so do teenagers compare themselves to those who are similar to them.

Reference groups present a set of *norms*, or standards, against which adolescents can judge their abilities and social success. An adolescent need not even belong to a group for it to serve as a reference group. For instance, unpopular adolescents may find themselves belittled and rejected by members of a popular group, yet use that more popular group as a reference group (Berndt, 1999).

CLIQUES AND CROWDS: BELONGING TO A GROUP. One of the consequences of the increasing cognitive sophistication of adolescents is the ability to group others in more

discriminating ways. Consequently, even if they do not belong to the group they use for reference purposes, adolescents typically are part of some identifiable group. Rather than defining people in concrete terms relating to what they do ("football players" or "musicians") as a younger school-age child might, adolescents use more abstract terms packed with greater subtleties ("jocks" or "skaters" or "stoners") (Brown, 2004).

Adolescents tend to belong to two types of groups: cliques and crowds. **Cliques** are groups of 2 to 12 people whose members have frequent social interactions with one another. In contrast, **crowds** are larger, comprising individuals who share particular characteristics but who may not interact with one another. For instance, "jocks" and "nerds" are representative of crowds found in many high schools.

cliques
groups of 2 to 12 people whose members have frequent social interactions with one another

crowds
larger groups than cliques, composed of individuals who share particular characteristics but who may not interact with one another

Membership in particular cliques and crowds is often determined by the degree of similarity with members of the group. One of the most important dimensions of similarity relates to substance use; adolescents tend to choose friends who use alcohol and other drugs to the same extent that they do. Their friends are also often similar in terms of their academic success, although this is not always true. For instance, during early adolescence, attraction to peers who are particularly well behaved seems to decrease, while, at the same time, those who behave more aggressively become more attractive (Kupersmidt & Dodge, 2004; Hutchinson & Rapee, 2007; Kiuru et al., 2009).

The emergence of distinct cliques and crowds during adolescence reflects in part the increased cognitive capabilities of adolescents. Group labels are abstractions, requiring teens to make judgments of people with whom they may interact only rarely and of whom they have little direct knowledge. It is not until mid-adolescence that teenagers are sufficiently sophisticated cognitively to make the subtle judgments that underlie distinctions between different cliques and crowds (Burgess & Rubin, 2000; Brown & Klute, 2003; also see the *From Research to Practice* box).

GENDER RELATIONS. As children enter adolescence from middle childhood, their groups of friends are composed almost universally of same-sex individuals. Boys hang out with boys; girls hang out with girls. Technically, this sex segregation is called the **sex cleavage**.

sex cleavage
sex segregation in which boys interact primarily with boys and girls primarily with girls

From Research to Practice

Empathy in Adolescence

Think back to when you were in your middle teens and how you related to other people then. Were you sometimes unreasonably demanding or unsympathetic to your parents, or perhaps did you sometimes make hurtful jokes or tease people because others found it funny? If so, don't feel bad—if you're male, at least—because recent research makes a good case that it was in part your brain to blame, not you.

Cognitive empathy is the ability to understand other people's perspective, and it plays an important role in problem solving and in avoiding conflict. *Affective empathy* is the related ability to understand what other people are feeling, enabling us to respond to others appropriately. Our capacities for understanding and taking into account what other people are thinking and feeling are vital for forming healthy relationships and getting along well with others. These important abilities were once thought to fully develop very early in life—even infants mimic facial expressions and social smiles, for example, and children offer comfort to others who are sad (Crone & Dahl, 2012; Ladouceur et al., 2012).

But a six-year study revealed that cognitive empathy really begins taking hold in girls at around age 13, and in boys at around age 15. Moreover, although affective empathy remains steady throughout adolescence for girls, boys show a temporary drop between ages 13 and 16. Part of the reason for this decline may be the increase in testosterone production that occurs during these years in boys, as testosterone is associated with dominance. The boys in the study who were more physically mature did also tend to be less empathetic. An alternative explanation invokes the socialization of masculinity in boys—boys at that age feel pressure to start acting manly, which they may believe necessitates the squelching of feelings (Van der Graaf et al., 2014).

The changes can be distressing for parents and teachers, as when teenage boys go through a period of being sullen and rude. But happily, affective empathy rebounds in late adolescence and can be encouraged by open discussion of one's own and others' feelings (Miklikowska, Duriez, & Soenens, 2011).

Shared Writing Prompt

What might parents of teenage boys be able to do to encourage their sons to be more empathetic?

The sex segregation of childhood continues during the early stages of adolescence. However, by the time of middle adolescence, this segregation decreases, and boys' and girls' cliques begin to converge.

This situation changes as members of both sexes enter puberty. Boys and girls experience the hormonal surge that marks puberty and causes the maturation of the sex organs (see Chapter 11). At the same time, societal pressures suggest that the time is appropriate for romantic involvement. These developments lead to a change in the ways adolescents view the opposite sex. Whereas a 10-year-old is likely to see every member of the other sex as "annoying" and "a pain," heterosexual teenage boys and girls begin to regard each other with greater interest in terms of both personality and sexuality. (For gays and lesbians, pairing off holds other complexities, as we will discuss later when we consider adolescent dating.)

As they move into puberty, boys' and girls' cliques, which previously had moved along parallel but separate tracks, begin to converge. Adolescents begin to attend boy–girl dances or parties, although mostly the boys still spend their time with boys, and the girls with girls (Richards et al., 1998).

A little later, however, adolescents increasingly spend time with members of the other sex. New cliques emerge, composed of both males and females. Not everyone participates initially: Early on, the teenagers who are leaders of the same-sex cliques and who have the highest status lead the way. Eventually, however, most adolescents find themselves in cliques that include boys and girls.

Cliques and crowds undergo yet another transformation at the end of adolescence: they become less influential and may dissolve as a result of the increased pairing off that occurs. Furthermore, they are affected by diversity issues, as we discuss in the *Developmental Diversity and Your Life* feature.

Developmental Diversity and Your Life

Race Segregation: The Great Divide of Adolescence

When Robert Corker, a student at Tufts University, first stepped into the gym, he was immediately pulled into a pick-up basketball game. "The guys thought I'd be good at basketball just because I'm tall and black. Actually, I stink at sports and quickly changed their minds. Fortunately we all laughed about it later," Robert says.

* * *

When Sandra Cantú, a Puerto Rican nursing student at the University of Alabama, entered the cafeteria wearing her hospital whites, two female students assumed she was a cafeteria worker and asked her to clear off their table.

* * *

Race relations are no easier for white students to manage. Ted Connors, a white senior at Southern Methodist, recalls the day he asked a student in his dorm for help with his Spanish homework. "He laughed in my face," Ted recalls, "I assumed he spoke Spanish just because his name was Gonzalez. Actually, he had grown up in Michigan and spoke only English. It took quite a while to live that one down."

* * *

The pattern of racial misunderstanding experienced by these students is repeated over and over in schools and colleges throughout the United States: Even when they attend desegregated schools with significant ethnic and racial diversity, people of different ethnicities and races interact very little. Moreover, even if they have a friend of a different ethnicity within the confines of a school, most adolescents don't interact with that friend outside of school (DuBois & Hirsch, 1990).

It doesn't start out this way. During elementary school and even during early adolescence, there is a fair amount of integration among students of differing ethnicities. However, by middle and late adolescence, the amount of segregation is striking (Ennett & Bauman, 1996; Knifsend & Juvonen, 2014).

Why should racial and ethnic segregation be the rule, even in schools that have been desegregated for some time? One reason is that minority students may actively seek support

from others who share their minority status (where "minority" is used in its sociological sense to indicate a subordinate group whose members lack power, compared to members of a dominant group). By associating primarily with other members of their own group, members of minority groups are able to affirm their own identity.

Members of different racial and ethnic groups may be segregated in the classroom as well. As we discussed in Chapter 10, because certain groups have been historically discriminated against, members of these minority groups tend to experience less school success than members of the majority group. It may be that ethnic and racial segregation in high school is based not on ethnicity itself but on academic achievement.

If minority group members experience less academic success, they may find themselves in classes with proportionally fewer majority group members. Similarly, majority students may be in classes with few minority students. Such class assignment practices, then, may inadvertently maintain and promote racial and ethnic segregation. This pattern would be particularly prevalent in schools where rigid academic tracking is practiced, with students assigned to "low," "medium," and "high" tracks depending on their prior achievement (Lucas & Behrends, 2002).

The lack of contact among students of different racial and ethnic backgrounds in school may also reflect prejudice, both perceived and real, toward members of other groups. Students of color may feel that the white majority is prejudiced, discriminatory, and hostile, and they may prefer to stick to same-race groups. Conversely, white students may assume that minority group members are antagonistic and unfriendly. Such mutually destructive attitudes reduce the likelihood that meaningful interaction can take place (Phinney, Ferguson, & Tate, 1997; Tropp, 2003).

Is this sort of voluntary segregation along racial and ethnic lines found during adolescence inevitable? No. Adolescents who have interacted regularly and extensively with those of different races earlier in their lives are more likely to have friends of different races. Schools that actively promote contact among members of different ethnicities in classes help create an environment in which cross-race friendships can flourish. More generally, cross-group friendships promote more positive intergroup attitudes (Hewstone, 2003; Davies et al., 2011).

Still, the task is daunting. Many societal pressures act to keep members of different races from interacting with one another. Peer pressure, too, may encourage this as some cliques may actively promote norms that discourage group members from crossing racial and ethnic lines to form new friendships.

Popularity and Conformity

LO 12.9 Discuss what it means to be popular and unpopular in adolescence and how adolescents respond to peer pressure.

If you think back to your own adolescence, you'll probably have a good sense of your own popularity. You're not alone: popularity is an important dimension of adolescent life.

POPULARITY AND REJECTION. Most adolescents have well-tuned antennae when it comes to determining who is popular and who is not. For some teenagers, concerns over popularity—or lack of it—may be a central focus of their lives.

Actually, the social world of adolescents is not divided solely into popular and unpopular individuals; the differentiations are more complex (see Figure 12-7). For instance, some adolescents are controversial; in contrast to *popular* adolescents, who are mostly liked, **controversial adolescents** are liked by some and disliked by others. For example, a controversial adolescent may be highly popular within a particular group, such as the string orchestra but not popular among other classmates. Furthermore, there are **rejected adolescents**, who are uniformly disliked, and **neglected adolescents**, who are neither liked nor disliked. Neglected adolescents are the forgotten students—the ones whose status is so low that they are overlooked by almost everyone.

In most cases, popular and controversial adolescents tend to be similar in that their overall status is higher, while rejected and neglected adolescents share a generally lower status. Popular and controversial adolescents have more close friends, engage more frequently in activities with their peers, and disclose more about themselves to others than less popular students. They are also more involved in extracurricular school activities. In addition, they are well aware of their popularity, and they are less lonely than their less popular classmates (Becker & Luthar, 2007; Closson, 2009; Estévez, et al., 2014).

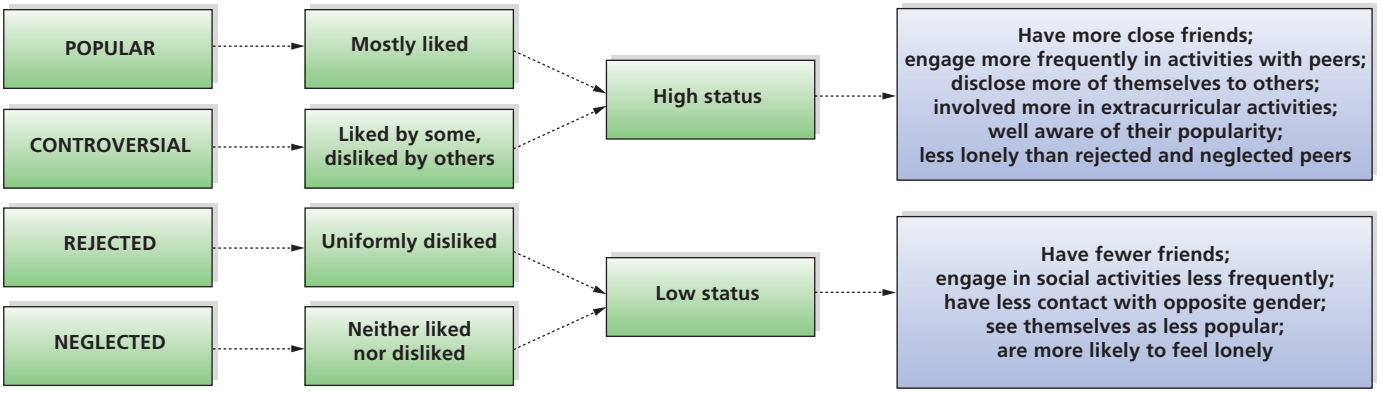
controversial adolescents
children who are liked by some peers and disliked by others

rejected adolescents
children who are actively disliked and whose peers may react to them in an obviously negative manner

neglected adolescents
children who receive relatively little attention from their peers in the form of either positive or negative interactions

Figure 12-7 The Social World of Adolescence

An adolescent's popularity can fall into one of four categories, depending on the opinions of his or her peers. Popularity is related to differences in status, behavior, and adjustment.



In contrast, the social world of rejected and neglected adolescents is considerably less pleasant. They have fewer friends, engage in social activities less frequently, and have less contact with the opposite sex. They see themselves—accurately, it turns out—as less popular, and they are more likely to feel lonely. They may find themselves in conflicts with others, some of which escalate into full-blown fights that require mediation (McElhaney, Antonishak, & Allen, 2008; Woodhouse, Dykas, & Cassidy, 2012).

What is it that determines status in high school? As illustrated in Table 12-3, men and women have different perceptions. For example, college men suggest that physical attractiveness is the most important factor in determining high school girls' status, while college women believe it is a high school girl's grades and intelligence (Suitor et al., 2001).

CONFORMITY: PEER PRESSURE IN ADOLESCENCE. Whenever Aldos Henry said he wanted to buy a particular brand of sneakers or a certain style of shirt, his parents complained that he was just giving in to peer pressure and told him to make up his own mind about things.

peer pressure
the influence of one's peers to conform to their behavior and attitudes

In arguing with Aldos, his parents were subscribing to a view of adolescence that is quite prevalent in U.S. society: that teenagers are highly susceptible to **peer pressure**, the influence of one's peers to conform to their behavior and attitudes. Were his parents correct?

The research suggests that in some cases, adolescents *are* highly susceptible to the influence of their peers. For instance, when considering what to wear, whom to date,

Table 12-3 High School Status

According to college men		According to college women	
High-status high school girls:	**High-status high school boys:**	**High-status high school girls:**	**High-status high school boys:**
1. Are good-looking	1. Take part in sports	1. Have high grades and are intelligent	1. Take part in sports
2. Have high grades and are intelligent	2. Have high grades and are intelligent	2. Participate in sports	2. Have high grades and are intelligent
3. Take part in sports	3. Are popular with girls	3. Are sociable	3. Are sociable
4. Are sociable	4. Are sociable	4. Are good-looking	4. Are good-looking
5. Are popular with boys	5. Have nice cars	5. Have nice clothes	5. Participate in school clubs or government

Note: Results are based on responses from students at Louisiana State University, Southeastern Louisiana University, State University of New York at Albany, State University of New York at Stony Brook, University of Georgia, and the University of New Hampshire.

(**Source:** Based on Suitor et al., 2001.)

and what movies to see, adolescents are apt to follow the lead of their peers. Wearing the right clothes, down to a particular brand, sometimes can be a ticket to membership in a popular group. It shows you know what's what. When it comes to many nonsocial matters, however, such as choosing a career path or trying to solve a problem, adolescents are more likely to turn to an experienced adult (Phelan, Yu, & Davidson, 1994).

In short, particularly in middle and late adolescence, teenagers turn to those they see as experts on a given dimension. If they have social concerns, they turn to the people most likely to be experts—their peers. If the problem is one about which parents or other adults are most likely to have expertise, teenagers tend to turn to them for advice and are most susceptible to their opinions (Young & Ferguson, 1979; Perrine & Aloise-Young, 2004).

Overall, then, it does not appear that susceptibility to peer pressure suddenly soars during adolescence. Instead, adolescence brings about a change in the people to whom an individual conforms. Whereas children conform fairly consistently to their parents during childhood, in adolescence conformity shifts to the peer group, in part because pressures to conform to peers increase as adolescents seek to establish their identity apart from their parents.

Ultimately, however, adolescents conform less to both peers *and* adults as they develop increasing autonomy in their lives. As they grow in confidence and in the ability to make their own decisions, adolescents are more apt to remain independent and to reject pressures from others, no matter who those others are. Before they learn to resist the urge to conform to their peers, however, teenagers may get into trouble, often along with their friends (Cook, Buehler, & Henson, 2009; Monahan, Steinberg, & Cauffman, 2009; Meldrum, Miller, & Flexon, 2013).

undersocialized delinquents
adolescent delinquents who are raised with little discipline or with harsh, uncaring parental supervision

JUVENILE DELINQUENCY: THE CRIMES OF ADOLESCENCE. Adolescents, along with young adults, are more likely to commit crimes than any other age group. This is a misleading statistic in some respects: Because certain behaviors (such as drinking) are illegal for adolescents but not for older individuals, it is rather easy for adolescents to break the law by doing something that, were they a few years older, would be legal. But even when such crimes are disregarded, adolescents are disproportionately involved in violent crimes, such as murder, assaults, and rape, and in property crimes involving theft, robbery, and arson.

Although the number of violent crimes committed by U.S. adolescents over the past decade has declined, delinquency among some teenagers remains a significant problem. Violence is a major cause of nonfatal injuries among adolescents, and it is the second leading cause of death among youth aged 10 to 24 years in the United States.

Why do adolescents become involved in criminal activity? Some offenders, known as **undersocialized delinquents**, are adolescents who are raised with little discipline or with harsh, uncaring parental supervision. Although they are influenced by their peers, these children have not been socialized appropriately by their parents and were not taught standards of conduct to regulate their own behavior. Undersocialized delinquents typically begin criminal activities at an early age, well before the onset of adolescence (Hoeve et al., 2008).

Undersocialized delinquents share several characteristics. They tend to be relatively aggressive and violent fairly early in life, characteristics that lead to rejection by peers and academic failure. They are also more likely to have been diagnosed with attention deficit disorder as children, and they tend to be less intelligent than average (Silverthorn & Frick, 1999; Rutter, 2003).

Undersocialized delinquents often suffer from psychological difficulties, and as adults they fit a psychological pattern called antisocial personality disorder. They are relatively unlikely to be successfully rehabilitated, and many undersocialized delinquents live on the margins of society throughout their lives (Lynam, 1996; Frick et al., 2003).

Undersocialized delinquents are raised with little discipline or by harsh, uncaring parents, and they begin antisocial activities at a relatively early age. In contrast, socialized delinquents know and usually follow the norms of society, and they are highly influenced by their peers.

socialized delinquents
adolescent delinquents who know and subscribe to the norms of society and who are fairly normal psychologically

A larger group of adolescent offenders are socialized delinquents. **Socialized delinquents** know and subscribe to the norms of society; they are fairly normal psychologically. For them, transgressions committed during adolescence do not lead to a life of crime. Instead, most socialized delinquents pass through a period during adolescence when they engage in some petty crimes (such as shoplifting), but they do not continue lawbreaking into adulthood.

Typically, socialized delinquents are highly influenced by their peers, and their delinquency often occurs in groups. In addition, some research suggests that parents of socialized delinquents supervise their children's behavior less closely than other parents. But like other aspects of adolescent behavior, these minor delinquencies are often a result of giving in to group pressure or seeking to establish one's identity as an adult (Fletcher et al., 1995; Thornberry & Krohn, 1997).

Module 12.2 Review

- The search for autonomy may cause a readjustment in relations between teenagers and their parents, but the generation gap is less wide than is generally thought.
- Cliques and crowds serve as reference groups in adolescence and offer a ready means of social comparison. Sex cleavage gradually diminishes, until boys and girls begin to pair off. Racial separation increases during adolescence, bolstered by socioeconomic status differences, different academic experiences, and mutually distrustful attitudes.
- Degrees of popularity in adolescence include popular, controversial, neglected, and rejected adolescents.

Adolescents tend to conform to their peers in areas in which they regard their peers as experts, and to adults in areas of perceived adult expertise. Adolescents are disproportionately involved in criminal activities, although most do not commit crimes. Juvenile delinquents can be categorized as undersocialized or socialized delinquents.

Journal Writing Prompt

Applying Lifespan Development: Thinking back to your own high school days, what was the dominant clique in your school, and what factors were related to group membership?

Dating, Sexual Behavior, and Teenage Pregnancy

It took him almost a month, but Sylvester Chiu finally got up the courage to ask Jackie Durbin to go to the movies. It was hardly a surprise to Jackie, though. Sylvester had first told his friend Erik about his resolve to ask Jackie out, and Erik had told Jackie's friend Cynthia about Sylvester's plans. Cynthia, in turn, had told Jackie, who was primed to say "yes" when Sylvester finally did call.

Welcome to the complex world of dating, an important and changing ritual of adolescence. We'll consider dating, as well as several other aspects of adolescents' relationships with one another, in the remainder of the chapter.

Dating and Sexual Relationships in the Twenty-First Century

LO 12.10 Describe the functions and characteristics of dating during adolescence and how sexuality develops.

When and how adolescents begin to date is determined by cultural factors that change from one generation to another. Until fairly recently, exclusively dating a single individual was seen as something of a cultural ideal, viewed in the context of romance. Society often encouraged dating in adolescence, in part as a way for adolescents to explore relationships that might eventually lead to marriage. Today, some adolescents believe that the concept of dating is outmoded and limiting, and in some places the

practice of "hooking up"—a vague term that covers everything from kissing to sexual intercourse—is viewed as more appropriate. Despite changing cultural norms, dating remains the dominant form of social interaction that leads to intimacy among adolescents (Denizet-Lewis, 2004; Manning, Giordano, & Longmore, 2006; Bogle, 2008).

THE FUNCTIONS OF DATING. Although on the surface dating is part of a pattern of courtship that can potentially lead to marriage, it serves other functions as well, especially early on. Dating is a way to learn how to establish intimacy with another individual. It can provide entertainment and, depending on the status of the person one is dating, prestige. It even can be used to develop a sense of one's own identity (Zimmer-Gembeck & Gallaty, 2006; Friedlander, Connolly, Pepler & Craig, 2007; Paludi, 2012).

Just how well dating serves such functions, particularly the development of psychological intimacy, is an open question. What specialists in adolescence do know, however, is surprising: Dating in early and middle adolescence is not terribly successful at facilitating intimacy. On the contrary, dating is often a superficial activity in which the participants so rarely let down their guards that they never become truly close and never expose themselves emotionally to each other. Psychological intimacy may be lacking even when sexual activity is part of the relationship (Collins, 2003; Furman & Shaffer, 2003; Tuggle, Kerpelman, & Pittman, 2014).

True intimacy becomes more common during later adolescence. At that point, the dating relationship may be taken more seriously by both participants, and it may be seen as a way to select a mate and as a potential prelude to marriage (an institution we consider in Chapter 14).

For homosexual adolescents, dating presents special challenges. In some cases, blatant homophobic prejudice expressed by classmates may lead gays and lesbians to date members of the other sex in efforts to fit in. If they do seek relationships with other gays and lesbians, they may find it difficult to find partners, who may not openly express their sexual orientation. Homosexual couples who do openly date face possible harassment, making the development of a relationship all the more difficult (Savin-Williams, 2003a).

DATING, RACE, AND ETHNICITY. Culture influences dating patterns among adolescents of different racial and ethnic groups, particularly those whose parents have immigrated to the United States from other countries. Parents may try to control their children's dating behavior in an effort to preserve their culture's traditional values or ensure that their child dates within his or her racial or ethnic group.

For example, Asian parents may be especially conservative in their attitudes and values, in part because they themselves may have had no experience of dating. (In many cases, the parents' marriage was arranged by others, and the entire concept of dating is unfamiliar.) They may insist that dating be conducted with chaperones, or not at all. As a consequence, they may find themselves involved in substantial conflict with their children (Hamon & Ingoldsby, 2003; Hoelter, Axinn, & Ghimire, 2004; Lau et al., 2009).

SEXUAL BEHAVIOR. The hormonal changes of puberty not only trigger the maturation of the sexual organs but also produce a new range of feelings in the form of sexuality. Sexual behavior and thoughts are among the central concerns of adolescents. Almost all adolescents think about sex, and many think about it a good deal of the time (Kelly, 2001; Ponton, 2001).

The first type of sex in which adolescents engage is often solitary sexual self-stimulation, or **masturbation**. By the age of 15, some 80 percent of teenage boys and 20 percent of teenage girls report that they have masturbated. Masturbation in males occurs more frequently in the early teens and then begins to decline, while in females, the frequency is lower initially and increases throughout adolescence. In addition, patterns of masturbation frequency show differences according to race. For example, African American men and women masturbate less than whites (Schwartz, 1999; Hyde & DeLamater, 2004).

masturbation
sexual self-stimulation

Although masturbation is widespread, it still may produce feelings of shame and guilt. There are several reasons for this. One is that adolescents may believe that masturbation signifies the inability to find a sexual partner—an erroneous assumption, since statistics show that three-quarters of married men and two-thirds of married women report masturbating between 10 and 24 times a year (Das, 2007; Gerressu et al., 2008).

For some, the sense of shame about masturbation is the result of a lingering legacy of misguided views of masturbation. For instance, nineteenth-century physicians and laypersons warned of the horrible effects of masturbation, including "dyspepsia, spinal disease, headache, epilepsy, various kinds of fits . . . impaired eyesight, palpitation of the heart, pain in the side and bleeding at the lungs, spasm of the heart, and sometimes sudden death" (Gregory, 1856). Suggested remedies included bandaging the genitals, covering them with a cage, tying the hands, male circumcision without anesthesia (so that it might better be remembered), and for girls, the administration of carbolic acid to the clitoris. One physician, J. W. Kellogg, believed that certain grains would be less likely to provoke sexual excitation—leading to his invention of corn flakes (Michael et al., 1994).

The reality of masturbation is different. Today, experts on sexual behavior view it as a normal, healthy, and harmless activity. Some even suggest that it provides a useful way to learn about one's own sexuality (Hyde & DeLamater, 2004; Levin, 2007).

SEXUAL INTERCOURSE. Although it may be preceded by many different types of sexual intimacy, including deep kissing, massaging, petting, and oral sex, sexual intercourse remains a major milestone in the perceptions of most adolescents. Consequently, the main focus of researchers investigating sexual behavior has been on the act of heterosexual intercourse.

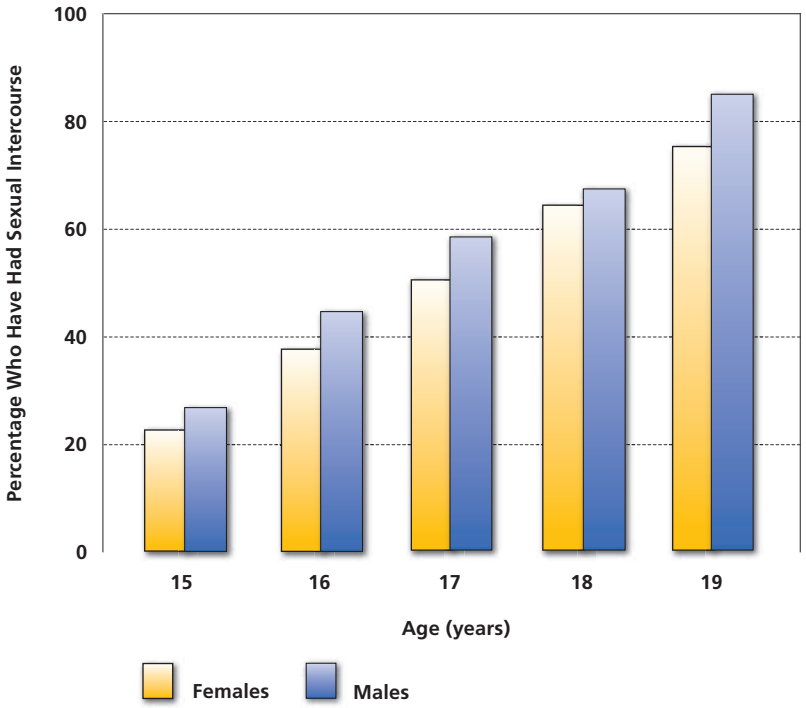
The average age at which adolescents first have sexual intercourse has been steadily declining over the last 50 years, and about 13 percent of adolescents have had sex before the age of 15. Overall, the average age of first sexual intercourse is 17, and around 80 percent of adolescents have had sex before the age of 20 (see Figure 12-8). At the same time, though, many teenagers are postponing sex, and the number of adolescents who say they have never had sexual intercourse increased by 13 percent from 1991 to 2007 (MMWR, 2008; Guttmacher Institute, 2012).

There are also racial and ethnic differences in the timing of initial sexual intercourse: African Americans generally have sex for the first time earlier than do Puerto Ricans, who have sex earlier than do whites. These racial and ethnic differences likely reflect differences in socioeconomic conditions, cultural values, and family structure (Singh & Darroch, 2000; Hyde, 2008).

Figure 12-8 Adolescents and Sexual Activity

The age at which adolescents have sexual intercourse for the first time is declining, and around three-quarters have had sex before the age of 20.

(**Source:** Morbidity and Mortality Weekly Report, 2008.)



From the viewpoint of *a medical care* provider

A parent asks you how to prevent her 14-year-old son from engaging in sexual activity until he is older. What would you tell her?

It is impossible to consider sexual activities without also looking at the societal norms governing sexual conduct. The prevailing norm several decades ago was the *double standard* in which premarital sex was considered permissible for males but not for females. Women were told by society that "nice girls don't," while men heard that premarital sex was permissible—although they should be sure to marry virgins.

Today the double standard has begun to give way to a new norm, called *permissiveness with affection.* According to this standard, premarital intercourse is viewed as permissible for both men and women if it occurs in the context of a long-term, committed, or loving relationship (Hyde & DeLamater, 2004; Earle et al., 2007).

The demise of the double standard is far from complete, however. Attitudes toward sexual conduct are still typically more lenient for males than for females, even in relatively socially liberal cultures. And in some cultures, the standards for men and women are quite distinct. For example, in North Africa, the Middle East, and the majority of Asian countries, most women conform to societal norms suggesting that they abstain from sexual intercourse until they are married. In Mexico, where there are strict standards against premarital sex, males are also considerably more likely than females to have premarital sex. In contrast, in sub-Saharan Africa, women are more likely to have sexual intercourse prior to marriage, and intercourse is common among unmarried teenage women (Johnson et al., 1992; Peltzer & Pengpid, 2006; Wellings et al., 2006; Ghule, Balaiah, & Joshi, 2007).

Sexual Orientation: Heterosexuality, Homosexuality, Bisexuality, and Transexualism

LO 12.11 Explain how sexual orientation develops in adolescence.

When we consider adolescents' sexual development, the most frequent pattern is *heterosexuality*, sexual attraction and behavior directed to the other sex. Yet some teenagers are *homosexual*, in which their sexual attraction and behavior is oriented to members of their own sex. (Most male homosexuals prefer the term *gay* and female homosexuals the label *lesbian*, because they refer to a broader array of attitudes and lifestyles than the term *homosexual*, which focuses on the sexual act.) Other people find they are *bisexual*, sexually attracted to people of both sexes.

Many teens experiment with homosexuality. At one time or another, around 20 percent to 25 percent of adolescent boys and 10 percent of adolescent girls have at least one same-sex sexual encounter. In fact, homosexuality and heterosexuality are not completely distinct sexual orientations. Alfred Kinsey, a pioneer sex researcher, argued that sexual orientation should be viewed as a continuum in which "exclusively homosexual" is at one end and "exclusively heterosexual" at the other (Kinsey, Pomeroy, & Martin, 1948). In between are people who show both homosexual and heterosexual behavior. Although accurate figures are difficult to obtain, most experts believe that between 4 and 10 percent of both men and women are exclusively homosexual during extended periods of their lives (Diamond, 2003a, 2003b; Russell & Consolacion, 2003; Pearson & Wilkinson, 2013).

The determination of sexual orientation is further complicated by distinctions between sexual orientation and gender identity. While sexual orientation relates to the object of one's sexual interests, *gender identity* is the gender a person believes he or she is psychologically. Sexual orientation and gender identity are not necessarily related to one another: A man who has a strong masculine gender identity may be attracted to other men. Consequently, the extent to which men and women enact traditional "masculine" or "feminine" behavior is not necessarily related to their sexual orientation or gender identity (Hunter & Mallon, 2000).

Some individuals identify as transsexuals. *Transexuals* feel that they are trapped in the body of the other gender. Transexualism represents a gender issue involving one's sexual identity. Transexuals may seek sex-change operations in which their genitals are surgically removed and the genitals of the desired sex are created. It is a difficult path, one involving counseling, hormone injections, and living as a member of the desired sex for several years prior to surgery. Ultimately, though, the outcome can be very positive.

Transexuals are different from individuals who are called *intersex* or the older term *hermaphrodite.* An intersex person is born with an atypical combination of sexual organs or chromosomal or gene patterns. For instance, they may be born with both male and fe-

WATCH THIS VIDEO ON MYPSYCHLAB THINKING LIKE A PSYCHOLOGIST: SEXUAL ORIENTATION

male sex organs, or ambiguous organs. Only one in 4,500 births are intersex infants (Diamond, 2013).

WHAT DETERMINES SEXUAL ORIENTATION? The factors that induce people to develop as heterosexual, homosexual, or bisexual are not well understood. Evidence suggests that genetic and biological factors may play an important role. Studies of twins show that identical twins are more likely to both be homosexual than pairs of siblings who don't share their genetic makeup. Other research finds that various structures of the brain are different in homosexuals and heterosexuals, and hormone production also seems to be linked to sexual orientation (Ellis et al., 2008; Fitzgerald, 2008; Santilla et al., 2008).

Other researchers have suggested that family or peer environmental factors play a role. For example, Freud argued that homosexuality was the result of inappropriate identification with the opposite-sex parent (Freud, 1922/1959). The difficulty with Freud's theoretical perspective and other, similar perspectives that followed is that there simply is no evidence to suggest that any particular family dynamic or childrearing practice is consistently related to sexual orientation. Similarly, explanations based on learning theory, which suggest that homosexuality arises because of rewarding, pleasant homosexual experiences and unsatisfying heterosexual ones, do not appear to be the complete answer (Isay, 1990; Golombok & Tasker, 1996).

In short, there is no accepted explanation of why some adolescents develop a heterosexual orientation and others a homosexual orientation. Most experts believe that sexual orientation develops out of a complex interplay of genetic, physiological, and environmental factors (LeVay & Valente, 2003; Mustanski, Kuper, & Greene, 2014).

What is clear is that adolescents who find themselves attracted to members of the same sex may face a more difficult time than other teens. U.S. society still harbors great ignorance and prejudice regarding homosexuality, persisting in the belief that people have a choice in the matter—which they do not. Gay and lesbian teens may be rejected by their family or peers, or even harassed and assaulted if they are open about their orientation. The result is that adolescents who find themselves to be homosexual are at greater risk for depression, and suicide rates are significantly higher for homosexual adolescents than for heterosexual adolescents. Gays and lesbians who do not conform to gender stereotypes are particularly susceptible to victimization, and they have lower rates of adjustment (Toomey et al., 2010; Madsen & Green, 2012; Mitchell, Ybarra, & Korchmaros, 2014).

On the other hand, most people ultimately come to grips with their sexual orientation and become comfortable with it. Although lesbian, gay, and bisexuals may experience mental health difficulties as a result of the stress, prejudice, and discrimination they face, homosexuality is not considered a psychological disorder by any major psychological or medical association. All of them endorse efforts to reduce discrimination against homosexuals. Furthermore, society's attitudes toward homosexuality are changing, particularly among younger individuals. For example, a majority of U.S. citizens favor the legalization of gay marriage, which became legal in 2015 (Russell & McGuire, 2006; Baker & Sussman, 2012; Patterson, 2013).

Teenage Pregnancies

LO 12.12 Summarize the challenges of teen pregnancy and the types of programs that are most effective in preventing it.

Night has eased into day, but it is all the same for Tori Michel, 17. Her 5-day-old baby, Caitlin, has been fussing for hours, though she seems finally to have settled into the pink-and-purple car seat on the living-room sofa. "She wore herself out," explains Tori, who lives in a two-bedroom duplex in this St. Louis suburb with her mother, Susan, an aide to handicapped adults. "I think she just had gas."

Motherhood was not in Tori's plans for her senior year at Fort Zumwalt South High School—not until she had a "one-night thing" with James, a 21-year-old she met through friends. She had been taking birth-control pills but says she stopped after breaking up with

a long-term boyfriend. "Wrong answer," she now says ruefully. (Gleick, Reed, & Schindehette, 1994, p. 38)

WATCH THIS VIDEO ON MYPSYCHLAB SEXUALITY
IN ADOLESCENCE: PREGNANT TEEN

Feedings at 3:00 a.m., diaper changes, and visits to the pediatrician are not part of most people's vision of adolescence. Yet, every year, tens of thousands of adolescents in the United States give birth.

The good news, though, is that the number of teenage pregnancies has decreased significantly in the last two decades. In fact, in 2012, the birth rate for U.S. teenagers was the lowest level ever reported in the seven decades that the government has been tracking pregnancies (see Figure 12-9). Birth rates declined to historic lows in all racial and ethnic groups, but disparities remain, with the rate of teenage births higher for non-Hispanic blacks and Hispanics than for whites. Overall, the pregnancy rate of teenagers is 34.3 births per 1,000 (Colen, Geronimus, & Phipps, 2006; Hamilton et al., 2009; Hamilton & Ventura, 2012).

Several factors explain the drop in teenage pregnancies:

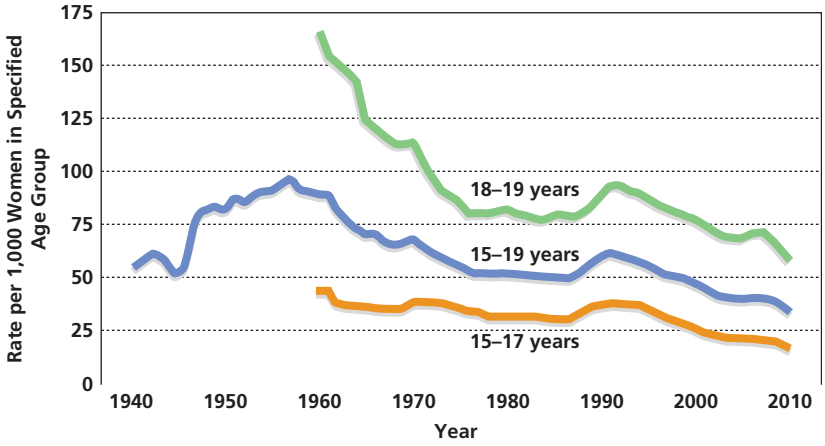
- New initiatives have raised awareness among teenagers of the risks of unprotected sex. For example, about two-thirds of high schools in the United States have established comprehensive sex education programs (Villarosa, 2003; Corcoran & Pillai, 2007).
- The rates of sexual intercourse among teenagers have declined. The percent of teenage girls who have ever had sexual intercourse dropped from 51 percent in 1988 to 43 percent in 2006–2010 (Martinez, Copen, & Abma, 2011).
- The use of condoms and other forms of contraception has increased. For example, virtually all sexually experienced girls aged 15–19 have used some method of contraception (Martinez, Copen, & Abma, 2011).
- Substitutes for sexual intercourse may be more prevalent. For example, oral sex, which many teenagers do not even consider "sex," may increasingly be viewed as an alternative to sexual intercourse (Bernstein, 2004; Chandra, Mosher, & Copen, 2011).

One thing that apparently hasn't led to a reduction in teenage pregnancies is asking adolescents to take a virginity pledge. Public pledges to refrain from premarital sex—a centerpiece of some forms of sex education—apparently are ineffective. For example, in one study of 12,000 teenagers, 88 percent reported eventually having sexual intercourse. However, pledges did delay the start of sex an average of 18 months (Bearman & Bruckner, 2004).

Even with the decline in the birthrate for U.S. teenagers, the rate of teenage pregnancy in the United States is 2 to 10 times higher than that of other industrialized countries. The results of an unintended pregnancy can be devastating to both mother and child. In comparison to earlier times, teenage mothers today are much less likely to be married. In a high percentage of cases, mothers care for their children without the help of the father. Without financial or emotional support, a mother may have to abandon her own education, and consequently she may be relegated to unskilled, poorly paying jobs for the rest of her life. In other cases, she may develop long-term dependency on welfare. An adolescent mother's physical and mental health may suffer as she faces unrelenting stress due to continual demands on her time (Manlove et al., 2004; Gillmore et al., 2006; Oxford et al., 2006).

Figure 12-9 Teenage Pregnancy Rates

Although there has been a small increase in recent years, the rate of teenage pregnancies has dropped dramatically among all ethnic groups since 1991.
(**Source:** Hamilton & Ventura, 2012.)



Module 12.3 Review

- Dating in adolescence serves a number of functions including intimacy, entertainment, and prestige. Masturbation, once viewed very negatively, is now generally regarded as a normal and harmless practice that continues into adulthood. Sexual intercourse is a major milestone that most people reach during adolescence. The age of first intercourse reflects cultural differences and has been declining over the last 50 years.
- Sexual orientation, which is most accurately viewed as a continuum rather than categorically, develops as the result of a complex combination of factors.
- Teenage pregnancy has negative consequences for adolescent mothers and their children. The incidence of teenage pregnancies has declined because awareness among adolescents has increased, as have the use of condoms and reliance on substitutes for intercourse.

Journal Writing Prompt

Applying Lifespan Development: What aspects of the social world of adolescents work against the achievement of true intimacy in dating?

Epilogue

We continued our consideration of adolescence in this chapter, looking at social and personality issues. Self-concept, self-esteem, and identity develop during adolescence, and it can be a period of self-discovery. We looked at adolescents' relationships with family and peers, and at gender, race, and ethnic relations during adolescence. Our discussion concluded with a look at dating, sexuality, and sexual orientation.

Before we move to the next chapter, recall the prologue about Livia Abello and the confusion she was experiencing over her identity. Consider the following questions.

1. What gender pressures does Livia face? How might her experience be different if she were a boy?
2. What do you think Livia's self-esteem has been based on in adolescence? How do you see this changing in her current assessment of her life?
3. Livia seems to be experiencing identity confusion. What risks does she face if she cannot resolve the question of who she is?
1. Livia has always made certain she is part of a clique. What price do you think she has paid for her need to belong?

Looking Back

LO 12.1 Describe how self-concept and self-esteem develop during adolescence.

During adolescence, self-concept differentiates to encompass others' views as well as one's own and to include multiple aspects simultaneously. Differentiation of self-concept can cause confusion as behaviors reflect a complex definition of the self. Adolescents also differentiate their self-esteem, evaluating particular aspects of themselves differently.

LO 12.2 Summarize how Erikson explains identity formation during adolescence.

According to Erik Erikson, adolescents are in the identity-versus-identity-confusion stage, seeking to discover their individuality and identity. They may become confused and exhibit dysfunctional reactions, and they may rely for help and information more on friends and peers than on adults.

LO 12.3 Explain Marcia's categories of adolescent identity.

James Marcia identifies four identity statuses that individuals may experience in adolescence and in later life: identity achievement, identity foreclosure, identity diffusion, and moratorium.

LO 12.4 Describe the role religion and spirituality play in identity formation in adolescence.

Many adolescents begin to think abstractly and critically about religion and spirituality and come to form their own religious identity.

LO 12.5 Discuss the challenges ethnic and minority groups face in identity formation in adolescence.

The formation of an identity is challenging for members of racial and ethnic minority groups, many of whom appear to be embracing a bicultural identity approach.

LO 12.6 Identify the dangers adolescents face as they deal with the stresses of their age.

Many adolescents have feelings of sadness and hopelessness, and some experience major depression. Biological, environmental, and social factors contribute to depression,

and there are gender, ethnic, and racial differences in its occurrence. The rate of adolescent suicide is rising, with suicide now the third most common cause of death in the 15- to 24-year-old bracket.

LO 12.7 Describe what family relationships are like during adolescence.

Adolescents' quest for autonomy often brings confusion and tension to their relationships with their parents, but the actual "generation gap" between parents' and teenagers' attitudes is usually small.

LO 12.8 Explain how relationships with peers change during adolescence.

Peers are important during adolescence because they provide social comparison and reference groups against which to judge social success. Relationships among adolescents are characterized by the need to belong. During adolescence, boys and girls begin to spend time together in groups and, toward the end of adolescence, to pair off. In general, segregation between people of different races and ethnicities increases in middle and late adolescence, even in schools with a diverse student body.

LO 12.9 Discuss what it means to be popular and unpopular in adolescence and how adolescents respond to peer pressure.

Degrees of popularity during adolescence include popular and controversial adolescents (on the high end of popularity) and neglected and rejected adolescents (on the low end). Peer pressure is not a simple phenomenon. Adolescents conform to their peers in areas in which they feel their peers are expert, and to adults in areas of adult expertise. As adolescents grow in confidence, their conformity to both peers and adults declines. Although most adolescents do not commit crimes, adolescents are disproportionately involved in criminal activities. Juvenile delinquents can be categorized as undersocialized or socialized delinquents.

LO 12.10 Describe the functions and characteristics of dating during adolescence and how sexuality develops.

During adolescence, dating provides intimacy, entertainment, and prestige. Achieving psychological intimacy, which is difficult at first, becomes easier as adolescents mature, gain confidence, and take relationships more seriously. For most adolescents, masturbation is often the first step into sexuality. The age of first intercourse, which is now in the teens, has declined as the double standard has faded and the norm of permissiveness with affection has gained ground. However, the rate of sexual intercourse has declined.

LO 12.11 Explain how sexual orientation develops in adolescence.

Sexual orientation develops out of a complex interplay of genetic, physiological, and environmental factors.

LO 12.12 Summarize the challenges of teen pregnancy and the types of programs that are most effective in preventing it.

Teenage pregnancy has been declining in the United States for two decades, but it remains a problem because of its serious and long-term consequences for both mother and child. The most effective means for preventing teen pregnancy is the provision of accurate information, the availability of condoms and other forms of pregnancy avoidance, and the practice of alternative forms of sexuality.

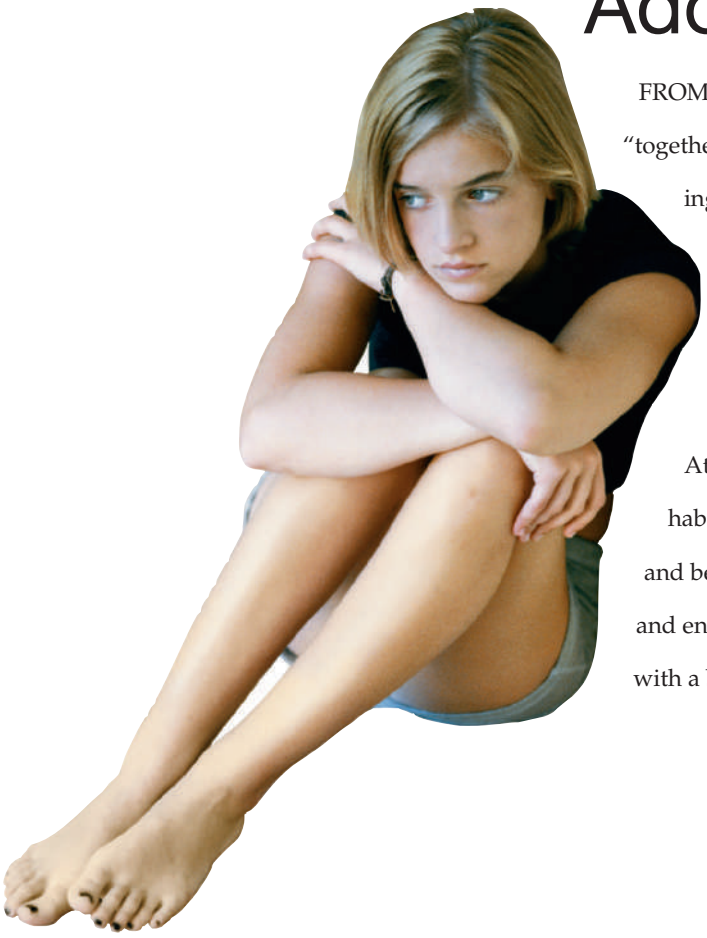
Key Terms and Concepts

identity-versus-identity-confusion stage 412
identity achievement 414
identity foreclosure 414
moratorium 415
identity diffusion 415
autonomy 422
generation gap 424
reference groups 426
cliques 427
crowds 427
sex cleavage 427
controversial adolescents 429
rejected adolescents 429
neglected adolescents 429
peer pressure 430
undersocialized delinquents 431
socialized delinquents 432
masturbation 433

SUMMARY

5 Putting It All Together

Adolescence



FROM AGE 13 TO AGE 18, Mariah, changed from a seemingly "together" teenager to a troubled young adolescent to an increasingly confident and independent late adolescent. Early in her adolescence, she struggled to define herself and responded to the "Who am I?" question with some decidedly unwise answers. She dabbled with—and then nearly drowned in—drugs, and she attempted suicide. At last, seeking help for her difficulties, she kicked her bad habits, began to work on her self-concept, returned to school and became interested in photography, repaired her family life, and entered a positive relationship with a boyfriend.

WHAT WOULD YOU DO?

■ If you were a friend of Mariah's, what advice and support would you give her before she attempted suicide? What advice and support would you provide during her recovery?

What's your response?

WHAT WOULD A PARENT DO?

■ What warning signs should Mariah's parents have seen as their daughter descended into depression and attempted suicide? Is there anything they should have done?

What's your response?

Physical Development

- Adolescents have many physical issues to deal with.
- Mariah's resort to drugs is a strategy used by some adolescents for coping with the stresses of the period.
- Adolescent brain development permits Mariah to engage in complex thinking, which can sometimes lead to confusion.
- Mariah displays a lack of impulse control, which is typical of a not-yet fully developed prefrontal cortex.

Cognitive Development

- Adolescents' personal fables include a sense of invulnerability, which probably contributed to Mariah's impulsive decisions.
- Mariah's depression may stem from the adolescent tendency toward introspection and self-consciousness.
- Mariah may use drugs to escape the pressures of everyday life.
- It is not unusual for an adolescent like Mariah to have school difficulties.

Social and Personality Development

- Mariah's struggles with identity represent the characteristic internal conflict of adolescence.
- In balancing friendships with the desire to be alone, Mariah is struggling to accommodate her increasingly complex personality.
- Her more accurate self-concept may in fact lower Mariah's self-esteem.
- In relying on her "cool" crowd, Mariah is defining her identity in terms of a questionable reference group.
- Mariah's struggle with depression reflects the higher incidence of this ailment among adolescent girls.
- Mariah benefited from a moratorium that enabled her to reestablish connection with her "clueless" parents and begin to assume true independence.
- Her relationship with her boyfriend indicates a return to a normal social pattern.

WHAT WOULD A SOCIAL WORKER DO?

When an adolescent such as Mariah shows a definite decline in academic performance, are the symptoms likely to be interpreted differently depending on whether the adolescent comes from an affluent or impoverished background? How can a professional care provider prevent different interpretation and treatment?

What's your response?

WHAT WOULD AN EDUCATOR DO?

What signals might a teacher have observed in Mariah's classroom performance to suggest that she was having a drug problem? What steps might the teacher have taken?

What's your response?

Chapter 13

Physical and Cognitive Development in Early Adulthood

Learning Objectives

LO 13.1 Describe how the body develops and stays healthy during early adulthood.

LO 13.2 Explain why a healthy diet is particularly important in early adulthood.

LO 13.3 Describe the challenges people with physical disabilities face in early adulthood.

LO 13.4 Summarize the effects of stress and what can be done about it.

LO 13.5 Describe how cognitive development continues in young adulthood.

LO 13.6 Compare and contrast Perry's and Schaie's approaches to cognitive development in young adulthood.

LO 13.7 Explain how intelligence is defined today and how life events cause cognitive growth in young adults.

LO 13.8 Describe who attends college today and how the college population is changing.

LO 13.9 Summarize the difficulties students face as they enter college.

LO 13.10 Describe how gender effects the treatment of college students.

LO 13.11 Summarize why students drop out of college.

Chapter Overview

Prologue: Foreclosing on Her Dreams

Kaneesha Davis graduated near the top of her class with a degree in economics. Her dream was to find work helping poor and struggling middle-class people achieve *their* dreams—starting a business, buying a home, earning a college degree. But Kaneesha graduated with $70,000 of debt in a tight job market. She felt forced to take the one job she was offered, in the loan department of a Chicago bank. "I think they hired me because they could tick off two boxes on their 'diversity' chart: Black and female," Kaneesha says. "It certainly wasn't because we share goals." Now, she spends her days assisting in home foreclosures. "My boss has executed more foreclosures than anyone else in our department. He's proud of it, but I feel sick," she says. "Every day, I am paid to do damage to the people who can least afford it."

Yesterday, her boss foreclosed on a single mother with three small children. "The woman was weeping," Kaneesha says. "She kept saying, 'You're a woman. You understand, don't you?' I felt like a monster." Distracted, Kaneesha ran a red light on the way home and nearly crashed head-on into a truck. Only her quick reaction time saved her life. Though Kaneesha walked away with only a broken wrist, her car was totaled, and she was badly shaken. "I don't know what I'm doing with my life," she says. ■

Looking Ahead

Kaneesha's difficulty in finding a job that matches her talents and her dreams is not at all unusual for young people today. People in early adulthood are at the height of their physical and cognitive abilities, but they also can experience tremendous stress as they launch themselves into the adult world.

As we see in this and the following chapter, considerable development goes on during early adulthood, which starts at the end of adolescence (around age 20) and continues until roughly the start of middle age (around age 40). Significant changes—and challenges—occur as new opportunities arise and people choose to take on (or to forgo) a new set of roles as spouse, parent, and worker.

This chapter focuses on physical and cognitive development during this period. It begins with a look at the physical changes that extend into early adulthood. Though more subtle than the physical changes of adolescence, growth continues and various

Graduating from college is a significant milestone for some young adults.

motor skills change as well. We look at diet and weight, examining the prevalence of obesity in this age group. We also consider stress and coping during the early years of adulthood.

The chapter then turns to cognitive development. Although traditional approaches to cognitive development regarded adulthood as an inconsequential plateau, we will examine some new theories suggesting that significant cognitive growth occurs during adulthood. We also consider the nature of adult intelligence and the impact of life events on cognitive development.

The last part of the chapter focuses on college, the institution that shapes intellectual growth for those who attend. We examine who goes to college, and we explore how gender and race can influence achievement. We end by looking at some reasons why students drop out of college and discussing some of the adjustment problems that college students face.

Physical Development

Grady McKinnon grinned as his mountain bike left the ground briefly. The 27-year-old financial auditor was delighted to be out for a camping and biking weekend with four of his college buddies. Grady had been worried that an upcoming deadline at work would make him miss this trip. When they were still in school, Grady and his friends used to go biking nearly every weekend. But jobs, marriage—and even a child for one of the guys—started taking up a lot of their attention. This was their only trip this summer. He was glad he hadn't missed it.

Grady and his friends were probably in the best physical condition of their lives when they first started to go mountain biking regularly in college. Even now, as Grady's life becomes more complicated and sports start to take a backseat to work and other personal demands, he is still enjoying one of the healthiest periods of his life. As we will see, although most people, like Grady, reach the height of their physical capacities in young adulthood, at the same time, they must try to cope with the stress produced by the challenges of their adult lives.

Physical Development, Fitness, and Health

LO 13.1 Describe how the body develops and stays healthy during early adulthood.

In most respects, physical development and maturation are complete at early adulthood. Most people are at the peak of their physical capabilities. They have attained their full height, and their limbs are proportional to their size, rendering the gangliness of adolescence a memory. People in their early 20s tend to be healthy, vigorous, and energetic. Although **senescence**, the natural physical decline brought about by increasing age, has already begun, age-related changes are not usually very obvious to people until later in their lives.

senescence
the natural physical decline brought about by aging

At the same time, some growth continues during early adulthood. For example, some people, particularly late maturers, continue to gain height in their early 20s.

Certain parts of the body also reach full maturity now. For example, the brain grows in both size and weight, reaching its maximum during early adulthood (and then subsequently contracting in size later in life). The gray matter of the brain continues to

be pruned back, and myelination (the process in which nerve cells are insulated by a covering of fat cells) continues to increase. These changes in the brain help support the cognitive advances that occur during early adulthood (Sowell et al., 2001; Toga, Thompson, & Sowell, 2006; Li, 2012; Schwarz & Bilbo, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB YOUNG ADULTHOOD: HEALTH, MAK

THE SENSES. In early adulthood, the senses are as sharp as they will ever be. Although there are changes in the elasticity of the eye—a continuation of an aging process that may begin as early as age 10—they are so minor that they produce no deterioration in vision. It is not until the 40s that eyesight changes sufficiently to be noticeable—as we will see in Chapter 15.

Hearing, too, is at its peak. However, a gender difference emerges: Women can detect higher tones more readily than men (McGuinness, 1972). In general, though, the hearing of both men and women is quite good. Under quiet conditions, the average young adult can hear the ticking of a watch 20 feet away.

The other senses, including taste, smell, and sensitivity to touch and pain, are quite good, and they remain that way throughout early adulthood. These senses do not begin to deteriorate until the 40s or 50s.

PHYSICAL FITNESS. If you are a professional athlete, most people probably consider you to be over the hill by the time you leave your 20s. Although there are notable exceptions (think of baseball star Ted Williams, who continued playing baseball into his 40s), even athletes who train constantly tend to lose their physical edge once they reach their 30s. In some sports, the peak passes even sooner. Swimmers are at their best in their late teens, and gymnasts peak even earlier.

The rest of us are also at the height of our psychomotor abilities during early adulthood. Reaction time is quicker, muscle strength is greater, and eye–hand coordination is better than at any other period (Sliwinski et al., 1994).

The physical prowess that typically characterizes early adulthood doesn't come naturally, however; nor does it come to everyone. In order to reach their physical potential, people must exercise and maintain a proper diet.

The benefits of exercise are hardly secret: In the United States, yoga and aerobics classes, Nautilus workouts, and jogging and swimming are seemingly common activities. Yet the conspicuousness of exercise activities is misleading. Less than 10 percent of Americans are involved in sufficient regular exercise to keep them in good physical shape, and less than a quarter engage in even moderate regular exercise. Furthermore, the opportunity to exercise is largely an upper- and middle-class phenomenon; people of lower socioeconomic status (SES) often have neither the time nor the money to engage in regular exercise (Delva, O'Malley, & Johnston, 2006; Proper, Cerin, & Owen, 2006; Farrell et al., 2014).

The amount of exercise required to yield significant health benefits is not enormous. According to recommendations from the American College of Sports Medicine and the Centers for Disease Control and Prevention, people should accumulate at least 30 minutes of moderate physical activity at least five days a week. The time spent exercising can be continuous or occur in bouts of at least 10 minutes, as long as it totals 30 minutes each day. Moderate activity includes walking briskly at 3 to 4 mph, biking at speeds up to 10 mph, golfing while carrying or pulling clubs, fishing by casting from shore, playing ping pong, or canoeing at 2 to 4 mph. Even common household chores, such as weeding, vacuuming, and mowing with a power mower, provide moderate exercise (American College of Sports Medicine, 1997).

It's not just professional athletes who are at the height of athleticism in early adulthood. Almost everyone reaches their peak of physical fitness during this period.

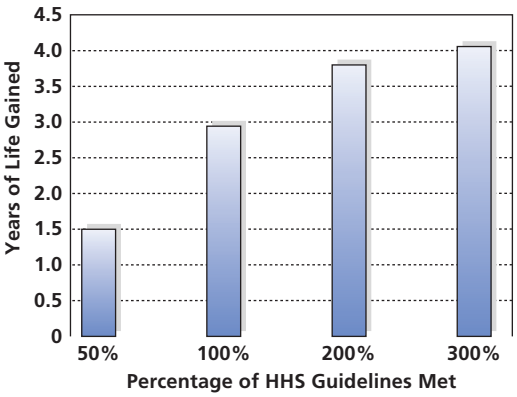
From *an educator's* perspective

Can people be taught the lifelong advantages of regular exercise? Should school-based physical education programs be changed to foster a lifelong commitment to exercise?

Figure 13-1 The Result of Fitness: Longevity

The greater the fitness level, as measured by adherence to the Health and Human Services (HHS) guidelines met, the higher the gains in life expectancy due to physical activity.

Source: http://www.nih.gov/news/health/nov2012/nci-06.htm. November 6, 2012, 5 p.m. NIH study finds leisure-time physical activity extends life expectancy as much as 4.5 years. National Cancer Institute Press Release 11/16/12.



The advantages to those who do become involved in regular exercise programs are many. Exercise increases cardiovascular fitness, meaning that the heart and circulatory system operate more efficiently. Furthermore, lung capacity increases, raising endurance. Muscles become stronger, and the body is more flexible and maneuverable. The range of movement is greater, and the muscles, tendons, and ligaments are more elastic. Moreover, exercise during this period helps reduce *osteoporosis*, the thinning of the bones, in later life.

Exercise also may optimize the immune response of the body, helping it fight off disease. Exercise may even decrease stress and anxiety and reduce depression. It can provide people with a sense of control over their bodies, as well as impart a feeling of accomplishment (Wise et al., 2006; Rethorst, Wipfli, & Landers, 2009; Treat-Jacobson, Bronäs & Salisbury, 2014).

Regular exercise offers the possibility of another, ultimately more important, reward: It is associated with increased longevity (see Figure 13-1; Stevens et al., 2002).

HEALTH. Although a lack of exercise may produce poor health (and worse), health risks in general are relatively slight during early adulthood. During this period, people are less susceptible to colds and other minor illnesses than they were as children, and when they do come down with illnesses, they usually get over them quickly.

Adults in their 20s and 30s stand a higher risk of dying from accidents, primarily those involving automobiles, than from most other causes. But there are other killers: Among the leading sources of death for people age 25 to 34 are AIDS, cancer, heart disease, and suicide. Amid the grim statistics of mortality, the age 35 represents a significant milestone. It is at that point that illness and disease overtake accidents as the leading cause of death—the first time this is true since infancy.

Not all people fare equally well during early adulthood. Lifestyle decisions, including the use—or abuse—of alcohol, tobacco, or drugs or engaging in unprotected sex, can hasten *secondary aging*, physical declines brought about by environmental factors or an individual's behavioral choices. Such lifestyle decisions can also increase a young adult's risk of dying from illness and disease.

As the definition of secondary aging implies, cultural factors, including gender and race, are also related to the risk of dying in young adulthood. For instance, men are more apt to die than women, primarily due to their higher involvement in automobile accidents. Furthermore, African Americans have twice the death rate of Caucasians, and minorities in general have a higher likelihood of dying than the Caucasian majority.

Another major cause of death for men in this age group is violence, particularly in the United States. The homicide rate is higher in the United States than in many other developed countries (see Figure 13-2). Racial factors are also related to the homicide rate in the United States.

Although homicide is the third most frequent cause of death for white males between the ages of 20 to 34, it is *the* most frequent cause of death for black males and the second most frequent cause of death for Hispanic males in that same age range.

Race and culture are related not only to the causes of death, but, as we see in the *Developmental Diversity and Your Life* feature, also to young adults' lifestyles and health-related behavior.

Eating, Nutrition, and Obesity: A Weighty Concern

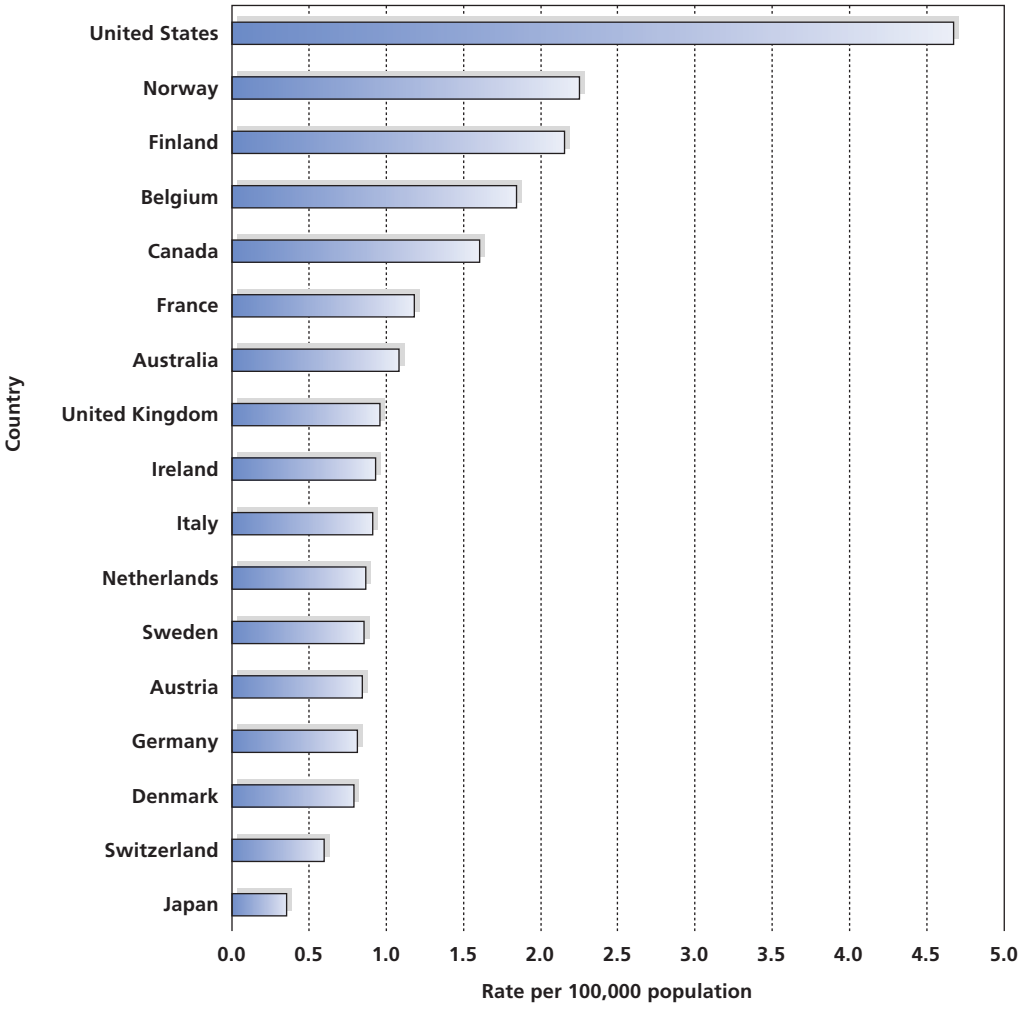
LO 13.2 Explain why a healthy diet is particularly important in early adulthood.

Most young adults know which foods are nutritionally sound and how to maintain a balanced diet; they just don't bother to follow the rules—even though the rules are not all that difficult to follow.

Figure 13-2 Tracking Murder

The murder rate is far higher in the United States than in many other developed countries. What features of U.S. society contribute to this state of affairs?

(**Source:** Based on UNODC, 2013.)



GOOD NUTRITION. According to guidelines provided by the U.S. Department of Agriculture, people can achieve good nutrition by eating foods that are low in fat, including vegetables, fruits, whole-grain foods, fish, poultry, lean meats, and low-fat dairy products. In addition, whole-grain foods and cereal products, vegetables (including dried beans and peas), and fruit are beneficial in another way: They help people raise the amount of complex carbohydrates and fiber they ingest. Milk and other sources of calcium are also needed to prevent osteoporosis. Finally, people should reduce salt intake (USDA, 2006; Jones et al., 2012; Tyler et al., 2014).

During adolescence, a poor diet does not always present a significant problem. For instance, teenagers don't suffer too much from a diet high in junk foods and fat because they are undergoing such tremendous growth. The story changes when they reach young adulthood, however. With growth tapering off, young adults must reduce the caloric intake they were used to during adolescence.

Many do not. Although most people enter young adulthood with bodies of average height and weight, they gradually put on weight if their poor dietary habits remain unchanged.

OBESITY. The adult population of the United States is growing—in more ways than one. Obesity, defined as body weight that is 20 percent or more above the average weight

Developmental Diversity and Your Life

How Cultural Beliefs Influence Health and Health Care

Manolita recently suffered a heart attack. She was advised by her doctor to change her eating and activity habits or face the risk of another life-threatening heart attack. During the period that followed, Manolita dramatically changed her eating and activity habits. She also began going to church and praying extensively. After a recent checkup, Manolita is in the best shape of her life. What are some of the reasons for Manolita's amazing recovery? (Murguia, Peterson, & Zea, 1997, 16)

***

After reading this passage, would you conclude that Manolita recovered her health because (a) she changed her eating and activity habits, (b) she became a better person, (c) God was testing her faith, or (d) her doctor prescribed the correct changes?

In response to a survey asking this question, more than two-thirds of Latino immigrants from Central America, South America, or the Caribbean believed that "God was testing her faith" had a moderate or great effect on her recovery, although most also agreed that a change in eating and activity habits was important (Murguia et al., 1997).

The findings of this study help explain why Latinos are the least likely of any Western ethnic group to seek the help of a physician when they are ill. According to psychologists Alejandro Murguia, Rolf Peterson, and Maria Zea (1997), cultural health beliefs, along with demographic and psychological barriers, reduce people's use of physicians and medical care.

Specifically, they suggest that Latinos, as well as members of some other non-Western groups, are more likely than non-Hispanic whites to believe in supernatural causes of illness. For instance, members of these groups may attribute illness to a punishment from God, a lack of faith, or a hex. Such beliefs may reduce the motivation to seek medical care from a physician (Landrine & Klonoff, 1994).

Money also plays a role. Lower socioeconomic status reduces the ability to pay for traditional medical care, which is expensive and may indirectly encourage the continued reliance on less traditional and less expensive methods. In addition, the lower level of involvement in the mainstream culture that is characteristic of recent immigrants to the United States is associated with a lower likelihood of visiting a physician and obtaining mainstream medical care (Pachter & Weller, 1993; Landrine & Klonoff, 1994; Antshel & Antshel, 2002).

Health-care providers need to take cultural beliefs into account when treating members of different cultural groups. For example, if a patient believes that the source of his or her illness is a spell cast by a jealous romantic rival, the patient may not comply with medical regimens that ignore that perceived source. To provide effective health care, then, health-care providers must be sensitive to such cultural health beliefs.

for a person of a given height, is on the rise in the United States. A third of adults are obese, a percentage that has nearly tripled since the 1960s. Furthermore, as age increases, more and more people are classified as obese (see Figure 13-3; Centers for Disease Control and Prevention, 2010).

Weight control is a difficult, and often losing, battle for many young adults. Most people who diet ultimately regain the weight they have lost, and they become involved in a seesaw cycle of weight gain and loss. Some obesity experts now argue that the rate of dieting failure is so great that people may want to avoid dieting altogether. Instead, if people eat the foods they really want in moderation, they may be able to avoid the binge eating that often occurs when diets fail. Even though obese people may never reach their desired weight, they may, according to this reasoning, ultimately control their weight more effectively (Annunziato & Lowe, 2007; Roehrig et al., 2009; Tremblay & Chaput, 2012).

Obesity is particularly prevalent in the United States. The world average weight for adults is 137 pounds; in the United States, the average is 180 (Walpole, 2012; see Figure 13-4).

Physical Disabilities: Coping with Physical Challenge

LO 13.3 Describe the challenges people with physical disabilities face in early adulthood.

Over 50 million people in the United States are physically or mentally challenged, according to the official definition of *disability*—a condition that substantially limits a

Figure 13-3 Obesity on the Rise

In spite of greater awareness of the importance of good nutrition, the percentage of adults with weight problems in the United States has risen dramatically over the past few decades. Why do you think this rise has occurred?

(**Source:** National Health and Nutrition Examination Survey, 2014.)

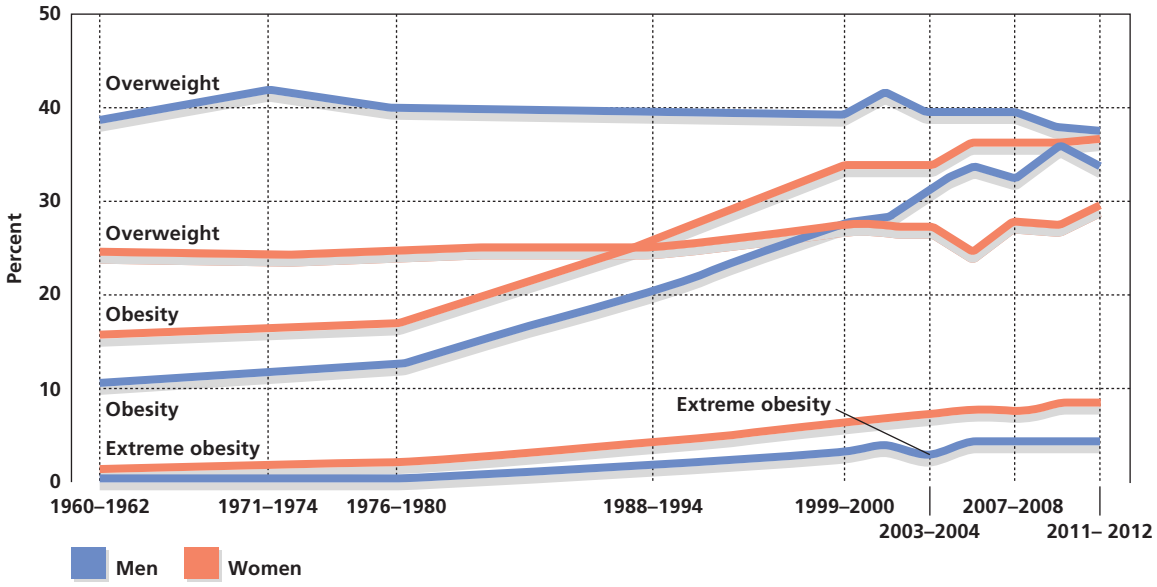
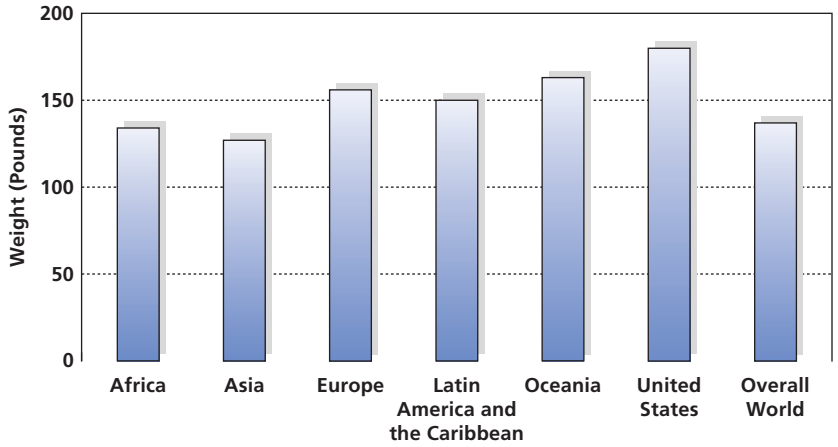


Figure 13-4 First in Obesity

Obesity is particularly prevalent in the United States. The world average weight for adults is 137 pounds; in the United States, the average is 180 (Walpole, 2012).



major life activity, such as walking or vision. People with disabilities face a difficult, challenging path.

Statistics on people with disabilities paint a picture of a minority group that is undereducated and underemployed. Fewer than 10 percent of those with major handicaps have finished high school, fewer than 25 percent of disabled men and 15 percent of disabled women work full time, and unemployment rates are high. Furthermore, even if people with disabilities do find work, the positions they find are often routine and low-paying (Albrecht, 2005).

Individuals with disabilities face several kinds of barriers to leading full lives that are completely integrated into the broader society. Some barriers are physical. Despite

Despite the passage of the Americans with Disabilities Act (ADA), people with physical disabilities still cannot gain access to many older buildings.

passage in 1990 of the landmark Americans with Disabilities Act (ADA), which mandates full access to public establishments such as stores, office buildings, hotels, and theaters, people in wheelchairs still cannot gain access to many older buildings.

From *a social worker's* perspective

What sorts of interpersonal barriers do people with disabilities face? How can those barriers be removed?

Another barrier—sometimes harder to overcome than a physical one—is prejudice and discrimination. People with disabilities sometimes face pity or avoidance from nondisabled people. Some nondisabled people focus so much on the disability that they overlook other characteristics, reacting to a person with a disability only as a problem category and not as an individual. Others treat the physically challenged as if they were children. Ultimately, such treatment can take its toll on the way people with disabilities think about themselves.

Stress and Coping: Dealing with Life's Challenges

LO 13.4 Summarize the effects of stress and what can be done about it.

It's 5:00 P.M. Rosa Convoy, a 25-year-old single mother, has just finished her work as a receptionist at a dentist's office and is on her way home. She has exactly two hours to pick up her daughter Zoe from child care, get home, make and eat dinner, pick up and return with a babysitter from down the street, say goodbye to Zoe, and get to her 7:00 programming class at a local community college. It's a marathon she runs every Tuesday and Thursday nights, and she knows she doesn't have a second to spare if she wants to reach the class on time.

stress
the physical and emotional response to events that threaten or challenge us

psychoneuroimmunology (PNI)
the study of the relationship among the brain, the immune system, and psychological factors

It doesn't take an expert to know what Rosa Convoy is experiencing: **stress**, the physical and emotional response to events that threaten or challenge us. How well Rosa, and everyone, can cope with stress depends on a complex interplay between physical and psychological factors.

Stress is a part of nearly everyone's existence, and our lives are crowded with events and circumstances, known as *stressors*, that produce threats to our well-being. Stressors need not be unpleasant events: Even the happiest events, such as starting a long-sought job or planning a wedding, can produce stress (Crowley, Hayslip, & Hobdy, 2003; Shimizu & Pelham, 2004).

Researchers in the new field of **psychoneuroimmunology (PNI)**—the study of the relationship among the brain, the immune system, and psychological factors—have found that stress produces several outcomes. The most immediate is typically a biological reaction, as certain hormones, secreted by the adrenal glands, cause a rise in heart rate, blood pressure, respiration rate, and sweating. In some situations, these immediate effects may be beneficial because they produce an "emergency reaction" in the sympathetic nervous system by which people are better able to defend themselves from a sudden, threatening situation (Ray, 2004; Kiecolt-Glaser, 2009; Janusek, Cooper, & Mathews, 2012; Irwin, 2015).

At the same time, long-term, continuous exposure to stressors may result in a reduction of the body's ability to deal with stress. As stress-related hormones are constantly secreted, the heart, blood vessels, and other body tissues may deteriorate. As a consequence, people become more susceptible to diseases as their ability to fight off germs declines. In short, both *acute stressors* (sudden, one-time events) and *chronic stressors* (long-term, continuing events) have the potential to produce significant

WATCH THIS VIDEO ON MYPSYCHLAB THE BASICS: STRESS AND YOUR HEALTH

physiological consequences (Lundberg, 2006; Graham, Christian, & Kiecolt-Glaser, 2006; Rohleder, 2012).

THE ORIGINS OF STRESS. Experienced job interviewers, college counselors, and owners of bridal shops all know that not everyone reacts the same way to a potentially stressful event. What makes the difference in people's reactions? According to psychologists Arnold Lazarus and Susan Folkman, people move through a series of stages, depicted in Figure 13-5, that determine whether they will experience stress (Lazarus & Folkman, 1984; Lazarus, 1968, 1991).

Primary appraisal is the first step—the individual's assessment of an event to determine whether its implications are positive, negative, or neutral. If a person sees the event as primarily negative, he or she appraises it in terms of the harm that it has caused in the past, how threatening it is likely to be, and how likely it is that the challenge can be resisted successfully. For example, you are likely to feel differently about an upcoming French test if you passed the last one with flying colors than you would if you did poorly.

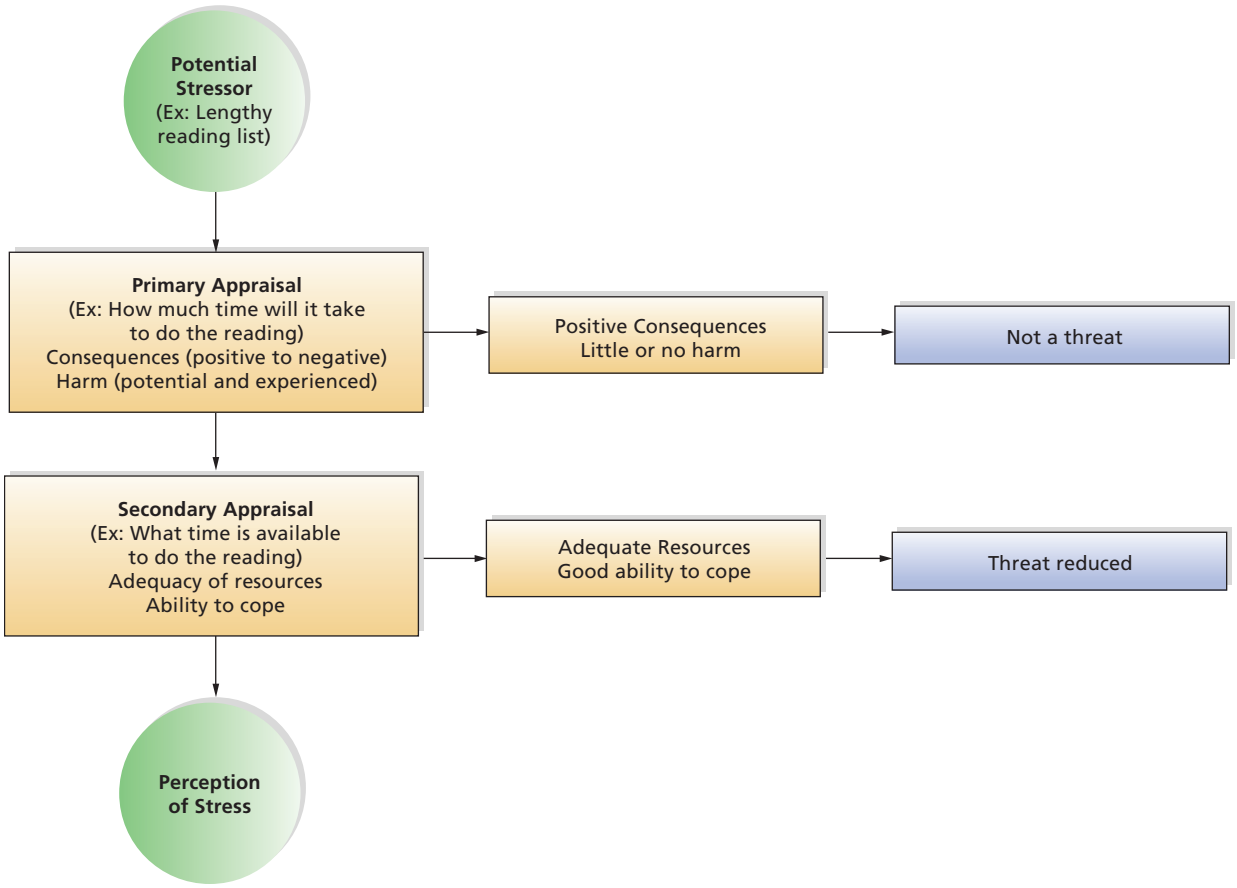
primary appraisal
the assessment of an event to determine whether its implications are positive, negative, or neutral

Secondary appraisal follows. **Secondary appraisal** is the person's answer to the question, "Can I handle it?"—an assessment of whether his or her coping abilities and resources are adequate to overcome the challenge posed by the potential stressor. At this point in the process, people try to determine if they will be able to meet the dangers in the situation. If resources are lacking, and the potential threat is great, they will experience stress. A traffic ticket is upsetting to anyone, but to those for whom the fine is an economic hardship, the stress is considerably greater.

secondary appraisal
the assessment of whether one's coping abilities and resources are adequate to overcome the harm, threat, or challenge posed by the potential stressor

Figure 13-5 Steps in the Perception of Stress

The way we appraise a potential stressor determines whether we will experience stress.
(**Source:** Based on Kaplan, Sallis, & Patterson, 1993.)



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STRESS ABOUT THE FUTURE: GARY, 25 YEARS OLD

Stress varies with the person's appraisal, and that appraisal varies with the person's temperament and circumstances. There are some general principles that help predict when an event will be appraised as stressful. Psychologist Shelley Taylor (2009) suggests the following:

- Events and circumstances that produce negative emotions are more likely to lead to stress than events that are positive. For example, planning for the adoption of a new baby produces less stress than dealing with the illness of a loved one.
- Situations that are uncontrollable or unpredictable are more likely to produce stress than those that can be controlled and predicted. Professors who give surprise quizzes in their classes, then, produce more stress than those whose quizzes are scheduled in advance.
- Events and circumstances that are ambiguous and confusing produce more stress than those that are unambiguous and clear. If people cannot easily understand a situation, they must struggle simply to comprehend it rather than dealing with it directly. Taking a new job that does not have a clear job description is likely to produce more stress than starting in a well-defined position.
- People who must accomplish simultaneously many tasks that strain their capabilities are more likely to experience stress than those who have fewer things to do. A graduate student who is expecting her first child during the same month she is scheduled to take her dissertation oral exam is likely to be feeling quite a bit of stress, for example.

THE CONSEQUENCES OF STRESS. Over the long run, the constant wear and tear caused by the physiological arousal that occurs as the body tries to fight off stress produces negative effects. If enough stress is experienced, it can have formidable costs. For instance, headaches, backaches, skin rashes, indigestion, chronic fatigue, and even the common cold are stress-related illnesses (Cohen, Tyrrell, & Smith, 1997; Suinn, 2001; Andreotti et al., 2014).

In addition, *the immune system*—the complex of organs, glands, and cells that constitutes our bodies' natural line of defense in fighting disease—may be damaged by stress. Because stress overstimulates the immune system, it may begin to attack the body itself, damaging healthy tissue rather than fighting invading bacteria and viruses. In addition, stress can prevent the immune system from reacting effectively, which can permit germs to reproduce more easily or allow cancer cells to spread more rapidly (Cohen et al., 2002; Caserta et al., 2008; Liu, N. et al., 2012).

psychosomatic disorders
medical problems caused by the interaction of psychological, emotional, and physical difficulties

Consequently, stress may lead to **psychosomatic disorders**, medical problems caused by the interaction of psychological, emotional, and physical difficulties. For instance, ulcers, asthma, arthritis, and high blood pressure may—though not invariably—be produced by stress (Davis et al., 2008; Marin et al., 2009; Wippert & Niemeyer, 2014).

In sum, stress affects people in a number of ways. It can increase the risk of becoming ill, it may actually produce illness, it makes it more difficult to recover from illness, and it may reduce one's ability to cope with future stress. (To get a sense of how much stress you have in your own life, complete the questionnaire in Table 13-1.) Keep in mind that although stress occurs at all stages of life, as we age, we may learn to cope with stress better. As we see next, coping takes a variety of forms.

COPING WITH STRESS. Stress is a normal part of life, something that everyone encounters. Yet, some young adults are better than others at **coping**, the effort to control, reduce, or learn to tolerate the threats that lead to stress (Taylor & Stanton, 2007). What is the key to successful coping?

coping
the effort to control, reduce, or learn to tolerate the threats that lead to stress

Some people use *problem-focused coping*, by which they attempt to manage a stressful problem or situation by directly changing the situation to make it less stressful. For

Table 13-1 How Stressed Are You?

The statements below will help you determine your level of stress. Mark the appropriate number in each box, then add up those numbers to find your score. Your answers should reflect your experiences in the last month only. To help you rate the extent of your stress, use the key at the bottom.

1. I become upset when something happens unexpectedly.

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

2. I feel I'm unable to control the things that are most important in my life.

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

3. I feel nervous and "stressed."

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

4. I feel confident about my ability to handle my personal problems.

☐ 4 = never, 3 = almost never, 2 = sometimes, 1 = fairly often, 0 = very often

5. In general, I feel things are going my way.

☐ 4 = never, 3 = almost never, 2 = sometimes, 1 = fairly often, 0 = very often

6. I'm able to control irritations in my life.

☐ 4 = never, 3 = almost never, 2 = sometimes, 1 = fairly often, 0 = very often

7. I feel I cannot cope with all the things I need to do.

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

8. Generally, I feel on top of things.

☐ 4 = never, 3 = almost never, 2 = sometimes, 1 = fairly often, 0 = very often

9. I get angry at things that are beyond my control.

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

10. I feel problems pile up to such an extent that I cannot overcome them.

☐ 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often

How Do You Measure Up?

Stress levels vary from person to person, but you can compare your total score to the averages below:

Age		Gender	
18–29	14.2	Men	12.1
30–44	13.0	Women	13.7
45–54	12.6		
55–64	11.9		
65 & over	12.0		

Marital Status	
Widowed	12.6
Married or living with	12.4
Single or never wed	14.1
Divorced	14.7
Separated	16.6

(**Source:** Based on Sheldon Cohen, Dept. of Psychology, Carnegie Mellon University.)

example, a man who is having on-the-job difficulties may speak to his boss and ask that his responsibilities be modified, or he may look for another job.

Other people employ *emotion-focused coping*, which involves the conscious regulation of emotion. For instance, a mother who is having trouble finding appropriate care for her child while she is at work may tell herself that she should look at the bright side: At least she has a job in a difficult economy (Folkman & Lazarus, 1988; Master et al., 2009).

Sometimes people acknowledge that they are in a stressful situation that cannot be changed, but they cope by managing their reactions. For example, they may take up meditation or exercise to reduce their physical reactions.

Coping is also aided by the presence of *social support*, assistance and comfort supplied by others. Turning to others in the face of stress can provide both emotional support (in the form of a shoulder to cry on) and practical, tangible support (such as a temporary financial loan). In addition, others can provide information, offering specific advice on how to deal with stressful situations. The ability to learn from others' experiences is one of the reasons that people use the Web to connect with people who have similar experiences (Kim, Sherman, & Taylor, 2008; Green, DeCourville, & Sadava, 2012; Vallejo-Sánchez & Pérez-García, 2015).

Finally, even if people do not consciously cope with stress, some psychologists suggest that they may use unconscious defensive coping mechanisms of which they are unaware and that aid in stress reduction. **Defensive coping** involves unconscious strategies that distort or deny the true nature of a situation. For instance, people may deny the seriousness of a threat, trivializing a life-threatening illness, or tell themselves that academic failure on a series of tests is unimportant.

defensive coping
coping that involves unconscious strategies that distort or deny the true nature of a situation

Another type of defensive coping is emotional insulation. In *emotional insulation*, people unconsciously try to prevent themselves from experiencing emotions. By attempting to remain unaffected by negative (or positive) experiences, they try to avoid the pain brought about by the experience. If defensive coping becomes a habitual response to

stress, it can prevent the person from dealing with the reality of the situation by offering a way to avoid or ignore the problem (Ormont, 2001).

In some cases, people use drugs or alcohol to escape from stressful situations. Like defensive coping, drinking and drug use do not help address the situation causing the stress, and they can increase a person's difficulties. For example, people may become addicted to the substances that initially provided them with a pleasurable sense of escape.

HARDINESS, RESILIENCE, AND COPING. The success with which young adults deal with stress depends in part on their *coping style*, their general tendency to deal with stress in a particular way. For example, people with a "hardy" coping style are especially successful in dealing with stress. **Hardiness** is a personality characteristic associated with a lower rate of stress-related illness.

hardiness
a personality characteristic associated with a lower rate of stress-related illness

Hardy individuals are take-charge people who revel in life's challenges. It is not surprising, then, that people who are high in hardiness are more resistant to stress-related

Are You an Informed Consumer of Development?

Coping with Stress

Although no single formula can cover all cases of stress, some general guidelines can help all of us cope with the stress that is part of our lives. Among them are the following (Sacks, 1993; Kaplan, Sallis, & Patterson, 1993; Bionna, 2006).

- Seek control over the situation producing the stress. Putting yourself in charge of a situation that is producing stress can take you a long way toward coping with it. For example, if you are feeling stress about an upcoming test, do something about it—such as starting to study.
- Redefine "threat" as "challenge." Changing the definition of a situation can make it seem less threatening. "Look for the silver lining" is not bad advice. For example, if you're fired, look at it as an opportunity to get a new, and potentially better, job.
- Find social support. Almost any difficulty can be faced more easily with the help of others. Friends, family members, and even telephone hotlines staffed by trained counselors can provide significant support. (For help in identifying appropriate hotlines, the U.S. Public Health Service maintains a "master" toll-free number that can provide the phone numbers and addresses of many national groups. Call 800-336-4794.)
- Use relaxation techniques. Reducing the physiological arousal brought about by stress can be a particularly effective way of coping with stress. A variety of techniques that produce relaxation, such as transcendental meditation, Zen and yoga, progressive muscle relaxation, and even hypnosis, have been shown to be effective in reducing stress. One technique that works particularly well was devised by physician Herbert Benson and is illustrated in Table 13-2 (Benson, 1993).
- Try to maintain a healthy lifestyle that will reinforce your body's natural coping mechanisms. Exercise, eat nutritiously, get enough sleep, and avoid or moderate your use of alcohol, tobacco, or other drugs.
- If all else fails, keep in mind that a life without any stress at all would be a dull one. Stress is a natural part of life, and successfully coping with it can be a gratifying experience.

Table 13-2 How to Elicit the Relaxation Response

Some general advice on regular practice of the relaxation response:

- Try to find 10 to 20 minutes in your daily routine; before breakfast is a good time.
- Sit comfortably.
- For the period you will practice, try to arrange your life so you won't have distractions. Turn off your cell phone, and ask someone else to watch the kids.
- Time yourself by glancing periodically at a clock or watch (but don't set an alarm). Commit yourself to a specific length of practice, and try to stick to it.

There are several approaches to eliciting the relaxation response. Here is one standard set of instructions:

Step 1. Pick a focus word or short phrase that's firmly rooted in your personal belief system. For example, a nonreligious individual might choose a neutral word like *one* or *peace* or *love*. A Christian person desiring to use a prayer could pick the opening words of Psalm 23, *The Lord is my shepherd*; a Jewish person could choose *Shalom*.
Step 2. Sit quietly in a comfortable position.
Step 3. Close your eyes.
Step 4. Relax your muscles.
Step 5. Breathe slowly and naturally, repeating your focus word or phrase silently as you exhale.
Step 6. Throughout, assume a passive attitude. Don't worry about how well you're doing. When other thoughts come to mind, simply say to yourself, "Oh, well," and gently return to the repetition.
Step 7. Continue for 10 to 20 minutes. You may open your eyes to check the time, but do not use an alarm. When you finish, sit quietly for a minute or so, at first with your eyes closed and later with your eyes open. Then do not stand for one or two minutes.
Step 8. Practice the technique once or twice a day.

(**Source:** Benson, 1993.)

illness than those who show less hardiness. Hardy people react to potentially threatening stressors with optimism, feeling that they can respond effectively. By turning threatening situations into challenging ones, they are less apt to experience high levels of stress (Maddi, 2006; Maddi et al., 2006; Andrew et al., 2008; Maddi, 2014).

For people who face the most profound of life's difficulties—such as the unexpected death of a loved one or a permanent injury, such as spinal cord damage—a key factor in their reactions is their level of resilience. As we first discussed in Chapter 8, *resilience* is the ability to withstand, overcome, and actually thrive following profound adversity (Werner, 2005; Kim-Cohen, 2007; Lipsitt & Demick, 2012).

Resilient young adults tend to be easygoing, good-natured, and have good social and communication skills. They are independent, feeling that they can shape their own fate and are not dependent on others or on luck. In short, they work with what they have, and they make the best of whatever situation in which they find themselves (Deshields et al., 2005; Friborg et al., 2005; Clauss-Ehlers, 2008). (Also see the *Are You an Informed Consumer of Development?* feature.)

Module 13.1 Review

- By young adulthood, the body and the senses are at their peak, but growth is proceeding, particularly in the brain. Even though young adults are generally as fit and healthy as they will ever be, accidents present the greatest risk of death. In the United States, violence is also a significant risk, particularly for nonwhite males.
- Even in young adulthood, health must be maintained by proper diet and exercise. Obesity is increasingly a problem for young adults.
- People with physical disabilities face not only physical barriers but also psychological barriers caused by prejudice and discrimination.
- Stress, which is a healthy reaction in small doses, can be harmful to body and mind if it is frequent or of long duration. The effort to control, reduce, or learn to tolerate stress is called *coping*. Coping strategies include problem-focused coping, emotion-focused coping, and relying on social support.

Journal Writing Prompt

Applying Lifespan Development: Why do different people react to the same stressful situations in different ways? Why do we all perceive stress differently?

Cognitive Development

Ben is known to be a heavy drinker, especially when he goes to parties. Tyra, Ben's wife, warns him that if he comes home drunk one more time, she will leave him and take the children. Tonight Ben is out late at an office party. He comes home drunk. Does Tyra leave Ben?

An adolescent who hears this situation (drawn from research by Adams and Labouvie-Vief, 1986) may find the case to be open-and-shut: Tyra leaves Ben. But in early adulthood, the answer becomes a bit less clear. As people enter adulthood, they become less concerned with the sheer logic of situations and instead take into account real-life concerns that may influence and temper behavior in particular instances.

Intellectual Growth in Early Adulthood

LO 13.5 Describe how cognitive development continues in young adulthood.

If cognitive development were to follow the same pattern as physical development, we would expect to find little new intellectual growth in early adulthood. In fact, Piaget, whose theory of cognitive development played such a prominent role in our earlier discussions of intellectual change, argued that by the time people left adolescence, their thinking, at least

The nature of thought changes qualitatively during early adulthood.

qualitatively, had largely become what it would be for the rest of their lives. People might gather more information, but the ways in which they think about it would not change.

Was Piaget's view correct? Increasing evidence suggests that he was mistaken.

POSTFORMAL THOUGHT. Developmental psychologist Giesela Labouvie-Vief suggests that the nature of thinking changes qualitatively during early adulthood. She asserts that thinking based solely on formal operations (Piaget's final stage, reached during adolescence) is insufficient to meet the demands placed on young adults. The complexity of society, which requires specialization, and the increasing challenge of finding one's way through all that complexity require thought that is not necessarily based on logic alone but also on practical experience, moral judgments, and values (Labouvie-Vief, 2006, 2009).

For example, imagine a young, single woman in her first job. Her boss, a married man whom she respects greatly and who is in a position to help her career, invites her to go with him to make an important presentation to a client. When the presentation, which has gone very well, is over, he suggests they go out to dinner and celebrate. Later that evening, after sharing a bottle of wine, he attempts to accompany her to her hotel room. What should she do?

Logic alone doesn't answer such questions. Labouvie-Vief suggests that as young adults are increasingly exposed to ambiguous situations like these, their thinking must develop to handle them. She suggests that young adults learn to use analogies and metaphors to make comparisons, confront society's paradoxes, and become comfortable with a more subjective understanding. Such thinking requires weighing all the aspects of a situation according to one's values and beliefs. It allows for interpretive processes and reflects the fact that reasons behind events in the real world are subtle, painted in shades of gray rather than in black and white (Thornton, 2004; Labouvie-Vief, 2015).

To demonstrate how this sort of thinking develops, in an experiment Labouvie-Vief presented participants, ranging in age from 10 to 40, with scenarios similar to the Ben and Tyra scenario at the beginning of this section. Each story had a clear, logical conclusion. However, the story could be interpreted differently if real-world demands and pressures were taken into account.

In responding to the scenarios, adolescents relied heavily on the logic inherent in formal operations. For instance, they would predict that Tyra would immediately pack up her bags and leave with the children when Ben came home drunk. After all, that's what she said she would do.

In contrast, young adults were less prone to use strict logic in determining a character's likely course of action. Instead, they would consider various possibilities that might come into the picture in a real-life situation: Would Ben be apologetic and beg Tyra not to leave? Did Tyra really mean it when she said she would leave? Does Tyra have some alternative place to go?

postformal thought
thinking that acknowledges that adult predicaments must sometimes be solved in relativistic terms

Young adults exhibited what Labouvie-Vief calls postformal thinking. **Postformal thought** is thinking that goes beyond Piaget's formal operations. Rather than being based on purely logical processes, with absolutely right and wrong answers to problems, postformal thought acknowledges that adult predicaments must sometimes be solved in relativistic terms.

Postformal thought also encompasses *dialectical thinking*, an interest in and appreciation for argument, counterargument, and debate (Basseches, 1984). Dialectical thinking

accepts that issues are not always clear-cut and that answers to questions are not always absolutely right or wrong but must sometimes be negotiated.

According to psychologist Jan Sinnott (1998a, 2009), postformal thought also takes into account real-world considerations when solving problems. Postformal thinkers can shift back and forth between an abstract, ideal solution and real-world constraints that might prevent the solution from being successfully implemented. In addition, postformal thinkers understand that just as there can be multiple causes of a situation, there can be multiple solutions.

In short, postformal thought and dialectical thinking acknowledge a world that sometimes lacks clearly right and wrong solutions to problems, a world in which logic may fail to resolve complex human questions. Instead, finding the best resolution to difficulties may involve drawing upon and integrating prior experiences. (Also see the From Research to Practice box.)

Approaches to Postformal Thinking

LO 13.6 Compare and contrast Perry's and Schaie's approaches to cognitive development in young adulthood.

In addition to Labouvie-Vief's approach to postformal thoughts, psychologists William Perry and K. Warner Schaie have proposed alternative approaches to postformal thought.

PERRY'S RELATIVISTIC THINKING. To psychologist William Perry (1981), early adulthood represents a period of developmental growth that encompasses mastery not just of particular bodies of knowledge but of ways of understanding the world. Perry examined the ways in which students grew intellectually and morally during college. In comprehensive interviews with a group of students at Harvard University, he found that students entering college tended to use *dualistic thinking* in their views of the world. For instance, they reasoned that something was right or it was wrong; people were good or they were bad; and others were either for them or against them.

From Research to Practice

Young Adult Brains Are Still Developing

Once you have reached young adulthood, you're free to explore a variety of new experiences from which society shields children and adolescents because their so-called impressionable minds are still developing. Parental guidance, consent, or supervision are no longer required. Your access to very violent movies, bars and nightclubs, and all kinds of other adult-only situations is increasingly unfettered. But is your brain really done developing?

Research indicates that it actually isn't, and it won't be until later in your twenties. Rather than being fully grown, the young adult brain continues to grow new neural connections and to prune away unused pathways. This is generally a good thing—it means that young adults' minds are still malleable and adaptive to new experiences. For example, learning a new language, musical instrument, or job skill is easier for young adults than it is for older adults (Whiting, Chenery, & Copland, 2011).

One part of the brain in particular, the prefrontal cortex, doesn't mature until well into young adulthood. This region is responsible for such higher-order mental functions as planning, decision making, and impulse control. It's little wonder, then, that the greatest risks to health and well-being in this stage of life mainly involve poor judgment—motor vehicle accidents, violence, drug abuse, and excessive drinking chief among them. But it's also a time of opportunity when young adults can instill such highly beneficial traits as resilience, self-control, and self-regulation (Raznahan et al., 2011; Giedd, 2012; Steinberg, 2014).

What you do with this time can have important implications going forward. For example, recent research found that the more that young adults used Facebook, the worse they felt at the time and the more their satisfaction with life declined over time. This fits with a broader concern expressed by scientists who study young adult brain development: The choice of activities in young adulthood can have lasting consequences, for better or worse (Beck, 2012; Giedd, 2012; Kross et al., 2013).

Shared Writing Prompt

What could young adults do to optimize their ongoing brain development?

As these students encountered new ideas and points of view from other students and their professors, however, their dualistic thinking declined. Consistent with the notion of changes in postformal thinking, students increasingly realized that issues can have more than one plausible side. Furthermore, they understood more clearly that it is possible to hold multiple perspectives on an issue. This multiple thinking was characterized by a shift in the way the students viewed authorities: Instead of presupposing that experts had all the answers, they began to assume that their own thinking on an issue had validity if their position was well thought out and rational.

From *an educator's* perspective

Can you think of situations that you would deal with differently as an adult than as an adolescent? Do the differences reflect postformal thinking?

According to Perry, they had entered a stage in which knowledge and values were regarded as relativistic. Rather than seeing the world as having absolute standards and values, they argued that different societies, cultures, and individuals could have different standards and values, and all of them could be equally valid.

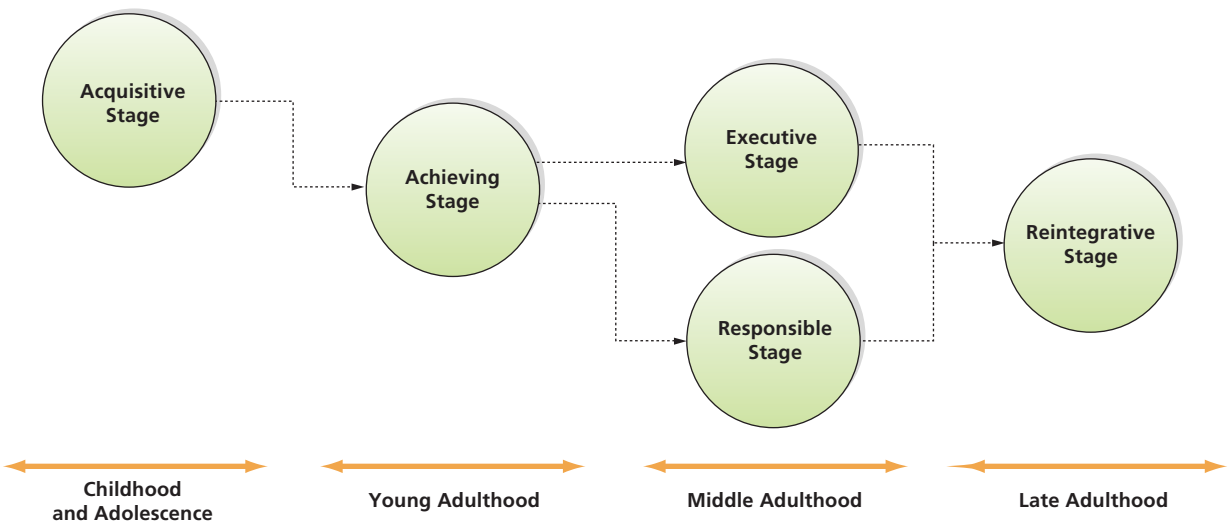
It's important to keep in mind that Perry's theory is based on a sample of interviews conducted with well-educated students attending an elite college. His findings may not apply as well to people who are not taught to examine multiple points of view as is common in a college education. Still, his notion that thinking continues to develop during early adulthood is widely accepted. As we consider next, other theories suggest that thinking changes in significant ways throughout adulthood.

SCHAIE'S STAGES OF DEVELOPMENT. Developmental psychologist K. Warner Schaie offers another perspective on postformal thought. Taking up where Piaget left off, Schaie suggests that adults' thinking follows a set pattern of stages (illustrated in Figure 13-6). But Schaie focuses on the ways in which information is *used* during adulthood rather than on changes in the acquisition and understanding of new information, as in Piaget's approach (Schaie & Willis, 1993; Schaie & Zanjani, 2006).

acquisitive stage
according to Schaie, the first stage of cognitive development, encompassing all of childhood and adolescence, in which the main developmental task is to acquire information

Schaie suggests that before adulthood, the main cognitive developmental task is acquisition of information. Consequently, he labels the first stage of cognitive development, which encompasses all of childhood and adolescence, the **acquisitive stage**. Information gathered before we grow up is largely squirreled away for future use. In fact, much of the rationale for education during childhood and adolescence is to prepare people for future activities.

Figure 13-6 Schaie's Stages of Adult Development
(**Source:** Based on Schaie, 1977–1978.)



The situation changes considerably in early adulthood, however. Instead of targeting the future use of knowledge, the focus shifts to the "here and now." According to Schaie, young adults are in the achieving stage, applying their intelligence to attaining long-term goals regarding their careers, family, and contributions to society. During the **achieving stage**, young adults must confront and resolve several major issues, and the decisions they make—such as what job to take and whom to marry—have implications for the rest of their lives.

During the late stages of early adulthood and in middle adulthood, people move into what Schaie calls the responsible and executive stages. In the **responsible stage**, middle-aged adults are mainly concerned with protecting and nourishing their spouses, families, and careers.

Sometime later, further into middle adulthood, many people (but not all) enter the **executive stage** in which they take a broader perspective, becoming more concerned about the larger world (Sinnott, 1997). Rather than focusing only on their own lives, people in the executive stage also put energy into nourishing and sustaining societal institutions. They may become involved in town government, religious congregations, service clubs, charitable groups, factory unions—organizations that have a larger purpose in society. People in the executive stage, then, look beyond their individual situations.

Old age, according to Schaie's model, marks entry into the final period, the **reintegrative stage**, the period of late adulthood during which people focus on tasks that have personal meaning. In this stage, they no longer focus on acquiring knowledge as a means of solving potential problems that they may encounter. Instead, their information acquisition is directed toward particular issues that specifically interest them.

Furthermore, they have less interest in—and patience for—things that they do not see as having some immediate application to their lives. Thus, the abstract issue of whether the federal budget should be balanced may be of less concern to an elderly individual than whether the government should provide universal health care.

Schaie's perspective on cognitive development reminds us that cognitive change doesn't stop at adolescence, as Piaget would contend. Instead, there are significant changes that continue throughout early adulthood and onward.

achieving stage
the point reached by young adults in which intelligence is applied to specific situations involving the attainment of long-term goals regarding careers, family, and societal contributions

responsible stage
the stage in which the major concerns of middle-aged adults relate to their personal situations, including protecting and nourishing their spouses, families, and careers

executive stage
the period in middle adulthood when people take a broader perspective than earlier, including concerns about the world

reintegrative stage
the period of late adulthood during which the focus is on tasks that have personal meaning

From *an educator's* perspective

Do you think educators can teach people to be more intelligent? Are there components or varieties of intelligence that might be more "teachable" than others? If so, which—componential, experiential, contextual, practical, or emotional?

Intelligence: What Matters in Early Adulthood?

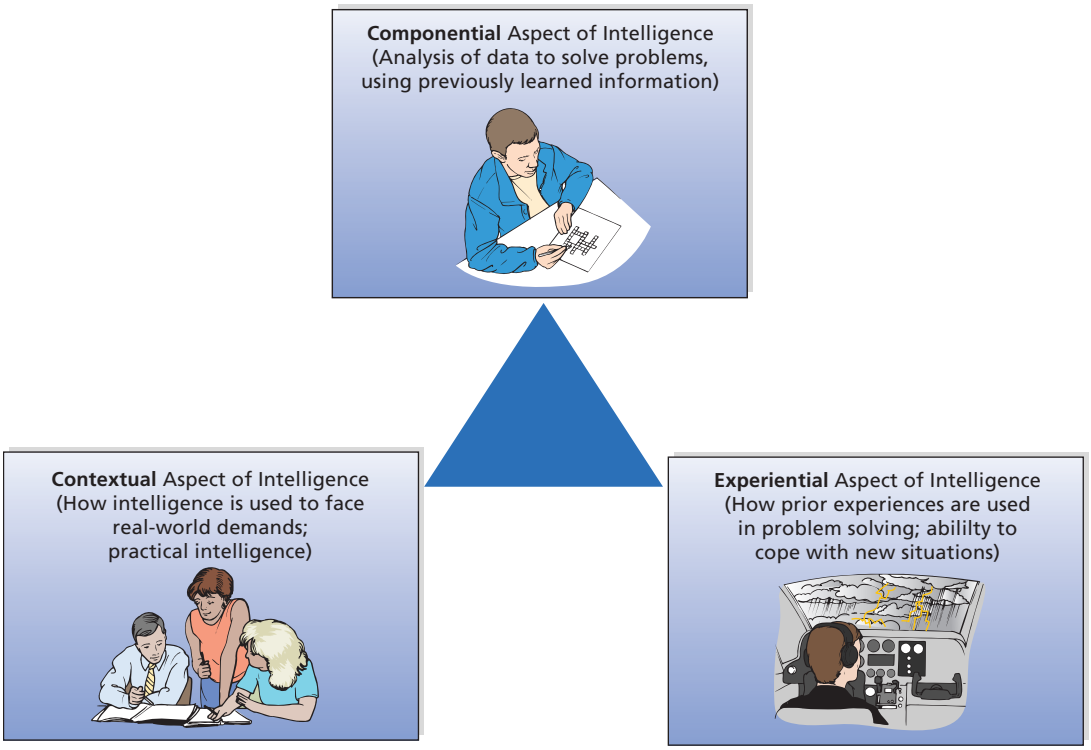
LO 13.7 Explain how intelligence is defined today and how life events cause cognitive growth in young adults.

> *Your year on the job has been generally favorable. Performance ratings for your department are at least as good as they were before you took over, and perhaps even a little better. You have two assistants. One is quite capable. The other just seems to go through the motions and is of little real help. Even though you are well liked, you believe that there is little that would distinguish you in the eyes of your superiors from the nine other managers at a comparable level in the company. Your goal is rapid promotion to an executive position. (Based on Wagner & Sternberg, 1985, p. 447)*

How do you meet your goal?

The way adults answer this question has a great deal to do with their future success, according to psychologist Robert Sternberg. The question is one of a series designed to assess a particular type of intelligence that may have more of an impact on future success than the type of intelligence measured by traditional IQ tests (of the sort we discussed in Chapter 9).

Figure 13-7 Sternberg's Triarchic Theory of Intelligence
(**Source:** Based on Sternberg, 1985, 1991.)



triarchic theory of intelligence
Sternberg's theory that intelligence is made up of three major components: componential, experiential, and contextual

In his **triarchic theory of intelligence**, Sternberg suggests that intelligence is made up of three major components: componential, experiential, and contextual (see Figure 13-7). The *componential* aspect includes the mental components involved in analyzing data used in solving problems, especially problems involving rational behavior. It relates to people's ability to select and use formulas, to choose appropriate problem-solving strategies, and in general to make use of what they have been taught. The *experiential* component refers to the relationship between intelligence, people's prior experience, and their ability to cope with new situations. This is the insightful aspect of intelligence, which allows people to relate what they already know to a new situation and an array of facts never before encountered. Finally, the *contextual* component of intelligence involves the degree of success people demonstrate in facing the demands of their everyday, real-world environments. For instance, the contextual component is involved in adapting to on-the-job professional demands (Sternberg, 2005).

Traditional intelligence tests, which yield an IQ score, tend to focus on the componential aspect of intelligence. Yet increasing evidence suggests that a more useful measure, particularly when one is looking for ways to compare and predict adult success, is the contextual component—the aspect of intelligence that has come to be called practical intelligence.

PRACTICAL AND EMOTIONAL INTELLIGENCE. According to Robert Sternberg, the IQ score that most traditional tests produce relates quite well to academic success. However, IQ seems to be unrelated to other types of achievement, such as career success. For example, although it is clear that success in business settings requires some minimal level of the sort of intelligence measured by IQ tests, the rate of career advancement and the ultimate success of business executives are only marginally related to IQ scores (Cianciolo et al., 2006; Sternberg, 2006; Grigorenko et al., 2009; Ekinci, 2014).

Sternberg contends that success in a career necessitates a type of intelligence—called practical intelligence—that is substantially different from that involved in traditional

academic pursuits (Sternberg et al., 1997). While academic success is based on knowledge of particular types of information, obtained largely from reading and listening, **practical intelligence** is learned primarily by observing others and modeling their behavior. People who are high in practical intelligence have a good "social radar." They are able to understand and handle even new situations effectively, reading people and circumstances insightfully, based on their previous experiences.

practical intelligence
according to Sternberg, intelligence that is learned primarily by observing others and modeling their behavior

Related to this sort of mental ability is another type of intelligence involving emotional domains. **Emotional intelligence** is the set of skills that underlies the accurate assessment, evaluation, expression, and regulation of emotions. Emotional intelligence is what gives some people the ability to get along well with others, to understand what others are feeling and experiencing, and to respond appropriately to the needs of others. It permits a person to tune into others' feelings, allowing an individual to respond appropriately. Emotional intelligence is also of obvious value to career and personal success as a young adult (Mayer, Salovey, Caruso, 2008; Nelis et al., 2009; Kross & Grossmann, 2012).

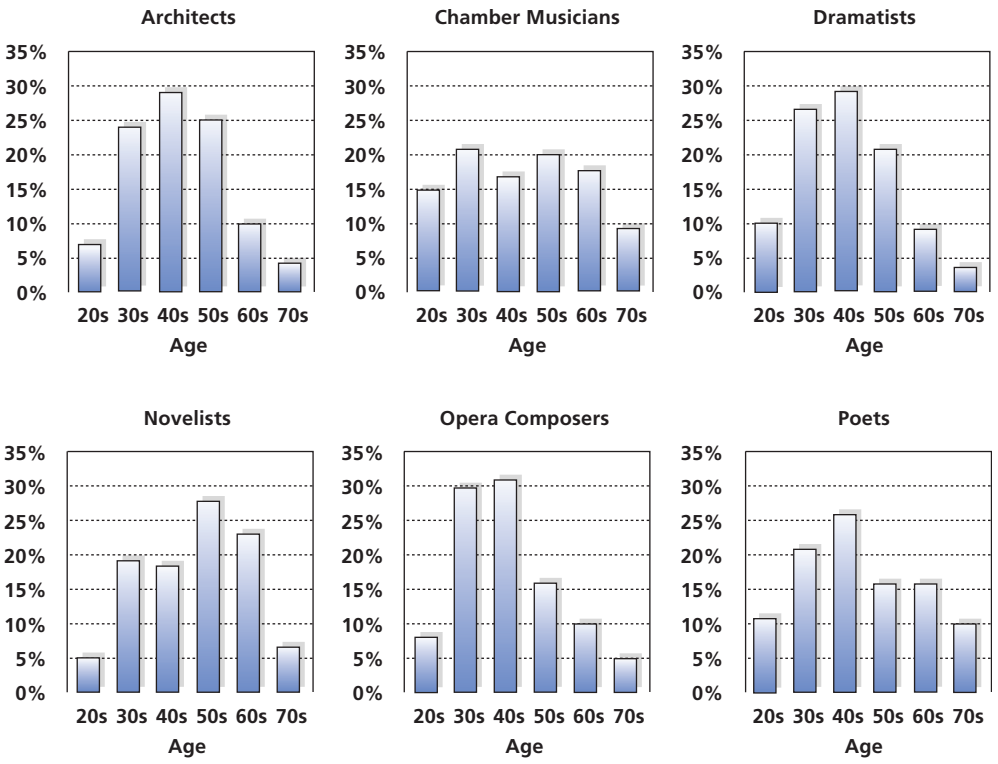
emotional intelligence
the set of skills that underlie the accurate assessment, evaluation, expression, and regulation of emotions

CREATIVITY: NOVEL THOUGHT. The hundreds of musical compositions of Wolfgang Amadeus Mozart, who died at the age of 35, were largely written during early adulthood. The same is true of many other creative individuals: Their major works were produced during early adulthood (Dennis, 1966a; see Figure 13-8).

One reason for the higher productivity of early adulthood may be that *after* early adulthood, creativity can be stifled by a situation that psychologist Sarnoff Mednick (1963) described as "familiarity breeds rigidity." By this he meant that the more people know about a subject, the less likely they are to be creative in that area. According to such reasoning, people in early adulthood may be at the peak of their creativity because many of the problems they encounter on a professional level are novel—or at least new

Figure 13-8 Creativity and Age

The period of maximum creativity differs depending on the particular field. The percentages refer to the percent of total lifetime major works produced during the particular age period. Why do poets peak earlier than novelists?
(**Source:** Based on Dennis, 1966.)



to them. As they get older, however, and become more familiar with the problems, their creativity may be stymied.

Not everybody, however, seems to have this problem. Many people do not reach their pinnacle of creativity until much later in life. For instance, Buckminster Fuller did not devise his major contribution, the geodesic dome, until he was in his 50s. Frank Lloyd Wright designed the Guggenheim Museum in New York at age 70. Charles Darwin and Jean Piaget were still writing influential works well into their 70s, and Picasso was painting in his 90s. Furthermore, when we look at overall productivity, as opposed to the period of a person's most important output, we find that productivity remains fairly steady throughout adulthood, particularly in the humanities (Simonton, 2009).

Overall, the study of creativity reveals few consistent developmental patterns. One reason for this is the difficulty of determining just what constitutes an instance of **creativity**, which is defined as the combination of responses or ideas in novel ways. Because definitions of what is "novel" may vary from one person to the next, it is hard to identify a particular behavior unambiguously as creative.

creativity
the combination of responses or ideas in novel ways

That ambiguity hasn't stopped psychologists from trying. For instance, one important component of creativity is a person's willingness to take risks that may result in potentially high payoffs. Creative people are analogous to successful stock market investors, who try to follow the "buy low, sell high" rule. Creative people develop and endorse ideas that are unfashionable or regarded as wrong ("buying low"). They assume that eventually others will see the value of the ideas and embrace them ("selling high"). According to this theory, creative adults take a fresh look at ideas or problem solutions that might initially be discarded, particularly if the problem is a familiar one. They are flexible enough to move away from the way they have typically done things and to consider new approaches and opportunities (Sternberg, Kaufman, & Peretz, 2002; Sternberg, 2009; Sawyer, 2012).

Profound events such as the birth of a child or the death of a loved one can stimulate cognitive development by offering an opportunity to reevaluate our place in the world. What are some other profound events that might stimulate cognitive development?

LIFE EVENTS AND COGNITIVE DEVELOPMENT. Marriage. The death of a parent. Starting a first job. The birth of a child. Buying a house. The course of life comprises many events such as these—important milestones on the path through the life span. Such occurrences, whether they are welcome or unwanted, clearly may bring about stress, as we saw earlier in this chapter. But do they also cause cognitive growth?

Although the research is still spotty and largely based on case studies, some evidence suggests that major life events may lead to cognitive growth. For instance, the birth of a child—a profound event—may trigger fresh insights into the nature of one's relationships with relatives and ancestors, one's broader place in the world, and the role one has in perpetuating humanity. Similarly, the death of a loved one may cause people to reevaluate what is important to them and to look anew at the manner in which they lead their lives (Kandler et al., 2012; Karatzias, Yan, & Jowett, 2015).

Experiencing the ups and downs of life events may lead young adults to think about the world in novel, more complex and sophisticated, and often less rigid ways. Rather than applying formal logic to situations—a strategy of which they are fully capable—they apply the broader perspective of postformal thought that we described earlier in this chapter, seeing trends and patterns, personalities and choices. Such thinking allows them to deal more effectively with the complex social worlds (to be discussed in Chapter 14) of which they are a part.

Module 13.2 Review

- Cognitive development continues into young adulthood with the emergence of postformal thought, which goes beyond logic to encompass interpretive and subjective thinking.
- Perry suggests that people move from dualistic thinking to relativistic thought during early adulthood. According to Schaie, people pass through five stages of information usage: acquisitive, achieving, responsible, executive, and reintegrative.
- New views of intelligence encompass the triarchic theory, practical intelligence, and emotional intelligence. Creativity seems to peak during early adulthood, with young adults viewing even long-standing problems as novel situations. Major life events contribute to cognitive growth by providing opportunities and incentives to rethink one's self and one's world.

Journal Writing Prompt

Applying Lifespan Development: Think of some of the ups and downs you have experienced—perhaps the death of a loved one, moving to a new place, or committing to a relationship. Did these events change the way that you view the world or other perspectives in any way?

College: Pursuing Higher Education

As soon as the class ends at 3:30, Laura Twombly, returning to college at age 30, packs her books, and rushes to her car. She speeds to reach her job by 4 P.M., anxious to avoid another warning from her supervisor. After her shift, she picks up her son, Derek, from her mother's house and hurries home.

From 8:30 to 9:30 Laura spends time with Derek before putting him to bed. At 10, she starts studying for her business ethics test. She gives up at 11, setting the alarm for 5 A.M. so she can finish studying before Derek wakes around 7. Then she dresses and feeds him and herself and hurries to drop Derek off at her mother's house and starts another round of classes, work, study, and mothering.

One-third of college students are above the age of 24, and Laura Twombly is one of them. She faces unusual challenges as she pursues the goal of a college degree. Older students like her are just one aspect of the increasing diversity—in family background, socioeconomic status, race, and ethnicity—that characterizes college campuses today.

For any student, though, attending college is a significant accomplishment. Although you may believe that college attendance is commonplace, this is not the case at all: Nationwide, high school graduates who enter college are actually in the minority.

The Demographics of Higher Education

LO 13.8 Describe who attends college today and how the college population is changing.

What types of students enter college? As in the U.S. population as a whole, U.S. college students are primarily white and middle class. About 58 percent of the college population aged 18 to 24 years old is white, compared with 19 percent Hispanic, 14 percent black, 7 percent Asian, and 2 percent other races or ethnicities (U.S. Department of Education, 2012; see Figure 13-9).

Furthermore, the proportion of students who enter college but ultimately never graduate is substantial. Only around 40 percent of those who start college finish four years later with a degree. Although about half of those who don't receive a degree in four years eventually do finish, the other half never obtain a college degree. For minorities, the picture is even worse: The national dropout rate for African American college students stands at 60 percent, as measured by the number of African American students who graduate within six years of starting college (Casselman, 2014).

For students who do not attend or complete college, the consequences can be significant. Higher education is an important way for people to improve their economic

well-being. Just three percent of adults who have a college education live below the poverty line. Compare that with high school dropouts: They are 10 times more likely to be living in poverty (see Figure 13-10; U.S. Bureau of Labor Statistics, 2012).

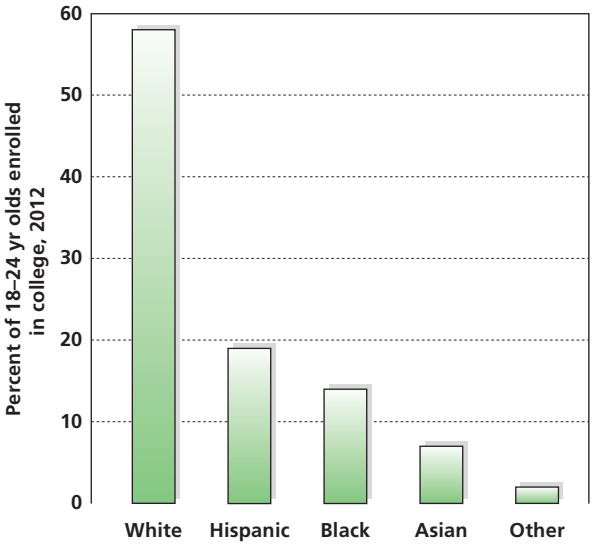
THE GENDER GAP IN COLLEGE ATTENDANCE. More women than men attend college, and the proportion of women, relative to men, is increasing. There already are more women than men enrolled in college, with women receiving 133 bachelor's degrees for every 100 that men receive. The gender gap is even more evident for minority students, with 166 African American women attending college for every 100 African American men (Sum, Fogg, & Harrington, 2003; Adebayo, 2008).

Why is there a gender gap in college attendance? It may be that men have more opportunities to earn money when they graduate from high school, and they find these immediate opportunities more seductive than college. For instance, the military, trade unions, and jobs that require physical strength may be more attractive to men, and consequently more men than women may perceive that good options other than college are available. Furthermore, as affirmative action has become less of a factor in admissions, women often have better high school academic records than men, and they may be admitted to college at greater rates (Dortch, 1997; Buchmann & DiPrete, 2006; England & Li, 2006).

Figure 13-9 College Enrollment by Racial Group

The proportion of nonwhites who attend college is far lower than the proportion of whites.

(**Source:** U.S. Department of Education, 2012.)



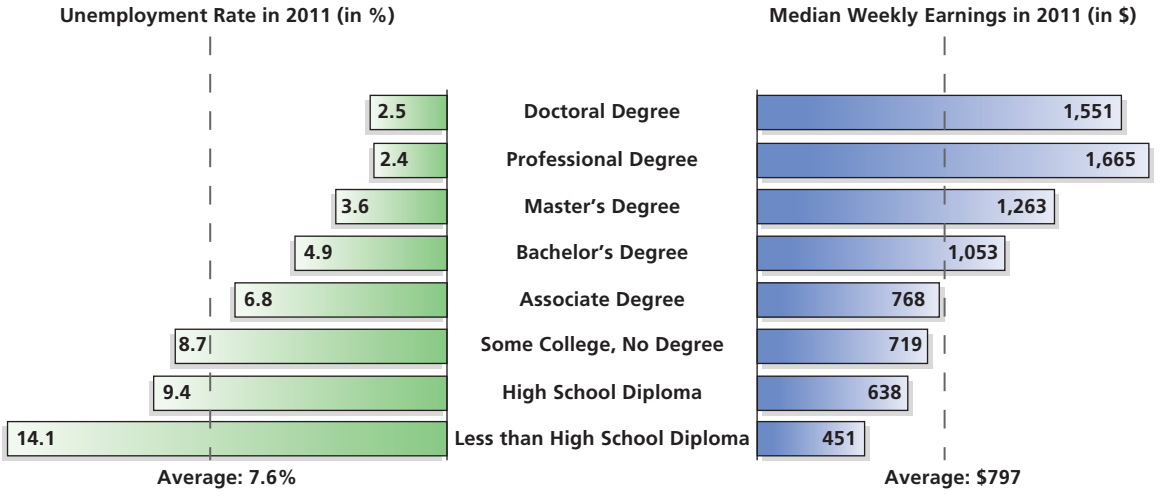
THE CHANGING COLLEGE STUDENT: NEVER TOO LATE TO GO TO COLLEGE? If the phrase "average college student" brings to mind an image of an 18- or 19-year-old, you should begin to rethink your view. Increasingly, students are older. In fact a quarter of students taking college courses for credit in the United States are between the ages of 25 and 35, like Laura Twombly, the 30-year-old student profiled earlier. Two-thirds of community college students are age 22 or older, and 14 percent are 40+ years old. (U.S. Department of Education, 2005; American Association of Community Colleges, 2015).

Why are so many older, nontraditional students taking college courses? One reason is economic. As a college degree becomes

Figure 13-10 Education and Economic Security

Education provides more than knowledge; it is also an important means to attain economic security for both men and women.

(**Source:** U.S. Bureau of Labor Statistics, 2012.)



increasingly important in obtaining a job, some workers feel compelled to get the credential. Many employers encourage or require workers to undergo training to learn new skills or update their old ones.

In addition, as people age, they may begin to feel the need to settle down with a family. This change in attitude can reduce their risk-taking behavior and make them focus more on acquiring the ability to support their family—a phenomenon that has been labeled *maturation reform.*

From *an educator's* perspective

How is the presence of older students likely to affect the college classroom, given what you know about human development? Why?

According to developmental psychologist Sherry Willis (1985), several broad goals underlie adults' participation in learning experiences. First, adults may be seeking to understand their own aging. As they get older, they try to figure out what is happening to them and what to expect in the future. Second, adults seek education in order to understand more fully the rapid technological and cultural changes that characterize modern life.

Furthermore, adult learners may be seeking a practical edge in combating obsolescence on the job. Some individuals also may be attempting to acquire new vocational skills. Finally, adult educational experiences may be seen as helpful in preparing for future retirement. As adults get older, they become increasingly concerned with shifting from a work orientation to a leisure orientation, and they may see education as a means of broadening their possibilities.

College Adjustment: Reacting to the Demands of College Life

LO 13.9 Summarize the difficulties students face as they enter college.

When you began college, did you feel depressed, lonely, anxious, and withdrawn from others? If you did, you weren't alone. Many students, particularly those who are recent high school graduates and who are living away from home for the first time, experience difficulties in adjustment during their first year in college. The **first-year adjustment reaction** is a cluster of psychological symptoms, including loneliness, anxiety, and depression, relating to the college experience. Although any first-year student may suffer from one or more of the symptoms of first-year adjustment reaction, it is particularly likely to occur among students who have been unusually successful, either academically or socially, in high school. When they begin college, their sudden change in status may cause them distress.

first-year adjustment reaction
a cluster of psychological symptoms, including loneliness, anxiety, withdrawal, and depression, relating to the college experience suffered by first-year college students

Students who have been successful and popular in high school are particularly vulnerable to first-year adjustment reaction in college. Counseling, as well as increasing familiarity with campus life, can help a student adjust.

First-generation college students, who are the first in their families to attend college, are particularly susceptible to difficulties during their first year of college. They may arrive at

college without a clear understanding of how the demands of college differ from those of high school, and the social support they have from their families may be inadequate. In addition, they may be less well prepared for college work (Barry et al., 2009; Credé & Niehorster, 2012).

Most often, the first-year adjustment reaction passes as students make friends, experience academic success, and integrate themselves into campus life. In other cases, though, the problems remain and may fester, leading to more serious psychological difficulties. (Also see the Are you an *Informed Consumer of Development?* feature.)

Are You an Informed Consumer of Development?

When Do College Students Need Professional Help with Their Problems?

A college friend comes to you and says that she has been feeling depressed and unhappy and can't seem to shake the feeling. She doesn't know what to do and thinks that she may need professional help. How do you answer her?

Although there are no hard-and-fast rules, several signals can be interpreted to determine whether professional help is warranted (Engler & Goleman, 1992). Among them are the following:

- Psychological distress that lingers and interferes with a person's sense of well-being and ability to function (such as depression so great that someone has trouble completing his or her work)
- Feelings that one is unable to cope effectively with the stress
- Hopeless or depressed feelings, with no apparent reason
- Inability to build close relationships with others
- Physical symptoms such as headaches, stomach cramps, and skin rashes that have no apparent underlying cause

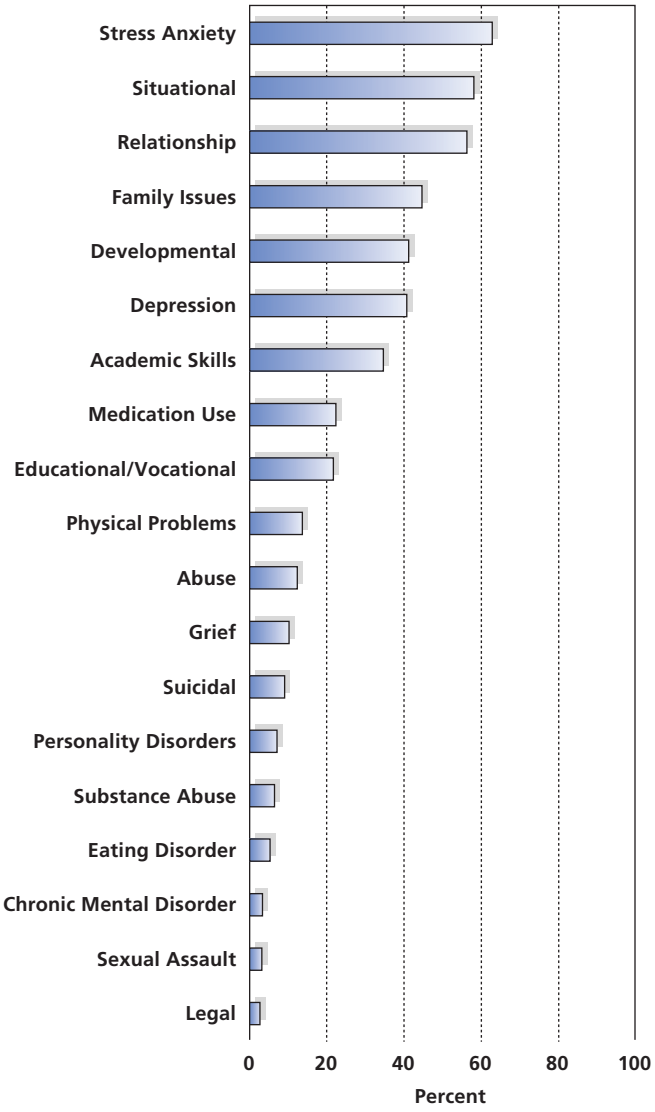
If some of these signals are present, it would be helpful to discuss them with some kind of help provider—such as a counseling psychologist, clinical psychologist, or other mental health worker. The best place to start is the campus medical center. A personal physician, neighborhood clinic, or local board of health can also provide a referral.

How prevalent are concerns about psychological problems? Surveys find that almost half of college students report having at least one significant psychological issue. Other research found that more than 40 percent of students who visited a college counseling center reported being depressed (see Figure 13-11). Remember, though, that these figures include only those students who sought help from the counseling center and not those who did not seek treatment. Consequently, the figures are not representative of the entire college population (Benton et al., 2003).

Figure 13-11 College Problems

The difficulties most frequently reported by college students visiting a campus counseling center.

(**Source:** Benton et al., 2003.)



Gender and College Performance

LO 13.10 Describe how gender effects the treatment of college students.

> *I registered for a calculus course my first year at DePauw. Even 20 years ago I was not timid, so on the very first day I raised my hand and asked a question. I still have a vivid memory of the professor rolling his eyes, hitting his head with his hand in frustration, and announcing to everyone, "Why do they expect me to teach calculus to girls?" I never asked another question. Several weeks later I went to a football game, but I had forgotten to bring my ID. My calculus professor was at the gate checking IDs, so I went up to him and said, "I forgot my ID but you know me, I'm in your class." He looked right at me and said, "I don't remember you in my class." I couldn't believe that someone who changed my life and whom I remember to this day didn't even recognize me. (Sadker & Sadker, 1994, p. 162)*

Although such incidents of blatant sexism are less likely to occur today, prejudice and discrimination directed at women are still a fact of college life. For instance, the next time you are in class, consider the gender of your classmates—and the subject matter of the class. Although men and women attend college in roughly equal proportions, there is significant variation in the classes they take. Classes in education and the social sciences, for instance, typically have a larger proportion of women than men; and classes in engineering, the physical sciences, and mathematics tend to have more men than women.

Even women who start out in mathematics, engineering, and the physical sciences are more likely than men to drop out. For instance, the attrition rate for women in such fields during the college years is two-and-one-half times greater than the rate for men. And although the number of women seeking graduate degrees in science and engineering has been increasing, women still lag behind men in the numbers seeking to enter those fields (National Science Foundation, 2002; York, 2008; Halpern, 2014).

The differences in gender distribution and attrition rates across subject areas are no accident. They reflect the powerful influence of gender stereotypes that operate throughout the world of education—and beyond. For instance, when women in their first year of college are asked to name a likely career choice, they are much less apt to choose careers that have traditionally been dominated by men, such as engineering or computer programming, and more likely to choose professions that have traditionally been populated by women, such as nursing and social work. Furthermore, even when they do choose to enter math- and science-related fields, they may face sex discrimination (CIRE, 1990; Ceci & Williams, 2010; Lane, Goh, & Driver-Linn, 2012).

Women also expect to earn less than men, both when they start their careers and when they are at their peaks. These expectations jibe with reality: On average, women earn 78 cents for every dollar that men earn (Bureau of Labor Statistics, 2012; DeNavas-Walt & Proctor, 2013; Catalyst, 2015).

Male and female college students also have different expectations regarding their areas of competence. For instance, one survey asked first-year college students whether they were above or below average on a variety of traits and abilities. As shown in Figure 13-12, men were more likely than women to think of themselves as above average in overall academic and mathematical ability, competitiveness, and emotional health.

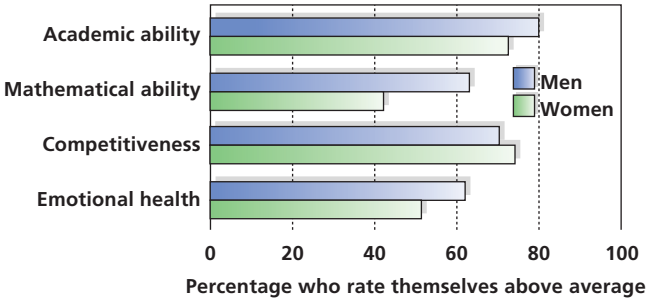
Both male and female college professors treat men and women differently in their classes, even though the different treatment is largely

As a result of the powerful influence of gender stereotypes in the world of education, women are underrepresented in the areas of physical science, math, and engineering. What can be done to reverse this trend?

Figure 13-12 The Great Gender Divide

During their first year of college, men, compared to women, are more apt to view themselves as above average on several spheres relevant to academic success. What is the root of this difference?

(**Source:** The American Freshman: National Norms for Fall, 1990; Astin, Korn, & Berz, 1989. Higher Education Research Institute, UCLA.)



unintentional and the professors are unaware of their actions. For instance, professors call on men in class more frequently than women, and they make more eye contact with men than with women. Furthermore, male students are more likely than women to receive extra help from their professors. Finally, the quality of the responses received by male and female students differs, with male students receiving more positive reinforcement for their comments than female students—exemplified by the startling illustration in Table 13-3 (AAUW, 1992; Sadker & Sadker, 1994; D'Lima, Winsler, & Kitsantas, 2014).

BENEVOLENT SEXISM: WHEN BEING NICE IS NOT SO NICE. Although some cases of unequal treatment of women represent *hostile sexism*, in which people treat women in a way that is overtly harmful, in other cases women are the victims of benevolent sexism. *Benevolent sexism* is a form of sexism in which women are placed in stereotyped and restrictive roles that appear, on the surface, to be positive.

Benevolent sexism even seems, at first, to be beneficial to women. For instance, a male college professor may compliment a female student on her good looks or offer to give her an easier research project so she won't have to work so hard. Although the professor may feel that he is merely being thoughtful, in fact he may be making the woman feel that she is not being taken seriously and he may be undermining her view of her competence. In short, benevolent sexism can be just as harmful as hostile sexism (Greenwood & Isbell, 2002; Dardenne, Dumont, & Bollier, 2007; Glick & Fiske, 2012; Rudman & Fetterolf, 2014).

Table 13-3 Gender Bias in the Classroom

The course on American Political History is one of four required university courses for freshmen. The last class before the final exam is attended by 70 students, divided almost equally between males and females. The professor begins by asking if there are questions about the final. Several people raise their hands.

JAMES: Do we have to memorize specific bills that were passed or the amendments to the Constitution? Or will the test be more general?
PROFESSOR: You will need to know the content and dates of major legislation, including constitutional amendments. You don't have to memorize every word, but know what they mean, when they happened, and why they matter. If I were you, James, I would go over my notes with a fine-toothed comb.
CAITLIN: Will there be any multiple choice questions?
PROFESSOR: Seven essay questions. You'll select five. I'd advise bringing two or three blue books.
CAITLIN: Will we have the whole two hours?
PROFESSOR: Yes. Anyone else?
DAVE (calling out): Will we be allowed to bring one page of notes, like on the midterm?
PROFESSOR: I haven't yet decided. Do you think the notes really help you?
DAVE: Yeah. I think they take some of the pressure off. And preparing them gets people to study for the test.
PROFESSOR: You make a good point about getting people to study. I'll consider it. Brian?
BRIAN: If we do better on the final than the midterm, will it raise our final grade?
PROFESSOR: The midterm and the research paper are 30 percent each. The final exam is 40 percent. But I look for improvement, so an excellent grade on the final will tip the scales in your favor. Why don't we begin?
The professor lectures on *Citizens United* for 20 *minutes* before he asks a question about campaign funding. Interest in campaign funding runs a distant second to what's on the final exam, so only a few hands are raised. The professor calls on Dave.
DAVE: Citizens United doesn't allow corporations or unions to contribute directly to a candidate's campaign fund, but it does allow them to pay for ads asking people to vote for a particular candidate.
PROFESSOR: Good point, Dave. You've zeroed in on what was an important distinction in the mind of the court. (He smiles at Dave, and Dave smiles back.) Do you think, in actual practice, the distinction holds up? (Five hands go up, five out of seventy.) Eleanor?
ELEANOR: I think—well, I don't know if this is right—but I think maybe the Supreme Court justices who voted in favor of *CU*, they tend to be conservative and I think they wanted—"
DAVE (calling out): Oh yeah, blame it on the conservatives. You guys on the left are just sore because no one with bucks to spend wants to do ads for any of your loser candidates. (Eleanor looks upset but says nothing. Several students laugh, and the professor smiles. He calls on Jessica.)
JESSICA: I think the recent election shows you can't just buy—
NICK (interrupting Jessica, calls out): The distinction holds up because in the corporate ads, the candidate can't come out and say 'I'm so-and-so and I approve this ad.' People can tell the difference."
PROFESSOR: Good point, Nick. But doesn't the potential volume of advertising possible under *CU* have to be considered? Jacob?
JACOB: I guess so. If one candidate gets all the big corporate advertising, it could maybe wipe out the other candidate.
PROFESSOR: Do you think people are ultimately swayed by campaign ads? If they see a hundred ads saying don't vote for Candidate X and only ten ads saying vote for Candidate X, do they make up their minds by the numbers?
JACOB: They probably just tune out after a while. Maybe the candidate who says don't vote for the other person, they're a loser, maybe people get tired of hearing those attacks.
PROFESSOR: There's some real evidence for that, Jacob. Good. Melissa, do you want to say something? (Melissa's hand is at "half-mast," raised but just barely. When the professor calls her name, she looks a bit startled.)
MELISSA (speaking very softly): Maybe we need to rethink this whole thing about a corporation being an association of persons and having first amendment rights. A lot of people don't like it. (As Melissa speaks, students begin to close their laptops and gather their books. Conversations begin and the professor dismisses the class.)

(**Source:** Based on Sadker & Sadker, 1994.)

Dropping Out of College

LO 13.11 Summarize why students drop out of college.

Not everyone who enters college completes it. Six years after starting college at a four-year institution, only 58 percent have graduated. The picture is even worse for some demographic groups. Only half of Hispanic students graduate in six years (National Center for Education Statistics, 2011).

Why is the college dropout rate so high? There are several reasons. One has to do with finances: Given the high cost of college, many students are unable to afford the continued expense or the strain of juggling the demands of a job and the demands of college. Other people leave college because of changes in their life situations, such as marriage, the birth of a child, or the death of a parent.

Academic difficulties also may play a role. Some students simply find that they are not successful in their studies, and they are either forced by academic authorities to drop out or they leave on their own. However, in most cases students who drop out are not in academic jeopardy (Rotenberg & Morrison, 1993).

College students who drop out in early adulthood—intending to return one day but never making it back because they become enmeshed in the nitty-gritty of everyday life—can experience real difficulties. They may become stuck as young adults in undesirable, low-paying jobs for which they are intellectually overqualified. A college education becomes a lost opportunity.

Yet, dropping out is not always a step backward in a young adult's life path. In some cases, it gives people breathing room to reassess their goals. For instance, students who view the college experience as simply marking time until they can get on with their "real" lives by earning a living can sometimes benefit from a period of full-time work. During the hiatus from college, they often get a different perspective on the realities of both work and school. Other individuals simply benefit by having some time off from school in which to mature socially or psychologically, as we'll discuss further in the next chapter.

Module 13.3 Review

- Rates of college enrollment differ across racial and ethnic lines. The average age of college students is steadily increasing as more adults return to college.
- New students often find the transition to college difficult and experience first-year adjustment reaction. In college, students learn not only a body of knowledge but also a way of understanding the world that generally accepts more viewpoints and sees values in relativistic terms.
- Gender differences in treatment and expectations cause men and women to make different choices and engage in different behaviors in college.
- Most students do not leave college for academic reasons but for financial reasons or because their lives and priorities have changed. Some students who drop out take the time to reassess their goals or to wait until they are socially and psychologically ready to commit themselves to college.

Journal Writing Prompt

Applying Lifespan Development: Do you think that the scenario in Table 13–3 is likely to take place in a university or college in your country? If so, what could be done to encourage educators to treat students with less gender bias?

Epilogue

In this chapter we discussed physical and cognitive development in early adulthood. We looked at overall health and fitness and at intellectual growth, which proceeds through stages that profit from young adults' increasing experience and subtlety. We also examined the college scene, noting demographic trends and differences in treatment and academic performance that affect some groups of college students. We discussed the advantages of college and the adjustment reaction that some first-year college students experience as they encounter the new realities of college life.

Return to the prologue of this chapter, in which we meet Kaneesha Davis, a recent college graduate who is

conflicted about her job in a bank. In light of what you now know about physical and cognitive development in early adulthood, answer the following questions.

1. What lies at the root of Kaneesha's stress? How might a psychoneuroimmunologist describe her situation and the long-term consequences it poses?
2. How did the physical abilities typical of early adulthood save Kaneesha's life? Why might the accident have turned out differently if Kaneesha had been 16 or 46?
3. How could Kaneesha use problem-focused coping to manage her stress? How could she use emotion-focused coping?
4. Kaneesha works at a highly stressful desk job. What diet and exercise routines would you recommend to keep her healthy?

Looking Back

LO 13.1 Describe how the body develops and stays healthy during early adulthood.

The body and the senses generally reach their peak in early adulthood. Health risks are minimal, with accidents presenting the greatest risk of death, followed by AIDS. In the United States, violence is a significant cause of death, particularly among nonwhite segments of the population.

LO 13.2 Explain why a healthy diet is particularly important in early adulthood.

Many young adults begin to put on weight because they fail to change poor eating habits developed earlier, and the percentage of obese adults increases with every year of aging.

LO 13.3 Describe the challenges people with physical disabilities face in early adulthood.

People with physical disabilities face physical and material difficulties as well as psychological difficulties, including prejudice and discrimination.

LO 13.4 Summarize the effects of stress and what can be done about it.

Moderate, occasional stress is biologically healthy, but long exposure to stressors produces damaging physical and psychosomatic effects. In reacting to potentially stressful situations, people pass through primary appraisal of the situation itself and secondary appraisal of their own coping abilities. People cope with stress in a number of healthy and unhealthy ways, including problem-focused coping, emotion-focused coping, social support, and defensive coping.

LO 13.5 Describe how cognitive development continues in young adulthood.

Some theorists find increasing evidence of postformal thought, which goes beyond formal logic to produce more flexible and subjective thinking that takes account of real-world complexity and yields subtler answers than those found during adolescence.

LO 13.6 Compare and contrast Perry's and Schaie's approaches to cognitive development in young adulthood.

To Perry's thinking, cognitive growth in early adulthood involves developing deeper ways of understanding the world, including a progression from dualistic thinking to the realization that it is possible to hold multiple perspectives on issues. According to Schaie, the development of thinking follows a set pattern of stages: the acquisitive stage, the achieving stage, the responsible stage, the executive stage, and the reintegrative stage.

LO 13.7 Explain how intelligence is defined today and how life events cause cognitive growth in young adults.

Traditional views that equated IQ with intelligence are being questioned. According to Sternberg's triarchic theory, intelligence is made up of componential, experiential, and contextual aspects. Practical intelligence seems to be related most closely with career success, and emotional intelligence underlies social interactions and responsiveness to others' needs Creativity often peaks in young adulthood, possibly because young people view problems in novel ways rather than in the familiar ways of their older peers. Important life events, such as births and deaths, seem to contribute to cognitive growth by generating new insights into the self and revised views of the world.

LO 13.8 Describe who attends college today and how the college population is changing.

The profile of the U.S. college student has been changing, with many students beyond the traditional 18- to 22-year-old age range. Compared to white high school graduates, a smaller percentage of African American and Hispanic American high school graduates enter college.

LO 13.9 Summarize what difficulties students face in college.

Many college students, particularly those who experience a decline in status from their high school days, fall victim to

the first-year adjustment reaction—feelings of depression, anxiety, and withdrawal that typically pass quickly as the students integrate themselves into their new surroundings.

LO 13.10 Describe how gender effects the treatment of college students

Gender differences exist in the fields of study chosen by students, students' expectations regarding their future careers and earnings, and professors' treatment of students.

LO 13.11 Summarize why students drop out of college.

Students drop out of college, but usually with the intention of returning at a later time. Reasons for dropping out include academic unreadiness, financial constraints, and changes in life circumstances. Dropping out can provide an opportunity for rethinking priorities.

Key Terms and Concepts

senescence 444
stress 450
psychoneuroimmunology (PNI) 450
primary appraisal 451
secondary appraisal 451
psychosomatic disorders 452
coping 452
defensive coping 453
hardiness 454
postformal thought 456
acquisitive stage 458
achieving stage 459
responsible stage 459
executive stage 459
reintegrative stage 459
triarchic theory of intelligence 460
practical intelligence 461
emotional intelligence 461
creativity 462
first-year adjustment reaction 465

Chapter 14

Social and Personality Development in Early Adulthood

Learning Objectives

LO 14.1 Summarize what makes young adults happy and what is meant by the social clock.

LO 14.2 Explain how young adults respond to the need for intimacy and friendship and how liking turns to loving.

LO 14.3 Differentiate the different kinds of love.

LO 14.4 Describe how young adults choose spouses.

LO 14.5 Explain how infant attachment styles are related to romantic relationships as adults.

LO 14.6 Describe the sorts of relationships people enter into in early adulthood and what makes these relationships work or cease to work.

LO 14.7 Describe how the arrival of children affects a relationship in early adulthood.

LO 14.8 Compare gay and lesbian parents to heterosexual parents.

LO 14.9 Explain why some people choose to remain single in early adulthood.

LO 14.10 Explain the role of careers in the lives of young adults.

LO 14.11 List factors that influence the choice of a career in early adulthood.

LO 14.12 Describe how gender affects work choices and the work environment.

LO 14.13 Explain why people work and what elements of a job bring satisfaction.

Chapter Overview

Prologue: One Size Does Not Fit All

Grace Kennedy is an exuberant 26-year-old who shares an apartment with three other young adults in Brooklyn, New York. When not working at the local food co-op, Grace plays rock violin in two area bands and composes on the piano. Her apartment is often full of musicians, some of them composers like Grace, and the conversation is always lively, alternating between the serious and the humorous with ease. "Music is so rich," Grace says. "It brings people together. It takes them to someplace larger than themselves."

Grace's siblings are all married, including her younger sister, but Grace has had a string of lovers. Her current boyfriend, Jones, plays bass in her retro art-rock band. "Love is wonderful," Grace says. "Jones and I really connect, but who knows if that will last, and I don't see why it needs to." When her sister Kate, who is married with three children, asks her if she ever longs for a home of her own and a family, Grace replies, "I find the idea of shutting myself away in my own little home depressing, like cutting off my limbs. I like living, loving, and working with a variety of people. Society should realize that happiness comes in many shapes." ■

Forming relationships is an important part of early adulthood for many people.

Looking Ahead

Is Grace an example of a young woman who has difficulties with intimacy, or is she part of a larger trend in how women and men in their twenties are approaching the complexities of adulthood?

In either case, early adulthood is a period that poses a variety of developmental tasks (see Table 14-1). During this period, we come to grips with the notion that we are no longer other people's children. We begin to perceive ourselves as adults, as full members of society with significant responsibilities (Arnett, 2000). Many, but not all, of us form romantic relationships that will last, we hope, until the end of our lives.

This chapter examines the challenges of early adulthood, concentrating on the development and course of relationships with others. We will first consider how we establish and maintain love for others, looking at the differences between liking and loving as well as the

Table 14-1 The Developmental Tasks of Adulthood

Adulthood (Ages 20–40)	Middle Adulthood (Ages 40–60)	Late Adulthood (Ages 60+)
• Taking responsibility for yourself • Understanding that you have a unique history and that it is not permanent • Managing the separation from your parents • Redefining the relationship with your parents • Gaining and interpreting your sexual experiences • Becoming capable of intimacy with another (nonfamily) person • Managing money • Developing skills that can lead to a career • Considering career possibilities • Considering parenthood and possibly becoming a parent • Defining your values • Finding a place in society	• Understanding that time is passing and accepting it • Accepting that you are aging • Accepting changes in your body, including appearance and health • Developing an acceptable work identity • Becoming a member of society • Understanding that society is constantly changing • Keeping old friends and making new ones • Coping with changes in your sexuality • Continuously reworking your spousal or partner relationship • Altering your relationship with your children as they age • Passing on knowledge, skills, and values to the next generation • Managing money effectively for short- and long-term goals • Experiencing the illness and death of persons close to you, especially parents • Finding a place in society	• Spending time well • Remaining social rather than isolated • Making friends and new connections • Adjusting to changing sexuality • Staying healthy • Managing physical pain, ailments, and limitations • Making life without work a comfortable lifestyle • Using time wisely for engaging work and recreation • Managing finances effectively for yourself and your dependents • Focusing on the present and future, not dwelling on the past • Adjusting to ongoing losses of close connections • Accepting care from children and grandchildren

(**Source:** Based on Colarusso & Nemiroff, 1981.)

different types of love. In doing so, we will examine how people choose partners and how their choices are influenced by societal and cultural factors.

Close relationships are a major preoccupation for most young adults. We will examine the choice of whether to marry and the factors that influence the course and success of marriage. We will also consider how having a child influences a couple's happiness and the kinds of roles children play within a marriage. Families today come in all shapes and sizes, representing the complexity of relationships that are the staff of life for most people during early adulthood.

Careers are another preoccupation of young adulthood. We will see how identity during early adulthood is often tied to one's job and how people decide on the kind of work they wish to do. The chapter ends with a discussion of the reasons people work—not only to earn money—and how people go about choosing a career.

Forging Relationships: Intimacy, Liking, and Loving during Early Adulthood

Dianne Maher swept Thad Ramon off his feet—literally. "I was setting up the cafeteria for a dance and she was sweeping the floor. Next thing I knew a push broom was under my heels and down I went. I didn't hurt myself or anything, and my pride wasn't injured, but you could say my heart took a beating. There she was, sly grin on her face, and all I could do was stare and laugh. We started talking and laughing some more and soon we discovered we had a lot more than silliness in common. We've been together ever since."

Thad followed his heart and in senior year of college publicly proposed to Dianne in that same cafeteria. They plan to get married beside the college duck pond and at the end of the ceremony march beneath crossed push brooms held by their ushers and bridesmaids.

Not everyone falls in love quite as easily as Dianne and Thad. For some, the road to love is tortuous, meandering through soured relationships and fallen dreams; for others, it is a road never taken. For some, love leads to marriage and a life befitting society's storybook view of home, children, and long years together as a couple. For many, it leads to a less happy ending, prematurely concluding in divorce and custody battles.

Intimacy and forming relationships are major considerations during early adulthood. Young adults' happiness stems, in part, from their relationships, and many worry

about whether they are developing serious relationships "on time." Even those who are not interested in forming a long-term relationship typically are focused, to some extent, on connecting with others.

The Components of Happiness: Fulfilling Psychological Needs

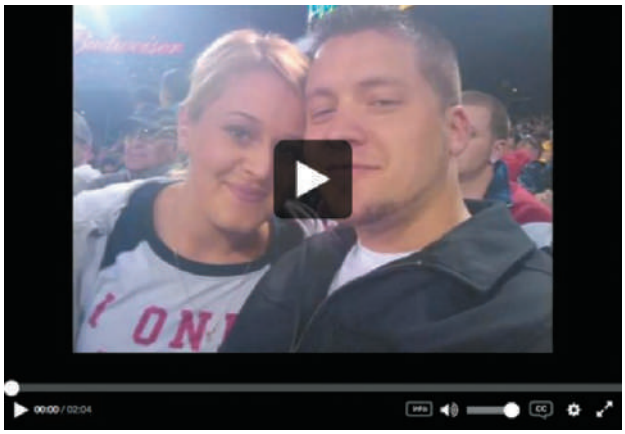
LO 14.1 Summarize what makes young adults happy and what is meant by the social clock.

Think back over the last seven days of your life. What made you happiest? According to research on young adults, it probably wasn't money or material objects that brought you happiness. Instead, happiness usually is derived from feelings of independence, competence, self-esteem, or relating well to other people (Bergsma & Ardelt, 2012; Bojanowska & Zalewska, 2015).

If you ask young adults to recall a time when they were happy, they are most likely to mention an experience or moment when they felt their psychological needs rather than material needs had been satisfied. Being chosen for a new job, developing a deep relationship, or moving into their own apartment or home are examples of the kinds of experiences that might be recalled. Conversely, when they remember times when they were least satisfied, they mention incidents in which basic psychological needs were left unfulfilled.

It's interesting to compare these findings, based on research in the United States, with studies conducted in Asian countries. For example, young adults in Korea more often associate satisfaction with experiences involving other people, whereas young adults in the United States experienced satisfaction from experiences relating to the self and self-esteem. Apparently, culture influences which psychological needs are most important in determining happiness (Sedikides, Gaertner, & Toguchi, 2003; Jongudomkarn & Camfield, 2006; Demir et al., 2012).

WATCH THIS VIDEO ON MYPSYCHLAB YOUNG ADULTHOOD: HAPPINESS, PHIL



THE SOCIAL CLOCKS OF ADULTHOOD. Having children. Receiving a promotion. Getting divorced. Changing jobs. Becoming a grandparent. Each of these events marks a moment on what has been called the social clock of life.

The **social clock** is a term used to describe the psychological timepiece that records the major milestones in people's lives. Each of us has such a social clock that provides us with a sense of whether we have reached the major benchmarks of life early, late, or right on time in comparison to our peers. Our social clocks are culturally determined: They reflect the expectations of the society in which we live.

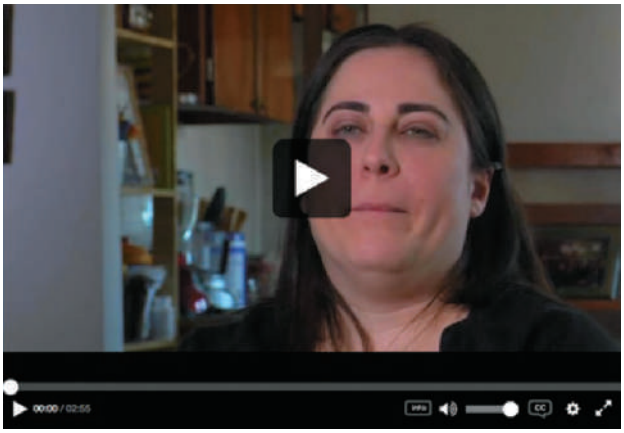
social clock
the culturally determined psychological timepiece providing a sense of whether we have reached the major benchmarks of life at the appropriate time in comparison to our peers

Until the middle of the twentieth century, the social clocks of adulthood were fairly uniform—at least for upper-class and middle-class people in Western society. Most people moved through a series of developmental stages closely aligned with particular ages. For example, the typical man completed his education by his early 20s, started a career, married in his mid-twenties, and was working to provide for a growing family by the time he was in his 30s. Women also followed a set pattern, which focused on getting married and raising children—but not, in most cases, entering a profession and developing a career.

Today, there is considerably more heterogeneity in the social clocks of both men and women. The timing at which major life events occur has changed considerably. Furthermore, as we consider next, women's social clocks have changed dramatically as a result of social and cultural changes.

WOMEN'S SOCIAL CLOCKS. Developmental psychologist Ravenna Helson and colleagues suggest that people have several social clocks from which to choose, and the selection they make has substantial implications for personality development during

WATCH THIS VIDEO ON MYPSYCHLAB YOUNG ADULTHOOD: HAPPINESS, GABI



middle adulthood. Focusing on a sample of women who graduated from college during the early 1960s, Helson's longitudinal research has examined women whose social clocks were focused either on their families, on careers, or on a more individualistic target (Helson & Moane, 1987).

Helson found several broad patterns. Over the course of the study, which assessed participants at the ages of 21, 27, and 43, the women generally became more self-disciplined and committed to their duties. They also felt greater independence and confidence, and they were able to cope with stress and adversity more effectively. Finding a spouse and embarking on a journey toward motherhood meant that many women exhibited what Helson called traditional feminine behavior from about age 21 to 27. But as children grew up and maternal duties diminished, women took on less traditional roles. The study also found some intriguing similarities in personality development in women who chose to focus on family compared with those who focused on career. Both groups tended to show generally positive changes. In contrast, women who had no strong focus on either family or career tended to show either little change or more negative shifts in personality development, such as becoming less satisfied over time.

Helson's conclusion is that the particular social clock that a woman chooses may not be the critical factor in determining the course of personality development. Instead, the process of choosing a particular social clock may be important in producing growth, whether that social clock involves motherhood or a career path. It is less important whether a woman chooses to first develop a career and then embark toward motherhood, or chooses the opposite pattern, or follows some other path entirely. What is more critical is investing in and focusing on a particular trajectory.

It is important to keep in mind that social clocks are culturally determined. The timing of motherhood and the type and course of a woman's career are both influenced by the social, economic, and cultural worlds in which the woman lives (Helson, Stewart, & Ostrove, 1995; Stewart & Ostrove, 1998).

Intimacy, Friendship, and Love

LO 14.2 Explain how young adults respond to the need for intimacy and friendship and how liking turns to loving.

Despite ongoing changes in the nature of women's (and men's) social clocks, one aspect of adulthood still remains a central feature: the development and maintenance of relationships with others. As we consider next, those relationships are a key part of development during early adulthood.

SEEKING INTIMACY: ERIKSON'S VIEW OF YOUNG ADULTHOOD. Erik Erikson regarded young adulthood as the time of the **intimacy-versus-isolation stage**, which spans the period of postadolescence into the early 30s. During this period, the focus is on developing close, intimate relationships with others.

intimacy-versus-isolation stage according to Erikson, the period from postadolescence into the early 30s that focuses on developing close relationships with others

Erikson's idea of intimacy comprises several aspects. One is a degree of selflessness, involving the sacrifice of one's own needs to those of another. A further component involves sexuality, the experience of joint pleasure from focusing not just on one's own gratification but also on that of one's partner. Finally, there is deep devotion, marked by efforts to fuse one's identity with the identity of a partner.

According to Erikson, those who experience difficulties during this stage are often lonely, isolated, and fearful of relationships with others. Their difficulties may stem from an earlier failure to develop a strong identity. In contrast, young adults who are able to form intimate relationships with others on a physical, intellectual, and emotional level successfully resolve the crisis posed by this stage of development.

From Research to Practice

Emerging Adulthood: Not Quite There Yet!

Do you feel as though you're not really an "adult," despite having reached an age where you are legally an adult? Are you still unsure of who you are and what you want to do with your life, and feeling unready to go out in the world on your own? If so, what you're experiencing is a developmental period known as *emerging adulthood—a* transitional stage between adolescence and adulthood that spans the third decade of life. Researchers are increasingly considering emerging adulthood to be a distinct developmental period during which the brain is still growing and modifying its neural pathways. It's typically a time of uncertainty and self-discovery during which the emerging adult is still figuring out the world and his or her place in it (Arnett, 2014a).

Emerging adulthood is marked by five features. *Identity exploration* entails learning to make important decisions about love, work, and one's core beliefs and values. In a Clark University survey of over 1,000 diverse emerging adults age 18 to 29 throughout the United States, 77 percent agreed with the statement "This is a time of life for finding out who I really am." Another feature of emerging adulthood is *instability*, which can be represented as changes in life plans or goals, fluctuating career and educational paths, rocky relationships, and even shifts in ideologies. In the Clark poll, 83 percent of respondents agreed that "This time of my life is full of changes" (Arnett, 2014b).

A third feature of emerging adulthood is *self-focus*: It's a time of life that comes between parental control and the obligations of child-raising and career. With fewer people to answer to, emerging adults enjoy the luxury of focusing on themselves for a while before making any serious commitments. "This is a time of my life for focusing on myself" was a statement with which 71 percent of respondents to the Clark poll agreed. Given all this, it's probably not surprising that a fourth feature of emerging adulthood is *feeling in-between*, a sense of being no longer an adolescent but not yet really an adult either. For some emerging adults the feeling is enhanced by remaining dependent in some ways on their parents, and for others it's more a sense of uncertainty and hesitation in accepting full adulthood just yet. Half of the respondents to the Clark poll were unwilling to agree completely that they had reached adulthood (Arnett, 2014b).

Finally, despite the stress and anxiety that are associated with the uncertainties of emerging adulthood, it is also a time of *optimism*. Nearly 90 percent of Clark poll respondents agreed that "I am confident that someday I will get what I want out of life" and 83 percent agreed "At this time of my life, anything is possible." Part of the reason for this optimism is the tendency for young adults today to be better educated than their parents were, such that their optimism has a basis in reality. And happily, by the time they are 30, most emerging adults have found their way and have settled more comfortably into their adult roles (Arnett, 2014b, 2015).

Shared Writing Prompt

Do you think emerging adulthood is truly a universal life stage, or do you think it is a luxury enjoyed only by young adults who are more privileged? Why do you feel this way?

Although Erikson's approach has been influential, some aspects of his theory trouble today's developmentalists. For instance, Erikson's view of healthy intimacy was limited to adult heterosexuality, the goal of which was to produce children. Consequently, homosexual partnerships, couples who were childless by choice, and other relationships that deviated from what Erikson saw as the ideal were thought of as less than satisfactory. Furthermore, Erikson focused more on men's development than on women's and did not consider racial and ethnic identity, thereby greatly limiting the applicability of his theory (Yip, Sellers, & Seaton, 2006).

Still, Erikson's work has been influential historically because of its emphasis on examining the continued growth and development of personality throughout the life span. Furthermore, it inspired other developmentalists to consider psychosocial growth during young adulthood and the range of intimate relationships we develop, from friendship to mates for life (Whitbourne, Sneed, & Sayer, 2009). For example, some developmentalists believe there is a unique developmental stage that begins at the end of the teenage years and extends through the early 20s (also see the *From Research to Practice* box).

emerging adulthood
the period from the late teenage years extending to the mid-twenties in which people are still sorting out their options for the future

FRIENDSHIP. Most of our relationships with others involve friends, and for most people maintaining such relationships is an important part of adult life. Why? One reason is that there is a basic *need for belongingness* that leads people in early adulthood to establish and maintain at least a minimum number of relationships with others. Most people are driven toward forming and preserving relationships that allow them to experience a sense of belonging with others (Manstead, 1997; Rice, 1999).

But how do particular people end up becoming our friends? One of the most important reasons is simple proximity—people form friendships with others who live nearby

People are most attracted to those who can keep confidences and are loyal, warm, and affectionate.

and with whom they come in contact most frequently. Because of their accessibility, people who are in close proximity can obtain rewards of friendship, such as companionship, social approval, and the occasional helping hand, at relatively little cost.

Similarity also plays an important role in friendship formation. Birds of a feather *do* flock together: People are more attracted to others who hold attitudes and values similar to their own (Selfhout et al., 2009; Preciado et al., 2012; Mikulincer et al., 2015).

The importance of similarity becomes particularly evident when we consider cross-race friendships. By the time of adolescence, the number of cross-race close friendships dwindles, a pattern that continues throughout the remainder of the life span. In fact, although most adults claim on surveys to have a close friend of a different race, when they are queried regarding the names of close friends, few include a person of a different race.

We also choose friends on the basis of their personal qualities. What's most important? People are most attracted to others who keep confidences and are loyal, warm, and affectionate. In addition, we like those who are supportive, helpful, and provide a sense of security (Hartup & Stevens, 1999; You & Bellmore, 2012).

Defining the Indefinable: What Is Love?

LO 14.3 Differentiate the different kinds of love.

> *After a few chance encounters at the laundromat where they wash their clothes each week, Rebecca and Jerry begin to talk with one another. They find they have a lot in common, and they begin to look forward to what are now semi-planned meetings. After several weeks, they go out on their first official date and discover that they are well suited to each other.*

If such a pattern seems predictable, it is: Most relationships develop in a fairly similar way, following a surprisingly regular progression (Burgess & Huston, 1979; Berscheid, 1985):

- Two people interact with each other more often and for longer periods of time. Furthermore, the range of settings increases.
- The two people increasingly seek out each other's company.
- They open up to each other more and more, disclosing more intimate information about themselves. They begin to share physical intimacies.
- The couple is more willing to share both positive and negative feelings, and they may offer criticism in addition to praise.
- They begin to agree on the goals they hold for the relationship.
- Their reactions to situations become more similar.
- They begin to feel that their own psychological well-being is tied to the success of the relationship, viewing it as unique, irreplaceable, and cherished.
- Finally, their definition of themselves and their behavior changes: They begin to see themselves and act as a couple rather than as two separate individuals.

Is the "love" that Rebecca and Jerry are feeling just a lot of "liking"? Most developmental psychologists would answer negatively; love not only differs quantitatively from liking, it represents a qualitatively different state. For example, love, at least in its early stages, involves relatively intense physiological arousal, an all-encompassing interest in another individual, recurrent fantasies about the other individual, and rapid swings of emotion

(Lamm & Wiesmann, 1997). As distinct from liking, love includes elements of closeness, passion, and exclusivity (Walster & Walster, 1978; Hendrick & Hendrick, 2003).

Not all love is the same, of course. We don't love our mothers the same way we love girlfriends or boyfriends, brothers or sisters, or lifelong friends. What distinguishes these different types of love? Some psychologists suggest that our love relationships can fall into two different categories: passionate or companionate.

PASSIONATE AND COMPANIONATE LOVE: THE TWO FACES OF LOVE. **Passionate (or romantic) love** is a state of powerful absorption in someone. It includes intense physiological interest and arousal, and caring for another's needs. In comparison, **companionate love** is the strong affection that we have for those with whom our lives are deeply involved (Hendrick & Hendrick, 2003; Barsade & O'Neill, 2014).

passionate (or romantic) love
a state of powerful absorption in someone

companionate love
the strong affection for those with whom our lives are deeply involved

What is it that fuels the fires of passionate love? According to one theory, anything that produces strong emotions—even negative ones, such as jealousy, anger, or fear of rejection—may be the source of deepening passionate love.

In psychologists Elaine Hatfield and Ellen Berscheid's **labeling theory of passionate love**, individuals experience romantic love when two events occur together: intense physiological arousal and situational cues that indicated that "love" is the appropriate label for the feelings they are experiencing (Berscheid & Walster, 1974a). The physiological arousal can be produced by sexual arousal, excitement, or even negative emotions such as jealousy. Whatever the cause, if that arousal is subsequently labeled as "I must be falling in love" or "she makes my heart flutter" or "he really turns me on," then the experience is attributed to passionate love.

labeling theory of passionate love
the theory that individuals experience romantic love when two events occur together: intense physiological arousal and situational cues suggesting that the arousal is due to love

The theory is particularly useful in explaining why people may feel deepened love even when they experience continual rejection or hurt from their assumed lover. It suggests that such negative emotions can produce strong physiological arousal. If this arousal is interpreted as being caused by "love," then people may decide that they are even more in love than they were before they experienced the negative emotions.

But why should people label an emotional experience as "love" when there are so many possible alternatives? One answer is that in Western cultures, romantic love is seen as possible, acceptable, desirable—an experience to be sought. The virtues of passion are extolled in love ballads, commercials, television shows, and films. Consequently, young adults are primed and ready to experience love in their lives (Dion & Dion, 1988; Hatfield & Rapson, 1993; Florsheim, 2003).

It is interesting to note that this is not the way it is in every culture. For instance, in many cultures, passionate, romantic love is a foreign concept. Marriages may be arranged on the basis of economic and status considerations. Even in Western cultures, the concept of love is of relatively recent origin. For instance, the notion that couples need to be in love was not "invented" until the Middle Ages, when social philosophers first suggested that love ought to be a requirement for marriage. Their goal in making such a proposal: to provide an alternative to the raw sexual desire that had served as the primary basis for marriage before (Xiaohe & Whyte, 1990; Haslett, 2004; Moore & Wei, 2012).

STERNBERG'S TRIANGULAR THEORY: THE THREE FACES OF LOVE. To psychologist Robert Sternberg, love is more complex than a simple division into passionate and companionate types. He suggests instead that love is made up of three components: intimacy, passion, and decision/commitment. The **intimacy component** encompasses feelings of closeness, affection, and connectedness. The **passion component** comprises the motivational drives relating to sex, physical closeness, and romance. This component is exemplified by intense, physiologically arousing feelings of attraction. Finally, the third aspect of love, the **decision/commitment component**, embodies both the initial cognition that one loves another person and the longer-term determination to maintain that love (Sternberg, 1986, 1988, 1997b).

intimacy component
the component of love that encompasses feelings of closeness, affection, and connectedness

passion component
the component of love that comprises the motivational drives relating to sex, physical closeness, and romance

decision/commitment component
the third aspect of love that embodies both the initial cognition that one loves another person and the longer-term determination to maintain that love

These components can be combined to form eight different types of love depending on which of the three components is either present or missing from a relationship (see Table

Table 14-2 The Combinations of Love

	Component			
Type of Love	**Intimacy**	**Passion**	**Decision/Commitment**	**Example**
Nonlove	Absent	Absent	Absent	The way you might feel about the person who takes your ticket at the movies
Liking	Present	Absent	Absent	Good friends who have lunch together at least once or twice a week
Infatuated love	Absent	Present	Absent	A "fling" or short-term relationship based only on sexual attraction
Empty love	Absent	Absent	Present	An arranged marriage or a couple who have decided to stay married "for the sake of the children"
Romantic love	Present	Present	Absent	A couple who have been happily dating a few months, but have not made any plans for a future together
Companionate love	Present	Absent	Present	A couple who enjoy each other's company and their relationship, although they no longer feel much sexual interest in each other
Fatuous love	Absent	Present	Present	A couple who decides to move in together after knowing each other for only two weeks
Consummate love	Present	Present	Present	A loving, sexually vibrant, long-term relationship

14-2). For instance, *nonlove* refers to people who have only the most casual of relationships; it consists of the absence of the three components of intimacy, passion, and decision/commitment. *Liking* develops when only intimacy is present; *infatuated love* exists when only passion is felt; and *empty love* exists when only decision/commitment is present.

Other types of love involve a mix of two or more components. For instance, romantic love occurs when intimacy and passion are present, and *companionate love* when intimacy and decision/commitment occur jointly. When two people experience *romantic love*, they are drawn together physically and emotionally, but they do not necessarily view the relationship as lasting. Companionate love, on the other hand, may occur in long-lasting relationships in which physical passion has taken a back seat.

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TRIANGULAR THEORY OF LOVE: ROBERT STERNBERG

Fatuous love exists when passion and decision/commitment, without intimacy, are present. Fatuous love is a kind of mindless loving in which there is no emotional bond between the partners.

Finally, the eighth kind of love is *consummate love.* In consummate love, all three components of love are present. Although we might assume that consummate love represents the "ideal" love, such a view may well be mistaken. Many long-lasting and entirely satisfactory relationships are based on types of love other than consummate love. Furthermore, the type of love that predominates in a relationship varies over time. As shown in Figure 14-1, in strong, loving relationships the level of decision/commitment peaks and remains fairly stable. By contrast, passion tends to peak early in a relationship but then declines and levels off. Intimacy also increases fairly rapidly but can continue to grow over time.

Sternberg's triangular theory of love emphasizes both the complexity of love and its dynamic, evolving quality. As people and relationships develop and change over time, so does their love.

Choosing a Partner: Recognizing Mr. or Ms. Right

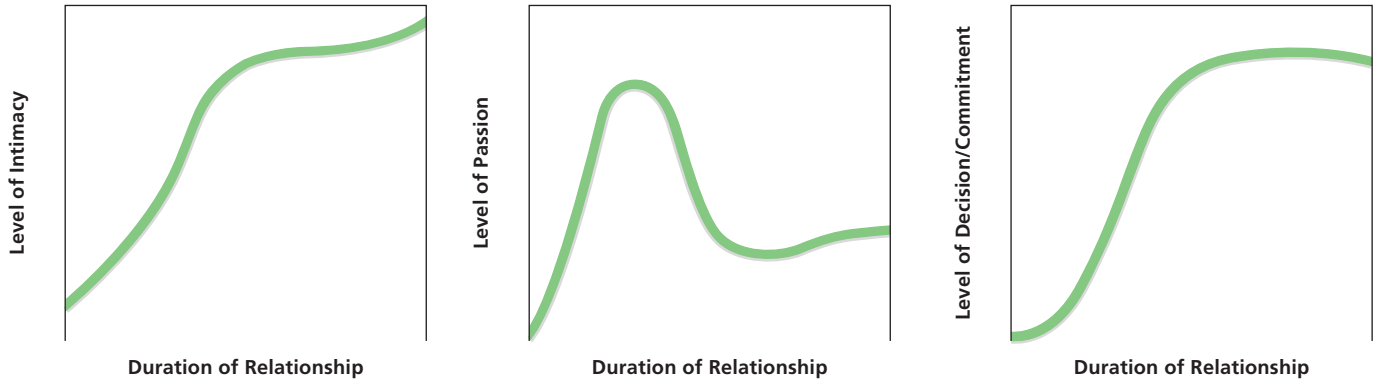
LO 14.4 Describe how young adults choose spouses.

For many young adults, the search for a partner is a major pursuit during early adulthood. Certainly society offers a great deal of advice on how to succeed in this endeavor, as a glance at the array of magazines at any supermarket checkout counter confirms.

Figure 14-1 The Shape of Love

Over the course of a relationship, the three aspects of love—intimacy, passion, and decision/commitment—vary in strength. How do these change as a relationship develops?

(**Source:** Sternberg, 1986.)



Despite all the counsel, the road to identifying an individual to share one's life is not always easy.

SEEKING A SPOUSE: IS LOVE THE ONLY THING THAT MATTERS? Most people have no hesitation in articulating that the major factor in choosing a husband or wife is love. Most people in the United States, that is: If we ask people in other societies, love becomes a secondary consideration. For instance, consider the results of a survey in which college students were asked if they would marry someone they did not love. On one hand, hardly anyone in the United States, Japan, or Brazil would consider it. On the other hand, a goodly proportion of college students in Pakistan and India would find it acceptable to marry without love (Levine, 1993).

If love is not the only important factor, what else matters? The characteristics differ considerably from one culture to another. For instance, a survey of nearly 10,000 people from around the world found that although people in the United States believed that love and mutual attraction were the primary characteristics, in China men ranked good health most important and women rated emotional stability and maturity most critical. In contrast, in South Africa men from a Zulu background rated emotional stability first, and Zulu women rated dependable character as being of greatest concern (Buss et al., 1990; Buss, 2003).

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ARRANGED MARRIAGE: RATI AND SUBAS, 20'S

Yet there are commonalities across cultures. For instance, love and mutual attraction, even if not at the top of a specific culture's list, were highly desired across all cultures. Furthermore, traits such as dependability, emotional stability, pleasing disposition, and intelligence were highly valued almost universally.

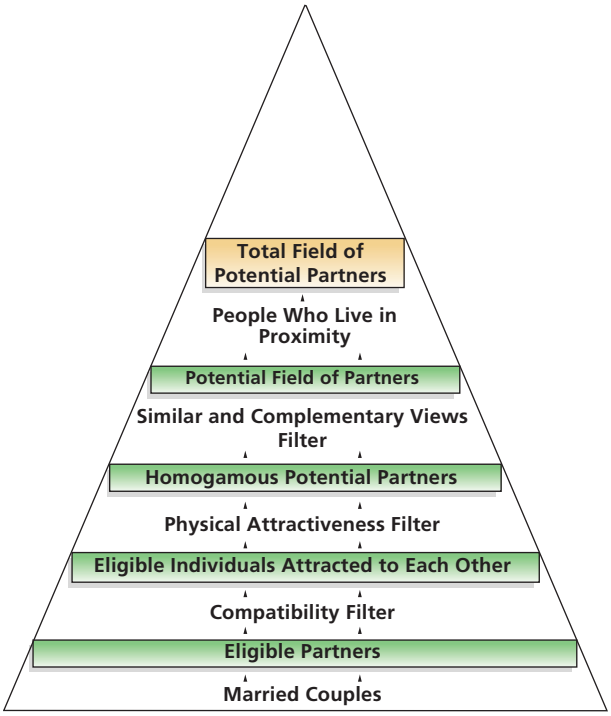
Certain gender differences in the preferred characteristics of a mate were similar across cultures—findings that have been confirmed by other surveys (e.g., Sprecher, Sullivan, & Hatfield, 1994). Men, more than women, prefer a potential marriage partner who is physically attractive. In contrast, women, more than men, prefer a potential spouse who is ambitious and industrious.

One explanation for cross-cultural similarities in gender differences rests on evolutionary factors. According to psychologist David Buss and colleagues (Buss, 2004; Buss & Shackelford, 2008), human beings, as a species, seek out certain characteristics in their mates that are likely to maximize the availability of beneficial genes. He argues that males in particular are genetically programmed to seek out mates with traits that indicate they have high reproductive capacity. Consequently, physically attractive, younger women might be more desirable since they are more capable of having children over a longer time period.

Figure 14-2 Filtering Potential Marriage Partners

According to one approach, we screen potential mates through successively finer-grained filters in order to settle on an appropriate spouse.

(**Source:** Based on Janda & Klenke-Hamel, 1980.)



In contrast, women are genetically programmed to seek out men who have the potential to provide scarce resources in order to increase the likelihood that their offspring will survive. Consequently, they are attracted to mates who offer the highest potential of providing economic well-being (Walter, 1997; Kasser & Sharma, 1999; Li et al., 2002).

The evolutionary explanation for gender differences has come under heavy fire from critics. First, there is the problem that the explanation is untestable. Furthermore, the similarities across cultures relating to different gender preferences may simply reflect similar patterns of gender stereotyping that have nothing to do with evolution. In addition, although some of the gender differences in what men and women prefer are consistent across cultures, there are numerous inconsistencies as well.

Finally, some critics of the evolutionary approach suggest that finding that women prefer a partner who has good earning potential may have nothing to do with evolution and everything to do with the fact that men generally hold more power, status, and other resources fairly consistently across different cultures. Consequently, it is a rational choice for women to prefer a high-earning-potential spouse. On the other hand, because men don't need to take economic considerations into account, they can use more inconsequential criteria—like physical attractiveness—in choosing a spouse. In short, the consistencies that are found across cultures may be due to the realities of economic life that are similar throughout different cultures (Eagly & Wood, 2003).

FILTERING MODELS: SIFTING OUT A SPOUSE. Although surveys assist in identifying the characteristics that are highly valued in a potential spouse, they are less helpful in determining how a specific individual is chosen as a partner. One approach that helps explain this is the filtering model developed by psychologists Louis Janda and Karen Klenke-Hamel (1980). They suggest that people seeking a mate screen potential candidates through successively finer-grained filters, just as we sift flour in order to remove undesirable material (see Figure 14-2).

The model assumes that people first filter for factors relating to broad determinants of attractiveness. Once these early screens have done their work, more sophisticated types of screening are used. The end result is a choice based on compatibility between the two individuals.

What determines compatibility? It is not only a matter of pleasing personality characteristics; several cultural factors also play an important role. For instance, people often marry according to the principle of homogamy. **Homogamy** is the tendency to marry someone who is similar in age, race, education, religion, and other basic demographic characteristics. Homogamy has traditionally been the dominant standard for most marriages in the United States.

homogamy
the tendency to marry someone who is similar in age, race, education, religion, and other basic demographic characteristics

From *a social worker's* perspective

How do the principles of homogamy and the marriage gradient work to limit options for high-status women? How do they affect men's options?

The importance of homogamy is declining, however, particularly among certain ethnic groups. For example, the rate of intermarriage among African American men tripled from 1980 to 2010. Still, for other groups—such as Hispanic and Asian immigrants—the principle of homogamy still has considerable influence (see Figure 14-3; Fu & Heaton, 2008; Wang, 2012; Mu & Xie, 2014).

The marriage gradient represents another societal standard that determines who marries whom. The **marriage gradient** is the tendency for men to marry women who are slightly younger, smaller, and lower in status, and women to marry men who are slightly older, larger, and higher in status (Bernard, 1982).

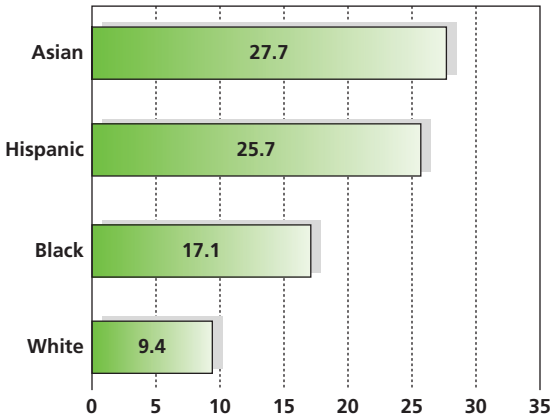
The marriage gradient, which has a powerful influence on marriage in the United States, has important, and unfortunate, effects on partner choice. For one thing, it limits the number of potential mates for women, especially as they age, while allowing men a wider choice of partners as their age increases. Furthermore, some men do not marry because they cannot find women of low enough status to meet the demands of the gradient or cannot find women of the same or higher status who are willing to accept them as mates. Consequently, they are, in the words of sociologist Jessie Bernard (1982), "bottom of the barrel" men. On the other hand, some women will be unable to marry because they are higher in status or seek someone of higher status than anyone in the available pool of men—"cream of the crop" women, in Bernard's words.

The marriage gradient makes finding a spouse particularly difficult for well-educated African American women. Fewer African American men attend college than African American women, making the potential pool of men who are suitable—as defined by society and the marriage gradient—relatively small. Consequently, relative to women of other races, African American women are more apt to marry men who are less educated than they are—or not marry at all (Willie & Reddick, 2003). (Also see the *Developmental Diversity and Your Life box*.)

Figure 14-3 Marriage outside of Racial/Ethnic Group

Although homogamy has been the standard for most marriages in the United States, the rate of marriages crossing ethnic and racial lines is substantial.
(**Source:** Wang/Pew Research Center, 2012.)

Intermarriage Rates, by Race and Ethnicity, 2010
Percent of newlyweds married to someone of a different race/ethnicity



Note: Asians include Pacific Islanders. Whites, blacks, and Asians include only non-Hispanics. Hispanics are of any race.

marriage gradient
the tendency for men to marry women who are slightly younger, smaller, and lower in status, and women to marry men who are slightly older, larger, and higher in status

Attachment Styles and Romantic Relationships: Do Adult Loving Styles Reflect Attachment in Infancy?

LO 14.5 Explain how infant attachment styles are related to romantic relationships as adults.

"I want a girl just like the girl that married dear old Dad." So go the lyrics of an old song, suggesting that the songwriter would like to find someone who loves him as much as his mother did. Is this just a corny tune, or is there a kernel of truth in this sentiment? Put more broadly, is the kind of attachment that people experience during infancy reflected in their adult romantic relationships?

Increasing evidence suggests that it very well may be. As you may recall, attachment refers to the positive emotional bond that develops between a child and a particular individual. Most infants fall into one of three attachment categories: securely attached children, who have healthy, positive, trusting relationships with their caregivers; avoidant infants, who are relatively indifferent to caregivers and who avoid interactions with them; and ambivalent infants, who show great distress when separated from a caregiver but who appear angry upon the caregiver's return.

According to psychologist Phillip Shaver and his colleagues, attachment styles continue into adulthood and affect the nature of romantic relationships (Mikulincer & Shaver, 2007; Dinero et al., 2008; Frías, Shaver, & Mikulincer, 2015). For instance, consider the following statements:

1. I find it relatively easy to get close to others and am comfortable depending on them and having them depend on me. I don't often worry about being abandoned or about someone getting too close to me.
2. I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone

Developmental Diversity and Your Life

Gay and Lesbian Relationships: Men with Men and Women with Women

Most research conducted by developmental psychologists has examined heterosexual relationships, but an increasing number of studies have looked at relationships involving gay men and those involving lesbian women. The findings suggest that gay and lesbian relationships are quite similar to relationships between heterosexuals.

For example, gay men describe successful relationships in ways that are similar to heterosexual couples' descriptions. They believe that successful relationships involve greater appreciation for the partner and the couple as a whole, less conflict, and more positive feelings toward the partner. Similarly, lesbian women in a relationship show high levels of attachment, caring, intimacy, affection, and respect (Beals, Impett, & Peplau, 2002; Kurdek, 2006).

Furthermore, the age preferences expressed in the marriage gradient for heterosexuals also extend to partner preferences for homosexual men. Like heterosexual men, homosexual men prefer partners who are the same age or younger. On the other hand, lesbians' age preferences fall somewhere between those of heterosexual women and heterosexual men (Kenrick et al., 1995).

Finally, despite the stereotype that gay males, in particular, find it difficult to form relationships and are more interested in sexual alliances, the reality is different. Most gays and lesbians seek loving, long-term, and meaningful relationships that differ little qualitatively from those desired by heterosexuals. Although some research suggests that homosexual relationships are less long-lasting than heterosexual relationships, the factors that lead to relationship stability—partners' personality traits, support for the relationship from others, and dependence on the relationship—are similar for homosexual and heterosexual couples (Diamond, 2003; Diamond & Savin-Williams, 2003; Kurdek, 2005, 2008).

Opinions on very few social issues have changed as much as attitudes toward same-sex marriage, which the Supreme Court in 2015 ruled legal in the United States. A majority of Americans support same-sex marriage, a significant shift in sentiment over the last 20 years. Furthermore, there are significant generational differences: whereas two-thirds of people under 30 support same-sex marriage, only 38 percent of those older than 65 support the legalization of gay marriage (Pew Research Center, 2014).

Research finds that the quality of lesbian and gay relationships differs little from that of heterosexual relationships.

gets too close, and often love partners want me to be more intimate than I feel comfortable being.

3. I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to merge completely with another person, and this desire sometimes scares people away (Shaver, Hazan, & Bradshaw, 1988).

According to Shaver's research, agreement with the first statement reflects a secure attachment style. Adults who agree with this statement readily enter into relationships and feel happy, energized, and confident about the future success of their relationships. Most young adults—just over half—display the secure style of attachment (Hazan & Shaver, 1987; Luke, Sedikides, & Carnelley, 2012).

In contrast, adults who agree with the second statement typically display the avoidant attachment style. These individuals, who make up about a quarter of the population, tend to be less invested in relationships, have higher breakup rates, and often feel lonely.

Finally, agreement with the third category is reflective of an ambivalent style. Adults with an ambivalent style have a tendency to become overly invested in relationships, have repeated breakups with the same partner, and have relatively low self-esteem. Around

20 percent of adults, gay and straight, fall into this category (Simpson, 1990; Li & Chan, 2012).

Attachment style is also related to the nature of care that adults give to their romantic partners when they need assistance. For instance, secure adults tend to provide more sensitive and supportive care, being responsive to their partner's psychological needs. In comparison, anxious adults are more likely to provide compulsive, intrusive (and ultimately less helpful) aid to partners (Feeney & Collins, 2003; Gleason, Iida, & Bolger, 2003; Mikulincer & Shaver, 2009).

It seems clear that there are continuities between infants' attachment styles and their behavior as adults. People who are having difficulty in relationships might look back to their infancy to identify the root of their problem (Simpson et al., 2007; Berlin, Cassidy, & Appleyard, 2008; Draper et al., 2008).

Some psychologists believe that our attachment style as infants is repeated in the quality of our intimate relationships as adults.

Module 14.1 Review

- Happiness in young adulthood is derived from the fulfillment of psychological rather than material needs. The social clock refers to the timing of major life events. Although people's lives are more heterogeneous than in previous eras, the ticking of the social clock becomes louder in middle adulthood than in other periods, particularly for women.
- According to Erikson, young adults are in the intimacy-versus-isolation stage. The course of relationships typically follows a pattern of increasing interaction, intimacy, and redefinition.
- According to the labeling theory of passionate love, people experience love when intense physiological arousal is accompanied by situational cues that the experience should be labeled "love." Types of love include passionate and companionate love. Sternberg's triangular theory identifies three basic components (intimacy, passion, and decision/commitment).
- In many Western cultures, love is the most important factor in selecting a partner. According to filtering models, people apply increasingly fine filters to potential partners, eventually choosing a mate according to the principles of homogamy and the marriage gradient. In general, the nature of relationships in heterosexual, gay, and lesbian couples are more similar than different.
- Attachment styles in infants appear to be linked to the ability to form romantic relationships in adulthood.

Journal Writing Prompt

Applying Lifespan Development: Consider a long-term marriage with which you are familiar. Do you think the relationship involves passionate love or companionate love (or both)? What changes when a relationship moves from passionate to companionate love? From companionate to passionate love? In which direction is it more difficult for a relationship to move? Why?

The Course of Relationships

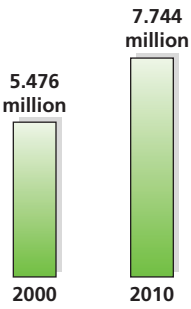
> *He wasn't being a chauvinist or anything, expecting me to do everything and him nothing. He just didn't volunteer to do things that obviously needed doing, so I had to put down some ground rules. Like if I'm in a bad mood, I may just yell: "I work eight hours just like you. This is half your house and half your child, too. You've got to do your share!" Jackson never changed the kitty litter box once in four years, but he changes it now, so we've made great progress. I just didn't expect it to take so much work. We planned this child together and we went through Lamaze together, and Jackson stayed home for the first two weeks. But then—wham—the partnership was over. (Cowan & Cowan, 1992, p. 63)*

Relationships, like the individuals who make them up, face a variety of challenges. As men and women move through early adulthood, they encounter significant changes in their lives as they work at starting and building their careers, having children, and establishing, maintaining, and sometimes ending relationships with others. One of the primary questions young adults face is whether and when to marry.

Figure 14-4 Cohabitation

The number of couples living together prior to marriage increased by 41 percent from the year 2000 to 2010.

(**Source:** U.S. Bureau of the Census, 2010.)



cohabitation

couples living together without being married

Cohabitation, Marriage, and Other Relationship Choices: Sorting Out the Options of Early Adulthood

LO 14.6 Describe the sorts of relationships people enter into in early adulthood and what makes these relationships work or cease to work.

For some people, the primary issue is not identifying a potential spouse but whether to marry at all. Although surveys show that most heterosexuals (and a growing number of gays and lesbians) say they want to get married, a significant number choose some other route. For instance, the past half century has seen both a decline in the number of married couples and a huge, 1,500 percent rise in couples living together without being married, a status known as **cohabitation**. In fact, today, some 7.5 million people are cohabiting in the United States (see Figure 14-4). Married couples now make up a minority of households (Doyle, 2004b; Roberts, 2006; Jay, 2012).

Most young adults will live with a romantic partner for at least one period of time during their 20s. Furthermore, most marriages today occur after a period in which the couple has cohabited. Why do so many couples choose to cohabit rather than to marry? Some feel they are not ready to make a lifelong commitment. Others feel that cohabitation provides "practice" for marriage. (This is more likely for women than men. Women tend to see cohabitation as a step toward marriage; men are more likely to view it as a way to test a relationship; Jay, 2012).

Some couples cohabitate because they reject the institution of marriage altogether, maintaining that marriage is outmoded and that it is unrealistic to expect a couple to spend a lifetime together (Martin, Martin, & Martin, 2001; Guzzo, 2009; Miller, Sassler, & Kus-Appough, 2011).

Statistics suggest that those who feel that cohabiting increases their subsequent chances of a happy marriage are incorrect. On the contrary, the chances of divorce are somewhat higher for those who have previously cohabited, according to data collected in both the United States and Western Europe (Hohmann-Marriott, 2006; Rhoades, Stanley, & Markman, 2006, 2009; Tang, Curran, & Arroyo, 2014).

MARRIAGE. Despite the prevalence of cohabitation, marriage ultimately remains the preferred alternative for most people during early adulthood. Many see marriage as the appropriate culmination of a loving relationship, while others feel it is the "right" thing to do after reaching a particular age in early adulthood. Others seek marriage because of the various roles that a spouse can fill. For instance, a spouse can play an economic role, providing security and financial well-being. Spouses also fill a sexual role, offering a means of sexual gratification and fulfillment that is fully accepted by society. Another role is therapeutic and recreational: Spouses provide a sounding board to discuss one another's problems and act as partners for activities. Marriage also offers the only means of having children that is fully accepted by all segments of society. Finally, marriage offers legal benefits and protections, such as being eligible for medical insurance under a spouse's policy and eligibility for survivor benefits, such as Social Security benefits (Furstenberg, 1996).

Although marriage remains important, it is not a static institution. For example, fewer U.S. citizens are now married than at any time since the late 1890s. Part of this decline in marriage is attributable to higher divorce rates, but the decision of people to marry later in life is also a contributing factor. The median age of first marriage in the United States is now 28.7 for men and 26.5 for women—the oldest age for women since national statistics were first collected in the 1880s (see Figure 14-5; U.S. Bureau of the Census, 2010).

In many European countries, legal alternatives to marriage are growing. For instance, France offers "civil solidarity pacts," in which couples receive many of the same legal rights as married couples. What differs is that there is no legal lifetime commitment that they would be asked to make if they married; civil solidarity pacts can be dissolved more easily than marriages (Lyall, 2004).

Does this mean that marriage is losing its viability as a social institution? Probably not. Most people eventually do marry, and national polls find that almost everyone endorses the notion that a good family life is important (Newport & Wilke, 2013).

Why are people getting married later in life? The delay in part reflects economic concerns and the commitment to establishing a career. Choosing and starting a career presents an increasingly difficult series of decisions for young adults, and some feel that until they get a foothold on a career path and begin to earn an adequate salary, marriage plans should be put on hold (Dreman, 1997).

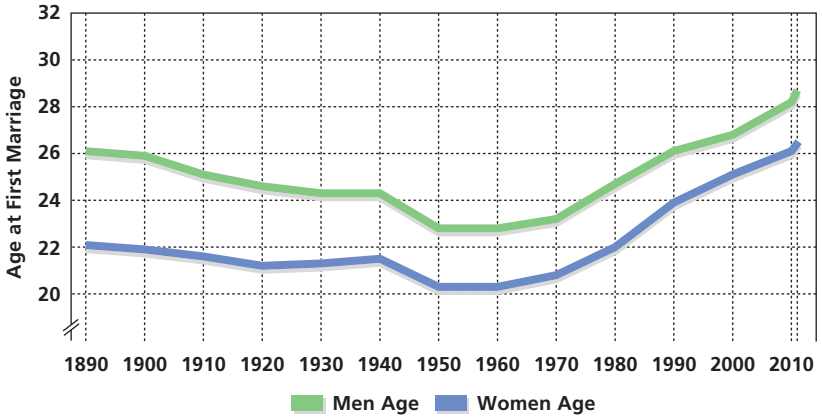
From *a social worker's* perspective

Why do you think society has established such a powerful norm in favor of marriage? What effects might such a norm have on a person who prefers to remain single?

Figure 14-5 Postponing Marriage

The age at which women and men first marry is the highest since national statistics were first collected in the late 1800s. What factors account for this?

(**Source:** U.S. Bureau of the Census, 2011.)



WHAT MAKES MARRIAGES WORK? Partners in successful marriages display several characteristics. They visibly show affection to one another, and they communicate relatively little negativity. Happily married couples tend to perceive themselves as part of an interdependent couple rather than as one of two independent individuals. They also experience social homogamy, a similarity in leisure activity and role preferences. They hold similar interests, and they agree on a distribution of roles—such as who takes out the garbage and who takes care of the children (Carrere et al., 2000; Huston et al., 2001; Stutzer & Frey, 2006; Cordova, 2014).

Our awareness of the characteristics displayed by husbands and wives in successful marriages has not, however, helped prevent what can only be called an epidemic of divorce. The statistics on divorce are grim: Only about half of all marriages in the United States remain intact. Over a million marriages end in divorce each year, and there are 4.2 divorces for every 1,000 individuals. This figure actually represents a decline from the peak in the mid-1970s of 5.3 divorces per 1,000 people, and most experts think that the rate is leveling off (National Center for Health Statistics, 2001).

WATCH THIS VIDEO ON MYPSYCHLAB LOVE

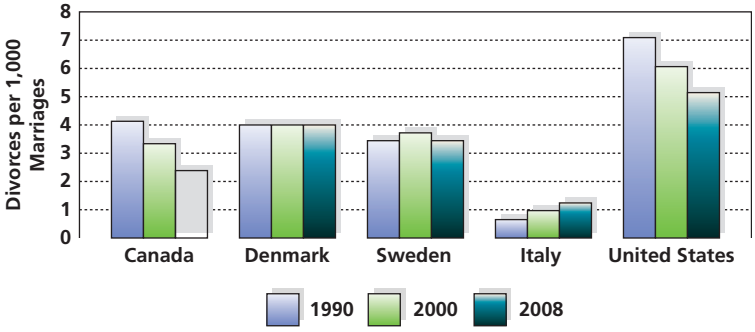
MARRIAGE: SCHERAZADE AND RODERICK, LATE 30'S

Divorce is not just a problem in the United States. Countries around the world, both rich and poor, have substantial divorce rates, although in some places the rate is declining (see Figure 14-6).

Figure 14-6 Divorce around the World

Countries around the world have substantial divorce rates, although in some places the rate is declining.

(**Source:** Adapted from Population Council Report, 2009.)



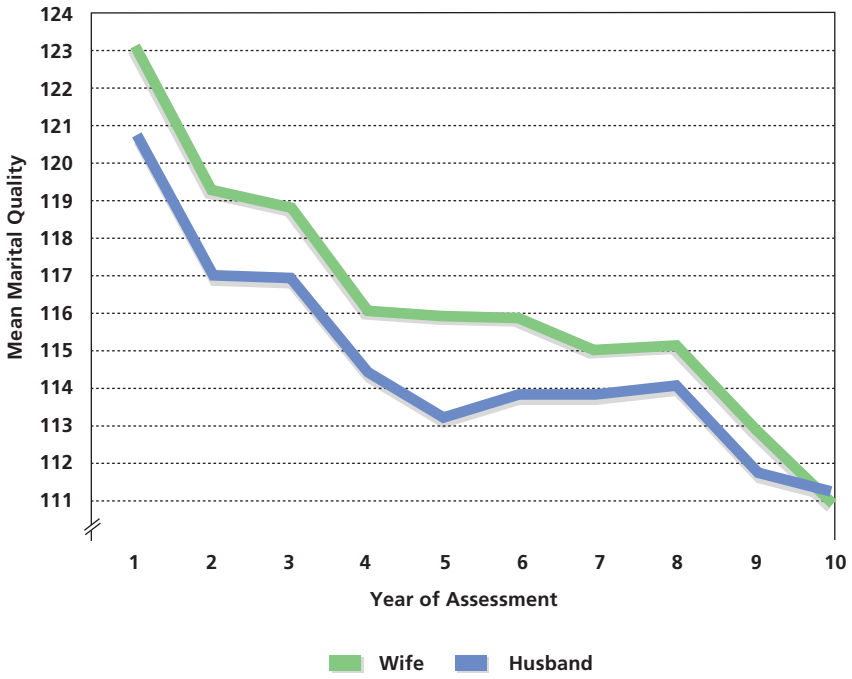
Although we discuss the consequences of divorce in greater detail in Chapter 16 when we consider middle age, divorce is a problem that has its roots in early adulthood and the early years of marriage. In fact, most divorces occur during the first 10 years of marriage.

EARLY MARITAL CONFLICT. Conflict in marriage is not unusual. According to some statistics, nearly half of newly married couples experience a significant degree of conflict. One of the major reasons is that partners may initially idealize one another, perceiving each other

Figure 14-7 Perceptions of Marital Quality

At the beginning of marriage, partners see each other in a more idealized manner. But as time passes, the perception of the quality of the marriage declines.

(**Source:** Kurdek, 1999.)



through the proverbial "starry eyes." However, as the realities of day-to-day living together and interacting begin to sink in, they become more aware of flaws, like the wife whose quotation began this section of the chapter. Perceptions of marital quality over the first 10 years of marriage on the part of both wives and husbands show a decline in the early years, followed by a period of stabilization, and then additional decline (see Figure 14-7; Kurdek, 2008; Huston et al., 2001; Karney & Bradbury, 2005).

There are many sources of marital conflict. Husbands and wives may have difficulty making the transition from being children of their parents to being autonomous adults. Others have difficulty developing an identity apart from their spouses, while some struggle to find a satisfactory allocation of time to share with the spouse, compared with time spent with friends and other family members (Caughlin, 2002; Crawford, Houts, & Huston, 2002; Murray, Bellavia, & Rose, 2003).

Successful marriage involves companionship and mutual enjoyment of various activities.

Most married couples, however, view the early years of marriage as deeply satisfying. For them, marriage can be a kind of extension of courtship. As they negotiate changes in their relationship and learn more about each other, many couples find themselves more deeply in love than before marriage. For many couples, the newlywed period is one of the happiest of their entire married lives (Bird & Melville, 1994; Orbuch et al., 1996; McNulty & Karney, 2004).

Parenthood: Choosing to Have Children

LO 14.7 Describe how the arrival of children affects a relationship in early adulthood.

Deciding whether to have children is one of the most important decisions couples make. What makes a couple decide to have children? Childrearing decidedly isn't economically advantageous: According to the U.S. government, a middle-class family with two children spends around $235,000 for each child by the time the child reaches the age of 18. Add in the costs of college and the figure comes to over $300,000 per child. And if you take into account the cost of care provided by

families for their children, the total costs of caring for children are at least twice as high as the government estimates (Lino & Carlson, 2009; Folbre, 2012).

Instead, young adults typically cite psychological reasons for having children. They expect to derive pleasure from watching their children grow, fulfillment from their children's accomplishments, satisfaction from seeing them become successful, and enjoyment from forging a close bond with their children. But there also may be a self-serving element in the decision to have children. For example, parents-to-be may hope that their children will provide for them in their old age, maintain a family business or farm, or simply offer companionship. Others have children because to do so is such a strong societal norm: More than 90 percent of all married couples have at least one child, although most Americans prefer smaller families over larger ones (Saad, 2011).

For some couples, there is no decision to have children. Some children are unplanned, the result of the failure or absence of birth control methods. In some cases, the couple may have planned to have children at some point in the future, and so the pregnancy is not regarded as particularly undesirable and may even be welcomed. But in families that had actively not wanted to have children or already had what they considered "enough" children, the pregnancy can be viewed as problematic (Leathers & Kelley, 2000; Pajulo, Helenius, & MaYes, 2006).

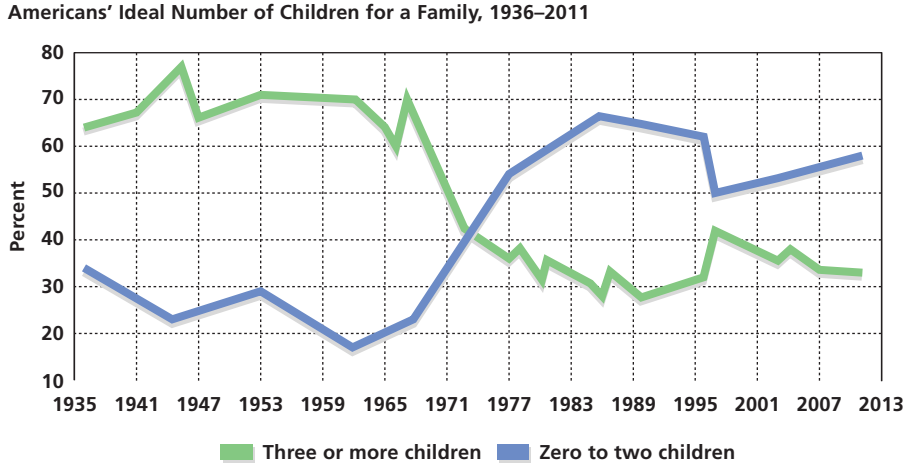
The couples who are most likely to have unwanted pregnancies are often the most vulnerable in society. Unplanned pregnancies occur most frequently in younger, poorer, and less-educated couples. Happily, there has been a dramatic rise in the use and effectiveness of contraceptives, and the incidence of undesired pregnancies has declined in the last several decades (Centers for Disease Control, 2003; Villarosa, 2003).

For many young adults, the decision to have children is independent of marriage. Although overall most women (59 percent) are married when they have children, more than half of births to women in the United States under the age of 30 now occur outside of marriage. The only demographic group for which this is not true is young adult women with a college education; they overwhelmingly still choose to be married before having children (DeParle & Tavernise, 2012).

FAMILY SIZE. The availability and use of effective contraceptives has dramatically decreased the number of children in the average American family. Almost 70 percent of Americans polled in the 1930s agreed that the ideal number of children was three or more, but by the 1990s the percentage had shrunk to less than 40 percent. Today, most families seek to have no more than two children—although most say that three or more is ideal if money is no object (see Figure 14-8; Gallup Poll, 2004; Saad, 2011).

Figure 14-8 Smaller Is Better

Continuing trends over the last 75 years, U.S. parents continue to prefer families with fewer children. What do you think is the ideal number of children for a family to have?
(**Source:** Saad, 2011.)



These preferences have been translated into changes in the actual birth rate. In 1957, the *fertility rate* reached a post–World War II peak in the United States of 3.7 children per woman and then began to decline. Today, the rate is at 2.1 children per woman, which is less than the *replacement level*, the number of children that one generation must produce to be able to replenish its numbers. In contrast, in some underdeveloped countries, the fertility rate is as high as 6.3 (in Afghanistan and Zambia; World Bank, 2012).

What has produced this decline in the fertility rate? In addition to the availability of more reliable birth control methods, one reason is that increasing numbers of women have joined the workforce. The pressures of simultaneously holding a job and raising a child have convinced many women to have fewer children.

Furthermore, many women who work outside the home are choosing to have children later in their childbearing years in order to develop their careers. Women between the ages of 30 and 34 are the only ones whose rate of births has actually increased over earlier decades. Still, because women who have their first children in their 30s have fewer years in which to have children, they ultimately cannot have as many children as women who begin childbearing in their 20s. Research suggesting that there are health benefits for mothers in terms of spacing children further apart may lead families to ultimately have fewer children (Marcus, 2004).

Some of the traditional incentives for having children—such as their potential for providing economic support in old age—may also no longer be as attractive. Potential parents may view Social Security and other pensions as a more predictable means of support when they are elderly than relying on their children. There is also, as mentioned earlier, the sheer cost of raising a child, particularly the well-publicized increase in the cost of college. This enormous cost, too, may act as a disincentive for bearing larger numbers of children.

Finally, some couples avoid having children because they fear they will not be good parents or simply because they don't want the work and responsibility involved in childrearing. Women may also fear that they will share a disproportionate amount of the effort involved in childrearing—a perception that may be an accurate reading of reality, as we consider next.

DUAL-EARNER COUPLES. One of the major historical shifts affecting young adults that began in the last half of the twentieth century is the increase in the number of families in which both parents work. Close to three-quarters of married women with school-aged children are employed outside the home, and more than half of mothers with children under the age of six are working. In the mid-1960s, only 17 percent of mothers of one-year-olds worked full time; now, more than 50 percent do. In the majority of families, both husband and wife work (Darnton, 1990; Carnegie Task Force, 1994; Barnett & Hyde, 2001).

For married couples who both work and have no children, the combined total of paid (in the office) and unpaid work (the chores at home) is nearly identical, at 8 hours 11 minutes for men, and 8 hours 3 minutes for women. And even for those families who have children under the age of 18, women who are employed full time do only 20 minutes more of combined paid and unpaid work (Konigsberg, 2010).

As increasing numbers of women have joined the workforce, more are choosing to have fewer children and have them later.

On the other hand, the nature of husbands' contributions to the household often differs from that of wives. For instance, husbands tend to carry out chores such as mowing the lawn or house repairs that are more easily scheduled in advance (or sometimes postponed), while women's household chores tend to be devoted to things that need immediate attention, such as child care and meal preparation. As a result, wives experience greater levels of anxiety and stress (Lee, Vernon-Feagans, & Vazquez, 2003; Bureau of Labor Statistics, 2012; Ogolsky, Dennison, & Monk, 2014; see Figure 14-9).

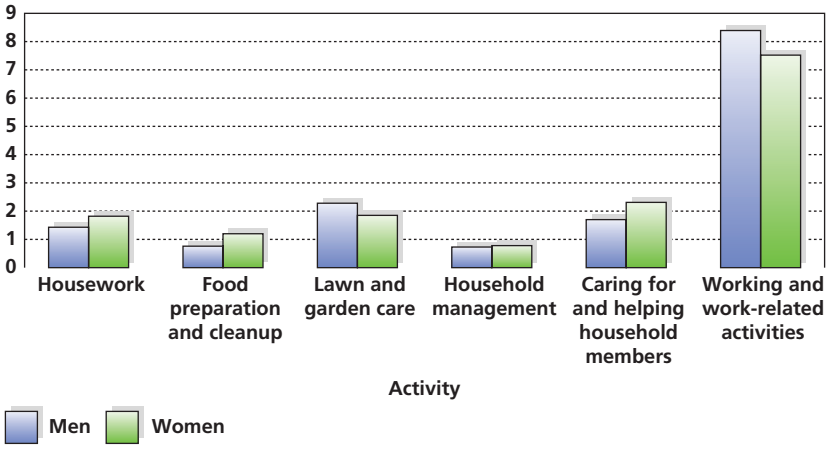
THE TRANSITION TO PARENTHOOD: TWO'S A COUPLE, THREE'S A CROWD?

We had no idea what we were getting into when our first child was born. We certainly prepared for the event, reading magazine articles and books and even attending a class on child care. But when Sheanna was actually born, the sheer enormity of the task of taking care of her, her presence at every moment of the day, and the awesome responsibility of raising another human being weighed on us like nothing else we'd ever faced. Not that it was a burden. But it did make us look at the world with an entirely different perspective.

Figure 14-9 Division of Labor

Although husbands and wives generally work at their paying jobs a similar number of hours each week, wives are apt to spend more time than their husbands doing home chores and in child-care activities. Why do you think this pattern exists?

(**Source:** Bureau of Labor Statistics, 2012.)



Note: Figures refer to average hours per day for persons who engaged in the activity.

The arrival of a child alters virtually every aspect of family life, in positive and, sometimes, negative ways. The addition of a child to a household brings about a dramatic shift in the roles spouses must play. They are suddenly placed in new roles—"mother" and "father"—and these new positions may overwhelm their ability to respond in their older, though continuing, roles of "wife" and "husband." In addition, the birth of a child produces significant physical and psychological demands, including near-constant fatigue, new financial responsibilities, and an increase in household chores (Meijer & van den Wittenboer, 2007).

Furthermore, in contrast to many non-Western cultures, in which childrearing is seen as a task that involves the entire community, Western culture's emphasis on individualism views childrearing as a primarily private enterprise. Thus, mothers and fathers in Western society are largely left to forge their own paths after the birth of a child, often without significant community support (Rubin & Chung, 2006; Lamm & Keller, 2007).

Consequently, for many couples, the strains accompanying the birth of a child produce the lowest level of marital satisfaction of any point in their marriage. This is particularly true for women, who tend to be more dissatisfied than men with their marriages after the arrival of children. The most likely reason for this gender difference is that wives often experience a greater increase in their responsibilities than husbands do, even in families in which parents seek to share childrearing chores (Laflamme, Pomerleau, & Malcuit, 2002; Lu, 2006).

This is not to say that all couples experience a decrease in marital satisfaction upon the birth of a child. According to work by John Gottman and colleagues (Shapiro, Gottman, & Carrère, 2000), marital satisfaction can remain steady, and actually rise, with the birth of a child. They identified three factors that permitted couples to successfully weather the increased stress that follows the birth of a child:

- Working to build fondness and affection toward one's partner
- Remaining aware of events in one's spouse's life and responding to those events
- Considering problems as controllable and solvable

In particular, those couples who were well satisfied with their marriages as newlyweds were more likely to continue to be satisfied as they raised their children. Couples who harbor realistic expectations regarding the extent of childrearing effort and other household responsibilities they face when children are born also tend to be more satisfied after they become parents. Furthermore, parents who work together as a *coparenting team*, in which

Parenthood expands the roles of both husbands and wives into that of fathers and mothers, a process that can have profound effects on couples' relationships.

they thoughtfully adopt common childrearing goals and strategies, are more apt to be satisfied with their parenting roles (Schoppe-Sullivan et al., 2006; McHale & Rotman, 2007).

In short, having children can well lead to greater marital satisfaction—at least for couples who are already satisfied with their marriage. For marriages in which satisfaction is low, having children may make a bad situation worse (Shapiro et al., 2000; Driver, Tabares, & Shapiro, 2003; Lawrence et al., 2008).

Gay and Lesbian Parents

LO 14.8 Compare gay and lesbian parents to heterosexual parents.

In increasing numbers, children are being raised in families in which there are two moms or two dads. Rough estimates suggest that around 16 to 20 percent of same-sex couples are parents (Gates, 2012).

How do lesbian and gay households compare to heterosexual households? To answer the question, we first need to consider some characteristics of gay and lesbian couples without children. According to studies comparing gay, lesbian, and heterosexual couples, labor tends to be divided more evenly in homosexual households than in heterosexual households. Each partner in a homosexual relationship is more likely to carry out approximately the same number of different chores, compared with heterosexual partners. Furthermore, gay and lesbian couples cling more strongly to the ideal of an egalitarian allocation of household work than heterosexual couples do (Kurdek, 2003b, 2007).

As with heterosexual couples, however, the arrival of a child (usually through adoption or artificial insemination) changes the dynamics of household life considerably in homosexual couples. As in heterosexual unions, a specialization of roles develops. According to recent research on lesbian mothers, for instance, childrearing tends to fall more to one member of the couple, while the other spends more time in paid employment. Although both partners usually say they share household tasks and decision making equally, biological mothers are more involved in child care. Conversely, the nonbiological mother in the couple is more likely to report spending greater time in paid employment (Patterson, 2013).

WATCH THIS VIDEO ON MYPSYCHLAB

A FAMILY WITH TWO FATHERS

The evolution of the relationship between homosexual couples when children arrive appears to be more similar to that of heterosexual couples than dissimilar, particularly in the increased role specialization occasioned by the requirements of child care. The experience for children of being in a household with two parents of the same sex is also similar. Most research suggests that children raised in households in which the parents are homosexual show no differences in terms of eventual adjustment from those raised in heterosexual households. Although they may face greater challenges from a society in which the roots of prejudice against homosexuality are deep, children who have two moms or two dads ultimately seem to fare well (Crowl, Ahn, & Baker, 2008; Patterson, 2009; Weiner & Zinner, 2015).

Staying Single: I Want to Be Alone

LO 14.9 Explain why some people choose to remain single in early adulthood.

For some people, neither marriage nor cohabitation is the preferred option. To them, living alone represents a good path, consciously chosen, through life. *Singlehood*, living alone without an intimate partner, has increased significantly in the last several decades, encompassing around 20 percent of women and 30 percent of men. Almost 20 percent will probably spend their entire lives in singlehood (U.S. Bureau of the Census, 2012).

People who choose not to marry or live with a partner give several reasons for their decision. One is that they view marriage negatively. Rather than seeing marriage in the idealized terms presented in the media of the 1950s, they focus more on high divorce rates and marital strife. Ultimately, they conclude that the risks of forming a lifetime union may be too high.

Others view marriage as too restrictive. These individuals place great value on personal change and growth, which would be impeded by the stable, long-term commitment implied by marriage. Finally, some people simply do not encounter anyone with whom they wish to spend the remainder of their lives. Instead, they value their independence, autonomy, and freedom (DePaulo, 2004, 2006).

Despite the advantages of singlehood, there are also drawbacks. Society often stigmatizes single individuals, particularly women, holding up marriage as the idealized norm. Furthermore, there can be a lack of companionship and sexual outlets, and singles may feel that their futures are less secure financially (Byrne, 2000; Schachner, Shaver, & Gillath, 2008).

Module 14.2 Review

- Cohabitation is an increasingly popular option for young adults, but most still choose to marry. Divorce is prevalent in the United States, particularly within the first 10 years of marriage. Partners in successful relationships share interests, affection, communication, and household responsibilities.
- Couples overwhelmingly desire to produce children, although the availability of contraception and changes in women's roles in the workplace have combined to decrease average family size.
- Children bring pressures to both heterosexual and homosexual relationships, causing changes in focus, roles, and responsibilities.
- An increasing number of people in recent decades have chosen singlehood. Reasons include a negative view of marriage and a preference for independence. Single people often face societal suspicion and may experience a lack of companionship and financial insecurity.

Journal Writing Prompt

Applying Lifespan Development: In what ways do you think cognitive changes in early adulthood (e.g., the emergence of postformal thought and practical intelligence) affect how young adults deal with questions of marriage, divorce, and childrearing?

Work: Choosing and Embarking on a Career

Why did I decide that I wanted to be a lawyer? The answer is a bit embarrassing. When I got to my senior year of college, I began to worry about what I was going to do when I graduated. My parents were asking, with increasing frequency, what kind of work I was thinking about, and I felt the pressure rising with each phone call from home. So I began to think seriously about the problem. At the time, there was some big trial in the news all the time, and it got me to thinking about what it might be like to be an attorney. And I had always been fascinated by Law and Order when it had been on television. For these reasons, and just about none other, I decided to take the law boards and apply to law school.

For almost all of us, early adulthood is a period of decisions with lifelong implications. One of the most critical is choosing a career path. The choice we make goes well beyond determining how much money we will earn; it also relates to our status, our sense of self-worth, and the contribution that we will make in life. In sum, decisions about work go to the very core of a young adult's identity.

Identity during Young Adulthood: The Role of Work

LO 14.10 Explain the role of careers in the lives of young adults.

According to psychiatrist George Vaillant, young adulthood is marked by a stage of development called career consolidation. During **career consolidation**, a stage that begins between the ages of 20 and 40, young adults become centered on their careers. Based on a comprehensive longitudinal study of a large group of male graduates of Harvard, begun

career consolidation
a stage that is entered between the ages of 20 and 40, when young adults become centered on their careers

WATCH THIS VIDEO ON MYPSYCHLAB YOUNG ADULTHOOD: WORK, JESSICA

when they were freshmen in the 1930s, Vaillant found a general pattern of psychological development (Vaillant, 1977; Vaillant & Vaillant, 1990).

In their early 20s, the men tended to be influenced by their parents' authority. But in their late 20s and early 30s, they started to act with greater autonomy. They married and began to have and raise children. At the same time, they began to focus on their careers—the period of career consolidation.

Based on his data, Vaillant drew a relatively uninspiring portrait of people in the career consolidation stage. The participants in his study worked very hard because they were working their way up the corporate ladder. They tended to be rule-followers who sought to conform to the norms of their professions. Rather than showing the independence and questioning that they had displayed earlier, while still in college, they threw themselves unquestioningly into their work.

Vaillant argues that work played such an important role in the lives of the men he studied that the career consolidation stage should be seen as an addition to Erikson's intimacy-versus-isolation stage of psychosocial identity. In Vaillant's view, career concerns come to supplant the focus on intimacy, and the career consolidation stage marks a bridge between Erikson's intimacy-versus-isolation stage and Erikson's next period, that of generativity-versus-stagnation stage. (*Generativity* refers to an individual's contribution to society.)

However, the reaction to Vaillant's viewpoint has been mixed. Critics point out, for instance, that Vaillant's sample, though relatively large, comprised a highly restricted, unusually bright group of people, all of them men. It is hard to know how generalizable the results are. Furthermore, societal norms have changed considerably since the time the study was begun in the late 1930s, and people's views of the importance of work may have shifted. Finally, the lack of women in the sample and the fact that there have been major changes in the role of work in *women's* lives make Vaillant's conclusions even less generalizable.

Still, it is hard to argue about the importance of work in most people's lives, and current research suggests that it makes up a significant part of both men's and women's identity—if for no other reason than that many people spend more time working than they do on any other activity (Deaux et al., 1995). We turn now to how people decide what careers to follow—and the implications of that decision.

Picking an Occupation: Choosing Life's Work

LO 14.11 List factors that influence the choice of a career in early adulthood.

Some people know from childhood that they want to be physicians or firefighters or to go into business, and they follow invariant paths toward their goals. For others, the choice of a career is very much a matter of chance, of turning to the want ads and seeing what's available. Many of us fall somewhere between these two extremes.

fantasy period
according to Ginzberg, the period, lasting until about age 11, when career choices are made, and discarded, without regard to skills, abilities, or available job opportunities

tentative period
the second stage of Ginzberg's theory, which spans adolescence, when people begin to think in pragmatic terms about the requirements of various jobs and how their own abilities might fit with them

GINZBERG'S CAREER CHOICE THEORY. According to Eli Ginzberg (1972), people typically move through a series of stages in choosing a career. The first stage is the **fantasy period**, which lasts until a person is around 11. During the fantasy period, career choices are made, and discarded, without regard to skills, abilities, or available job opportunities. Instead, choices are made solely on the basis of what sounds appealing. Thus, a child may decide he wants to be a rock star—despite the fact that he cannot carry a tune.

People begin to take practical considerations into account during the **tentative period**, which spans adolescence. They begin to think more practically about the requirements of various jobs and how their own abilities and interests might fit with them. They also consider

their personal values and goals, exploring how well a particular occupation might satisfy them.

Finally, in early adulthood, people enter the realistic period. In the **realistic period**, young adults explore specific career options either through actual experience on the job or through training for a profession. After initially exploring what they might do, people begin to narrow their choices to a few alternative careers and eventually make a commitment to a particular one.

Although Ginzberg's theory makes sense, critics have charged that it oversimplifies the process of choosing a career. Because Ginzberg's research was based on subjects from middle socioeconomic levels, it may overstate the choices and options available to people in lower socioeconomic levels. Furthermore, the ages associated with the various stages may be too rigid. For instance, a person who does not attend college but begins to work immediately after high-school graduation is likely to be making serious career decisions at a much earlier point than a person who attends college. In addition, economic shifts have caused many people to change careers at different points in their adult lives.

According to one theory, people move through a series of life stages in choosing a career. The first stage is the fantasy period, which lasts until a person is around 11 years old.

realistic period
the third stage of Ginzberg's theory, which occurs in early adulthood, when people begin to explore specific career options, either through actual experience on the job or through training for a profession, and then narrow their choices and make a commitment

HOLLAND'S PERSONALITY TYPE THEORY. Other theories of career choice emphasize how an individual's personality affects decisions about a career. According to John Holland, for instance, certain personality types match particularly well with certain careers. If the correspondence between personality and career is good, people will enjoy their careers more and be more likely to stay in them; but if the match is poor, they will be unhappy and more likely to shift into other careers (Holland, 1997).

According to Holland, six personality types are important in career choice:

- ***Realistic.*** Realistic people are down-to-earth, practical problem-solvers, and physically strong, but their social skills are mediocre. They make good farmers, laborers, and truck drivers.
- ***Intellectual.*** Intellectual types are oriented toward the theoretical and abstract. Although not particularly good with people, they are well suited to careers in math and science.
- ***Social.*** The traits associated with the social personality type are related to verbal skills and interpersonal relations. Social types are good at working with people, and consequently make good salespersons, teachers, and counselors.
- ***Conventional.*** Conventional individuals prefer highly structured tasks. They make good clerks, secretaries, and bank tellers.
- ***Enterprising.*** These individuals are risk-takers and take-charge types. They are good leaders and may be particularly effective as managers or politicians.
- ***Artistic.*** Artistic types use art to express themselves, and they often prefer the world of art to interactions with people. They are best suited to occupations involving art.

Holland's personality categories form the basis of a number of measures often used in college career centers to help students identify appropriate careers. Rather than providing a single personality type, most measures based on Holland's categories provide a score for each of the categories, assuming that individuals vary in the degree to which a particular type applies.

Are You an Informed Consumer of Development?

Choosing a Career

One of the greatest challenges people face in early adulthood is making a decision that will have lifelong implications: the choice of a career. Although there is no single correct choice—most people can be happy in any of several different jobs—the options can be daunting. Following are some guidelines for at least starting to come to grips with the question of what occupational path to follow:

- Systematically evaluate a variety of choices. Libraries contain a wealth of information about potential career paths, and most colleges and universities have career centers that can provide occupational data and guidance.
- Know yourself. Evaluate your strengths and weaknesses, perhaps by completing a questionnaire at a college career center that can provide insight into your interests, skills, and values.
- Create a "balance sheet" listing the potential gains and losses that you will incur from a particular profession. First list the gains and losses that you will experience directly, and then list gains and losses for others, such as family members. Next, write down your projected self-approval or self-disapproval from the potential career. Finally, write down the projected social approval or disapproval you are likely to receive from others. By systematically evaluating a set of potential careers according to each of these criteria, you will be in a better position to compare different possibilities.
- "Try out" different careers through paid or unpaid internships. By seeing a job first-hand, interns are able to get a better sense of what an occupation is truly like.
- Remember that if you make a mistake, you can change careers. People today increasingly change careers in early adulthood and even beyond. No one should feel locked into a decision made earlier in life. As we have seen throughout this book, people develop substantially over the course of their lives.
- It is reasonable to expect that shifting values, interests, abilities, and life circumstances might make a different career more appropriate later in life than the one chosen during early adulthood.

Although Holland's enumeration of personality types is sensible, it suffers from a central flaw: Not everyone fits neatly into particular personality types. Furthermore, there are certainly exceptions to the typology, with jobs being held by people who don't have the particular personality that Holland would predict. Still, the basic notions of the theory have been validated, and they form the foundation of several of the "job quizzes" that people can take to see what occupations they might especially enjoy (Armstrong, Rounds, & Hubert, 2008; Martincin & Stead, 2015). (Also see the *Are You an Informed Consumer of Development?* box.)

Gender and Career Choices: Women's Work

LO 14.12 Describe how gender affects work choices and the work environment.

> *WANTED: Full-time employee for small family firm. DUTIES: Including but not limited to general cleaning, cooking, gardening, laundry, ironing and mending, purchasing, bookkeeping and money management. Child care may also be required. HOURS: Avg. 55/wk but standby duty required 24 hours/day, 7 days/wk. Extra workload on holidays. SALARY AND BENEFITS: No salary, but food, clothing, and shelter provided at employer's discretion; job security and benefits depend on continued goodwill of employer. No vacation. No retirement plan. No opportunities for advancement. REQUIREMENTS: No previous experience necessary, can learn on the job. Only women need apply. (Unger & Crawford, 1992, p. 446)*

A generation ago, many women entering early adulthood assumed that this admittedly exaggerated job description matched the work for which they were best suited and to which they aspired: housewife. Even those women who sought work outside the home were relegated to certain professions. For instance, until the 1960s, employment ads in newspapers throughout the United States were almost always divided into two sections: "Help Wanted: Male" and "Help Wanted: Female." The men's job listings encompassed such professions as police officer, construction worker, and legal counsel; the women's listings were for secretaries, teachers, cashiers, and librarians.

The breakdown of jobs deemed appropriate for men and women reflected society's traditional view of what the two genders were best suited for. Traditionally, women were considered most appropriate for **communal professions**, occupations associated with relationships, such as nursing. In contrast, men were perceived as best suited for agentic professions. **Agentic professions** are associated with getting things accomplished, such as carpentry. It is probably no coincidence that communal professions typically have lower status and pay than agentic professions (Eagly & Steffen, 1986; Hattery, 2000; Trapnell & Paulhus, 2012).

communal professions
occupations that are associated with relationships

agentic professions
occupations that are associated with getting things accomplished

From *a social worker's* perspective

How does the division of work into communal jobs (associated with relationships) and agentic jobs (associated with getting things done) relate to traditional views of male–female differences?

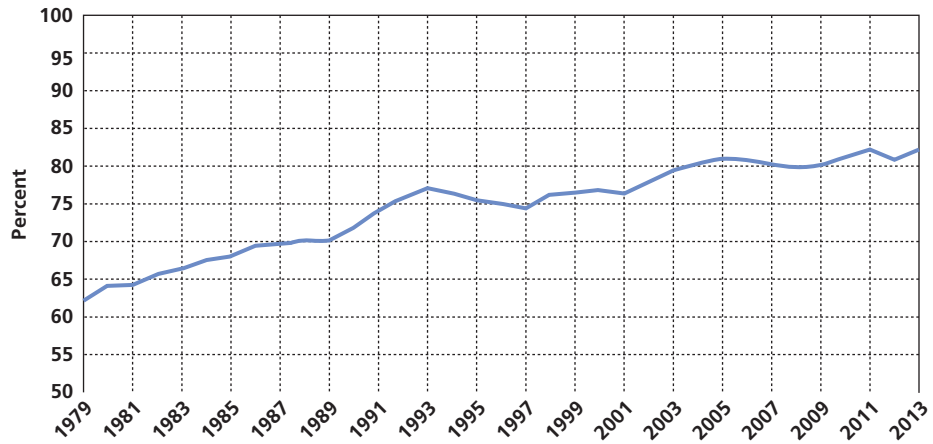
Although discrimination based on gender is far less blatant today than it was several decades ago—it is now illegal, for instance, to advertise a position specifically for a man or a woman—remnants of traditional gender-role prejudice persist. As we discussed in Chapter 13, women are less likely to be found in traditionally male-dominated professions such as engineering and computer programming. As shown in Figure 14-10, although significant progress in closing the gender wage gap was made in the last 40 years, women's weekly earnings still lag behind those of men. Women in many professions earn significantly less than men in identical jobs (Frome et al., 2006; U.S. Bureau of Labor Statistics, 2014).

More women are working outside the home than ever before, despite status and pay that are often lower than men's. Between 1950 and 2010, the percentage of the female population (aged 16 and over) in the U.S. labor force increased from 35 percent to close to 60 percent, and women today make up around 47 percent of the labor force. Almost all women expect to earn a living, and almost all do at some point in their lives. Furthermore, in 24 percent of U.S. households, women earn more than their husbands (U.S. Bureau of Labor Statistics, 2010, 2013).

Opportunities for women are considerably greater than they were in earlier years. Women are more likely to be physicians, lawyers, insurance agents, and bus drivers than they were in the past. However, as noted earlier, within specific job categories, there are still notable gender differences. For example, female bus drivers are more apt to have part-time school bus routes, whereas men hold better-paying full-time routes in cities. Similarly, female pharmacists are more likely to work in hospitals, whereas men work in higher-paying jobs in retail stores (Unger & Crawford, 2003).

Figure 14-10 The Gender Wage Gap

Women's weekly earnings as a percentage of men's have increased since 1979 but are still only a bit more than 79 percent and have remained steady over the past three years.
(**Source:** U.S. Bureau Labor Statistics, 2014.)



In the same way, women (and minorities, too) in high-status, visible professional roles may hit what has come to be called the *glass ceiling*. The glass ceiling is an invisible barrier within an organization that, because of discrimination, prevents individuals from being promoted beyond a certain level. It operates subtly, and often the people responsible for keeping the glass ceiling in place are unaware of how their actions perpetuate discrimination against women and minorities (Goodman, Fields, & Blum, 2003; Stockdale & Crosby, 2004; Dobele, Rundle-Thiele, & Kopanidis, 2014).

Why Do People Work? More Than Earning a Living

LO 14.13 Explain why people work and what elements of a job bring satisfaction.

This may seem an easy question to answer: People work to earn a living. Yet the reality is different; young adults express many reasons for seeking a job.

extrinsic motivation
motivation that drives people to obtain tangible rewards, such as money and prestige

intrinsic motivation
motivation that causes people to work for their own enjoyment, not just for the rewards work may bring

INTRINSIC AND EXTRINSIC MOTIVATION. Certainly, people work in order to obtain various concrete rewards, or out of extrinsic motivation. **Extrinsic motivation** drives people to obtain tangible rewards, such as money and prestige (D'Lima, Winsler, & Kitsantas, 2014).

People also work for their own enjoyment, for personal rewards, not just for the financial rewards a job may bring. This is known as **intrinsic motivation**. People in many Western societies tend to subscribe to the Puritan work ethic, the notion that work is important in and of itself. According to this view, working is a meaningful act that brings psychological and (at least in the traditional view) even spiritual well-being and satisfaction.

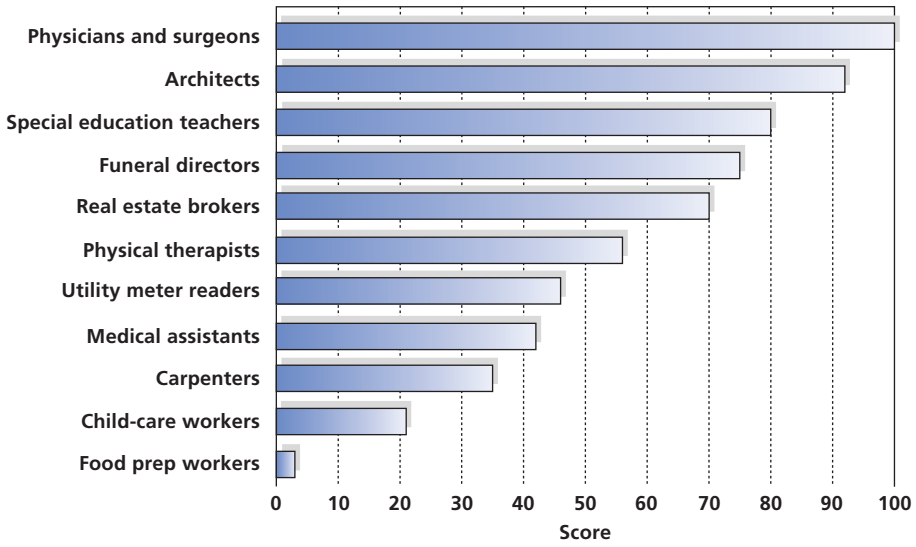
Work also brings a sense of personal identity. Consider, for instance, what people say about themselves when they first meet someone. After mentioning their names and where they live, they very typically tell what they do for a living. What people do is a large part of who they are.

Work also may be a central element in people's social lives. Because so much time is spent in work settings, work can be a source of young adults' friends and social activities. Social relationships forged at work may spill over into other parts of people's lives. In addition, there are often social obligations—dinner with the boss, or the annual seasonal party in December—that are related to work.

status
the evaluation by society of the role a person plays

Finally, the kind of work that people do is a factor in determining status. **Status** is the evaluation by society of the role a person plays. Various jobs are associated with a certain status, as indicated in Figure 14-11. For instance, physicians and lawyers are near the top of the status hierarchy, while counter attendants and dishwashers fall to the bottom.

Figure 14-11 Status Hierarchy of Various Professions
(**Source:** Based on Nam & Boyd, 2004.)



SATISFACTION ON THE JOB. The status associated with particular jobs affects people's satisfaction with their work. As might be expected, the higher the status of the job, the more satisfied people tend to be. Furthermore, the status of the job of the major wage-earner can affect the status of the other members of the family (Green, 1995; Schieman, McBrier, & van Gundy, 2003).

Of course, status isn't everything: Worker satisfaction depends on a number of factors, not the least of which is the nature of the job itself. For example, some people who work at computers are monitored on a minute-by-minute basis; supervisors can consistently see how many keystrokes they are entering. In some firms in which workers use the phone for sales or to take customer orders, conversations are monitored by supervisors. Workers' web use and e-mail are also monitored or restricted by a large number of employers. Not surprisingly, such forms of job stress produce worker dissatisfaction (MacDonald, 2003).

Job satisfaction is higher when workers have input into the nature of their jobs and feel their ideas and opinions are valued. They also prefer jobs that offer variety, requiring many different types of skills, over those that require only a few. Finally, the more influence employees have over others, either directly as supervisors or more informally, the greater their job satisfaction (Peterson & Wilson, 2004; Thompson & Prottas, 2006; Carton & Aiello, 2009).

Module 14.3 Review

- Choosing a career is an important step in early adulthood, so important that George Vaillant considers career consolidation a developmental stage on a par with Erikson's intimacy-versus-isolation stage.
- According to Eli Ginzberg, people pass through three stages in considering careers: the fantasy period, the tentative period, and the realistic period. Other theories of career choice, such as John Holland's, attempt to match personality types to suitable careers.
- Gender stereotypes are changing, but women still experience subtle prejudice in career choices, roles, and wages.
- People work because of both extrinsic and intrinsic motivation factors.

Journal Writing Prompt

Applying Lifespan Development: If Vaillant's study were performed today on women, in what ways do you think the results would be similar to or different from those of the original study?

Epilogue

Our examination of early adulthood revealed a period less dramatic than others in terms of evident growth, but no less important or less characterized by change and development. We witnessed individuals at the peak of health and the height of their intellectual powers entering a period of their lives in which true independence is the challenge and the goal.

In this chapter, we looked at some of the most significant issues of early adulthood: forming relationships, falling in love and potentially getting married, and finding a career. We explored the factors that lead to loving relationships, the considerations that affect the choice of whether and whom to marry, and the characteristics of good—and not so good—marriages. We also discussed factors that people consider in choosing careers and the features of careers that make them satisfying.

Before we move on to middle adulthood in the next chapter, recall the prologue that began this chapter, about Grace Kennedy, the musician/composer who lives, loves, and works in Brooklyn. In light of your knowledge of relationships and careers in early adulthood, answer the following questions.

1. How would you describe Grace's social clock? Though unconventional, why might she perceive her social clock as being "right on time"?
2. Do you feel Grace's life exemplifies "emerging adulthood"? Why or why not?
3. Consider Grace's life in terms of Erikson's intimacy-versus-isolation stage. Do you see Grace as being capable of intimacy? Explain your thinking.
4. Grace works at a food co-op while she pursues her passion for playing and composing music. Do you see this as an actual career choice? Do you think it is part of a trend among young adults?

Looking Back

LO 14.1 Summarize what makes young adults happy and what is meant by the social clock.

For young adults, happiness is related to psychological factors, such as independence, competence, self-esteem, and relationships with others.

LO 14.2 Explain how young adults respond to the need for intimacy and friendship and how liking turns to loving.

Young adults face Erikson's intimacy-versus-isolation stage, with those who resolve this conflict being able to develop intimate relationships with others.

LO 14.3 Differentiate the different kinds of love.

Passionate love is characterized by intense physiological arousal, intimacy, and caring, while companionate love is characterized by respect, admiration, and affection. Psychologist Robert Sternberg suggests that three components of love (intimacy, passion, and decision/commitment) combine to form eight types of love through which a relationship can dynamically evolve.

LO 14.4 Describe how young adults choose spouses.

Although in Western cultures love tends to be the most important factor in selecting a partner, other cultures emphasize other factors. According to filtering models, people filter potential partners initially for attractiveness and then for compatibility, generally conforming to the principle of homogamy and the marriage gradient. Gays and lesbians generally seek the same qualities in relationships as heterosexual men and women: attachment, caring, intimacy, affection, and respect.

LO 14.5 Explain how infant attachment styles are related to romantic relationships as adults.

Evidence suggests that people's attachment styles in infancy can affect the nature of their future romantic relationships as adults.

LO 14.6 Describe the sorts of relationships people enter into in early adulthood and what makes these relationships work or cease to work.

In young adulthood, while cohabitation is popular, marriage remains the most attractive option. The median age of first marriage is rising for both men and women. Partners in successful marriages visibly show affection to one another, communicate relatively little negativity, and see themselves as part of an interdependent couple rather than as one of two independent individuals. Divorce is prevalent in the United States, affecting nearly half of all marriages.

LO 14.7 Describe how the arrival of children affects a relationship in early adulthood.

More than 90 percent of married couples have at least one child, but the size of the average family has decreased, due partly to birth control and partly to the changing roles of women in the workforce. Children bring pressures to any marriage, shifting the focus of the marriage partners, changing their roles, and increasing their responsibilities.

LO 14.8 Compare gay and lesbian parents to heterosexual parents.

Gay and lesbian parents have more similarities with heterosexual parents than differences. When gay and lesbian parents have children, they experience changes in their relationships that mirror those in heterosexual couples.

LO 14.9 Explain why some people choose to remain single in early adulthood.

Singlehood is the choice of increasing numbers of people. Those who choose to remain single generally seek independence and wish to avoid the hazards of marriage.

LO 14.10 Explain the role of careers in the lives of young adults.

According to Vaillant, career consolidation is a developmental stage in which young adults are involved in defining their careers and themselves.

LO 14.11 List factors that influence the choice of a career in early adulthood.

A model developed by Ginzberg suggests that people typically move through three stages in choosing a career: the fantasy period of youth, the tentative period of adolescence, and the realistic period of young adulthood. Other approaches, such as that of Holland, attempt to match people's personality types with suitable careers. This sort of research underlies most career-related inventories and measures used in career counseling.

LO 14.12 Describe how gender affects work choices and the work environment.

Gender-role prejudice and stereotyping remain a problem in the workplace and in preparing for and selecting careers. Women tend to be pressured into certain occupations and out of others, and they earn less money for the same work.

LO 14.13 Explain why people work and what elements of a job bring satisfaction.

People are motivated to work by both extrinsic factors, such as the need for money and prestige, and intrinsic factors,

such as the enjoyment of work and its personal importance. Work helps determine a person's identity, social life, and status. Job satisfaction is the result of many factors, including the nature and status of one's job, the amount of input one has into its nature, the variety of one's responsibilities, and the influence one has over others.

Key Terms and Concepts

social clock 475
intimacy-versus-isolation stage 476
emerging adulthood 477
passionate (or romantic) love 479
companionate love 479
labeling theory of passionate love 479
intimacy component 479
passion component 479
decision/commitment component 479
homogamy 482
marriage gradient 483
cohabitation 486
career consolidation 493
fantasy period 494
tentative period 494
realistic period 495
communal professions 497
agentic professions 497
extrinsic motivation 498
intrinsic motivation 498
status 498

SUMMARY

6 Putting It All Together

Early Adulthood

BELLA ARNOFF AND THEODORE CHOI face many developmental issues typical of young adults. They have to consider the questions of health and aging, and the unspoken admission that they do not have all the time in the world. They have to look at their relationship and decide whether to take what society and nearly all their friends consider the next logical step: marriage. They have to face the question of children and career, and the possibility of giving up the luxury of being a two-earner family. They even have to reconsider Theodore's intention to continue his education. Fortunately they have each other to help deal with the stress of this weighty combination of questions and decisions—and a considerable developmental arsenal of useful skills and abilities.

WHAT WOULD YOU DO?

■ If you were a friend of Bella and Theodore, what factors would you advise them to consider as they contemplate moving from cohabitation to marriage? Would your advice be the same if only Bella or Theodore asked you?

What's your response?

WHAT WOULD A HEALTH-CARE PROVIDER DO?

■ Given that Bella and Theodore are young, in good health, and physically fit, what strategies would you advise them to pursue to stay that way?

What's your response?

Physical Development

- Bella and Theodore's bodies and senses are at their peak, with their physical development nearly complete.
- During this period the couple will increasingly need to pay attention to diet and exercise.
- Because they face so many important decisions, Bella and Theodore are prime candidates for stress.

Cognitive Development

- Bella and Theodore are in Schaie's achieving stage, confronting major life issues, including career and marriage.
- They are able to apply postformal thought to the complex issues they face.
- Dealing with major life events, while causing stress, may also foster cognitive growth in both of them.
- Theodore's desire to return to college is not unusual today, when colleges are serving a diversity of students, including many older students.

Social and Personality Development

- Bella and Theodore are at a time when love and friendship relationships are of major importance.
- The couple are likely to be experiencing a combination of intimacy, passion, and decision/commitment.
- Bella and Theodore have been cohabiting and are now exploring marriage as a relationship option.
- Bella and Theodore are not unusual in taking on the decision about marriage and children—decisions with major implications for the relationship.
- The couple must also decide how to handle the shift from two careers to one, at least temporarily—a decision that is far more than financial.

WHAT WOULD A CAREER COUNSELOR DO?

■ Assuming Bella and Theodore decide to have children, what advice would you give them about handling the major expenses they face and the impact of children on their careers? Would you advise one of them to put his or her career on hold and pursue childrearing full-time? If so, how would you counsel them to decide which career should be put on hold?

What's your response?

WHAT WOULD AN EDUCATOR DO?

■ A friend of Theodore's has told him that he would be "fish out of water" if he went back to graduate school a long time after getting his undergraduate degree. Do you agree? Would you advise Theodore to pursue his graduate school studies right away, before he gets too old, or to wait until his life settles down?

What's your response?

Chapter 15

Physical and Cognitive Development in Middle Adulthood

Learning Objectives

LO 15.1 Describe the physical changes that affect people in middle adulthood.

LO 15.2 Explain how the senses change in middle adulthood.

LO 15.3 Explain how reaction time changes during middle adulthood.

LO 15.4 Compare how middle-aged men and middle-aged women experience changes in sexuality.

LO 15.5 Describe changes in health that occur in middle adulthood.

LO 15.6 Describe the risk factors related to coronary heart disease.

LO 15.7 Summarize what causes cancer and what tools are available to diagnose and treat it.

LO 15.8 Describe what happens to a person's intelligence in middle adulthood.

LO 15.9 Explain the role of expertise in middle adulthood.

LO 15.10 Describe how aging affects memory and how memory can be improved.

Chapter Overview

Prologue: Fighting against Time

Kara Miles, 52, takes pride in keeping it all together. "I don't think perfectionist is a dirty word," she says. Kara trained as an architect in college and started her own firm at age 27. She raised two children, mostly on her own after divorcing her alcoholic husband. She still lives in the spacious country house she designed and entertains lavishly many weekends. "No detail too small to heed," is one of her favorite sayings. Another is: "Never grow old."

"Aging is what happens when people get sloppy," she says. "I don't intend to get sloppy." Kara runs five miles each morning, eats a low-calorie, high-calcium breakfast, and takes weekly classes in modern dance, fencing, and Pilates. In the evenings, she reviews the designs for various projects proposed by her staff while listening to conversational Italian CDs. On weekends when she's not hosting a dinner, she goes to the shore with her lover and companion, Stephan. "Just enough sex to keep everything working," she jokes.

Recently, Kara's firm was challenged by a new architect for a major contract. "He was so cocky, this 20-something design boy," she says. "Thought he would blow the 'old dog' out of the water, but I've been in the business 30 years. You can't beat experience." Kara's firm won the contract. "And I'll still be winning them when I'm 70," she says. "Age? I don't believe in it." ■

Looking Ahead

It is during middle adulthood, roughly defined as the period from 40 to 65 years of age, that many people first face visible reminders that time is passing. Their bodies and, to some extent, their cognitive abilities begin to change in unwelcome ways. Many people make adjustments to meet the changing demands of middle age, but others, like Kara, view age as a challenge they can rise to through exercise, diet, and continued professional success. As we look at the physical, cognitive, and social changes of middle adulthood in this chapter and the next, we see that the period brings good news as well as bad. Many individuals are at the height of their capabilities, engaged in the process of shaping their lives as never before.

We begin the chapter by considering physical development. We consider changes in height, weight, and strength, and discuss the subtle declines in various senses. We also look at the role of sexuality in middle adulthood.

For some people, middle adulthood is a period in which unwelcome health problems begin to affect daily life.

We examine both health and illness during middle age and pay particular attention to two of the major health problems of the period, heart disease and cancer.

The second part of the chapter focuses on cognitive development in middle age. We look at the tricky question of whether or what kind of intelligence declines during the period, and we consider the difficulty of answering the question fully. We also look at memory, examining the ways in which memory capabilities change during middle adulthood.

Physical Development

It crept up gradually on Sharon Boker-Tov. Soon after reaching the age of 40, she noticed that it took her a bit longer to bounce back from minor illnesses, such as colds and the flu. Then she became conscious of changes in her eyesight: She needed more light to read fine print, and she had to adjust how far she held newspapers from her face in order to read them easily. Finally, she couldn't help but notice that the strands of gray hair on her head, which had begun to appear gradually in her late 20s, were becoming a virtual forest.

Physical Transitions: The Gradual Change in the Body's Capabilities

LO 15.1 Describe the physical changes that affect people in middle adulthood.

Middle adulthood is the time when most people become increasingly aware of the gradual changes in their bodies that mark the aging process. As we saw in Chapter 13, some of the aging that people experience is the result of *senescence*, or naturally occurring declines related to age. Other changes, however, are the result of lifestyle choices, such as diet, exercise, smoking, and alcohol or drug use. As we'll see throughout this chapter, people's lifestyle choices can have a major impact on their physical, and even cognitive, fitness during middle age.

Of course, physical changes occur throughout the entire life span. Yet these changes take on new significance during middle adulthood, particularly in Western cultures that place a high value on youthful appearance. For many people, the psychological significance of such changes far exceeds the relatively minor and gradual changes that they are experiencing. Sharon Boker-Tov had found gray hairs even in her 20s, but in her 40s they multiplied in a way that she could not ignore. She was no longer young.

People's emotional reactions to the physical changes of middle adulthood depend in part on their self-concepts. For those whose self-image is tied closely to their physical attributes—such as highly athletic men and women or those who are physically quite attractive—middle adulthood can be particularly difficult. The signs of aging they see in the mirror signal not just aging and mortality but also may lead to the perception of a reduction in physical attractiveness. Those middle-aged adults, however, whose views of themselves are not so closely tied to physical attributes, generally report no less satisfaction with their body images than younger adults (Eitel, 2003; Hillman, 2012; Murray & Lewis, 2014).

Physical appearance often plays an especially important role in determining how women see themselves. This is particularly true in Western cultures, where women face strong societal pressures to retain a youthful appearance. Society applies a double standard to men and women in terms of appearance: Whereas older women tend to be viewed in unflattering terms, aging men are more frequently perceived as displaying a maturity that enhances their stature (Harris, 1994).

HEIGHT, WEIGHT, AND STRENGTH: THE BENCHMARKS OF CHANGE. Most people reach their maximum height during their 20s and remain relatively close to that height until around age 55. At that point, people begin a "settling" process in which the bones attached to the spinal column become less dense. Although the loss of height is very slow, ultimately women average a 2-inch decline and men a 1-inch decline over the rest of the life span (Rossman, 1977; Bennani et al., 2009).

Women are more prone to a decline in height because they are at greater risk of osteoporosis. **Osteoporosis**, a condition in which the bones become brittle, fragile, and thin, is often brought about by a lack of calcium in the diet. As we discuss further in Chapter 17, although osteoporosis has a genetic component, it is one of the aspects of aging that can be affected by a person's lifestyle choices. Women—and men, for that matter—can reduce the risk of osteoporosis by maintaining a diet high in calcium (which is found in milk, yogurt, cheese, and other dairy products) and by exercising regularly (Prentice et al., 2006; Swaim, Barner, & Brown, 2008; Rizzoli & Brandi, 2014).

osteoporosis
a condition in which the bones become brittle, fragile, and thin, often brought about by a lack of calcium in the diet

During middle adulthood the amount of body fat also tends to grow in the average person. "Middle-age spread" is a visible symptom of this problem. Even those who have been relatively slim all their lives may begin to put on weight. Because height is not increasing, and actually may be declining, these weight and body fat gains lead to an increase in the number of people who become obese.

This weight gain usually doesn't have to happen. Lifestyle choices play a major role. People who maintain an exercise program during middle age tend to avoid obesity, as do individuals living in cultures where the typical life is more active and less sedentary than that of many Western cultures.

Changes in height and weight are also accompanied by declines in strength. Throughout middle adulthood, strength gradually decreases, particularly in the back and leg muscles. By the time they are 60, people have lost, on average, about 10 percent of their maximum strength. Still, such a loss in strength is relatively minor, and most people are easily able to compensate for it (Spence, 1989). Again, lifestyle choices can make a difference. People who exercise regularly are likely to feel stronger and to have an easier time compensating for any losses than those who are sedentary.

WATCH THIS VIDEO ON MYPSYCHLAB MIDDLE ADULTHOOD: HEALTH, JEFF

The Senses: The Sights and Sounds of Middle Age

LO 15.2 Explain how the senses change in middle adulthood.

Sharon Boker-Tov's experiences with needing extra light to read and holding the newspaper a little farther away are so common that reading glasses and bifocals have become almost a stereotypical emblem of middle age. Like Sharon, most people notice unmistakable changes in the sensitivity not only of their eyes but also of other sense organs. Although all the organs seem to shift at roughly the same rate, the changes are particularly noticeable in vision and hearing.

VISION. Starting at around age 40, *visual acuity*—the ability to discern fine spatial detail in both close and distant objects—begins to decline (see Figure 15-1). The shape of the eye's lens changes, and its elasticity deteriorates, which makes it harder to focus images sharply onto the retina. The lens becomes less transparent, so less light passes through the eye (DiGiovanna, 1994).

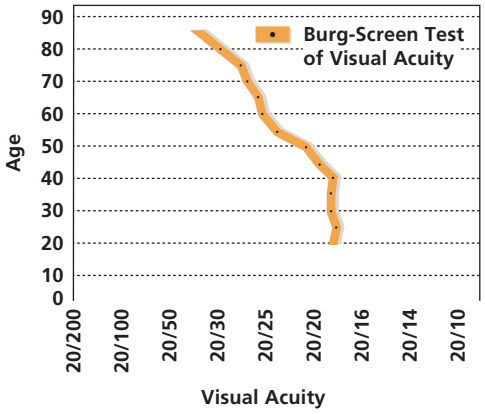
A nearly universal change in eyesight during middle adulthood is the loss of near vision, called **presbyopia**. Even people who have never needed glasses or contact lenses find themselves holding reading matter at an increasing distance from their eyes in order to bring it into focus. Eventually, they need reading glasses. For those who were previously near-sighted, presbyopia may require bifocals or two sets of glasses (Kalsi, Heron, & Charman, 2001; Koopmans & Kooijman, 2006; Kemper, 2012).

presbyopia
a nearly universal change in eyesight during middle adulthood that results in some loss of near vision

Figure 15-1 The Decline of Visual Acuity

Beginning around the age of 40, the ability to discern fine detail begins to drop.

(**Source:** Based on Pitts, 1982.)



Other changes in vision also begin in middle adulthood. There are declines in depth perception, distance perception, and the ability to view the world in three dimensions. The loss of elasticity in the lens also means that people's ability to adapt to darkness is impaired, and they are less able to see in dimly lit environments. Such visual reductions may make it more difficult to climb stairs or to navigate around a dark room (Artal et al., 1993; Spear, 1993).

Although changes in vision are most often brought about by the gradual processes of normal aging, in some cases disease is involved. One of the most frequent causes of eye problems is glaucoma, which may, if left untreated, ultimately produce blindness. **Glaucoma** occurs when pressure in the fluid of the eye increases, either because the fluid cannot drain properly or because too much is produced. Around 1 to 2 percent of people over the age of 40 are afflicted by the disorder, and African Americans are particularly susceptible (Wilson, 1989).

Initially, the increased pressure in the eye may constrict the neurons involved in peripheral vision and lead to tunnel vision. Ultimately, the pressure can become so great that all nerve cells are constricted, which causes complete blindness. Fortunately, glaucoma can be treated if it is detected early enough. Medication can reduce the pressure in the eye, as can surgery to restore normal drainage of eye fluid (Plosker & Keam, 2006; Lambiase et al., 2009).

glaucoma
a condition in which pressure in the fluid of the eye increases, either because the fluid cannot drain properly or because too much fluid is produced

HEARING. Like vision, hearing undergoes a gradual decline in acuity starting in middle adulthood. For the most part, however, the changes are less evident than those involving eyesight.

Some of the hearing losses of middle adulthood result from environmental factors. For instance, people whose professions keep them near loud noises—such as airplane mechanics and construction workers—are more apt to suffer debilitating and permanent hearing loss.

Many changes, however, are simply related to aging. For instance, age brings a loss of *cilia* or *hair cells* in the inner ear, which transmit neural messages to the brain when vibrations bend them. Like the lens of the eye, the eardrum also becomes less elastic with age, reducing sensitivity to sound (Wiley et al., 2005).

presbycusis
loss of the ability to hear sounds of high frequency

The ability to hear high-pitched, high-frequency sounds usually degrades first, a problem called **presbycusis**. About 12 percent of people between ages 45 and 65 suffer from presbycusis. There is also a gender difference: Men are more prone to hearing loss than women, starting at around age 55. People who have hearing difficulties may also have problems identifying the direction and origin of a sound, a process called *sound localization*. Sound localization can deteriorate because it depends on comparing the discrepancy in sound perceived by the two ears. For example, a sound on the right will stimulate the right ear first and then, a tiny time later, register in the left ear. Because hearing loss may not affect both ears equally, sound localization can suffer (Veras & Mattos, 2007; Gopinath et al., 2012; Koike, 2014).

Declines in sensitivity to sounds do not markedly affect most people in middle adulthood. Most people are able to compensate for the losses that do occur relatively easily—by asking people to speak up, turning up the volume of a television set, or paying greater attention to what others are saying.

Reaction Time: Not-So-Slowing Down

LO 15.3 Explain how reaction time changes during middle adulthood.

One common concern about aging is the notion that people begin to slow down once they reach middle adulthood. How valid is such a worry?

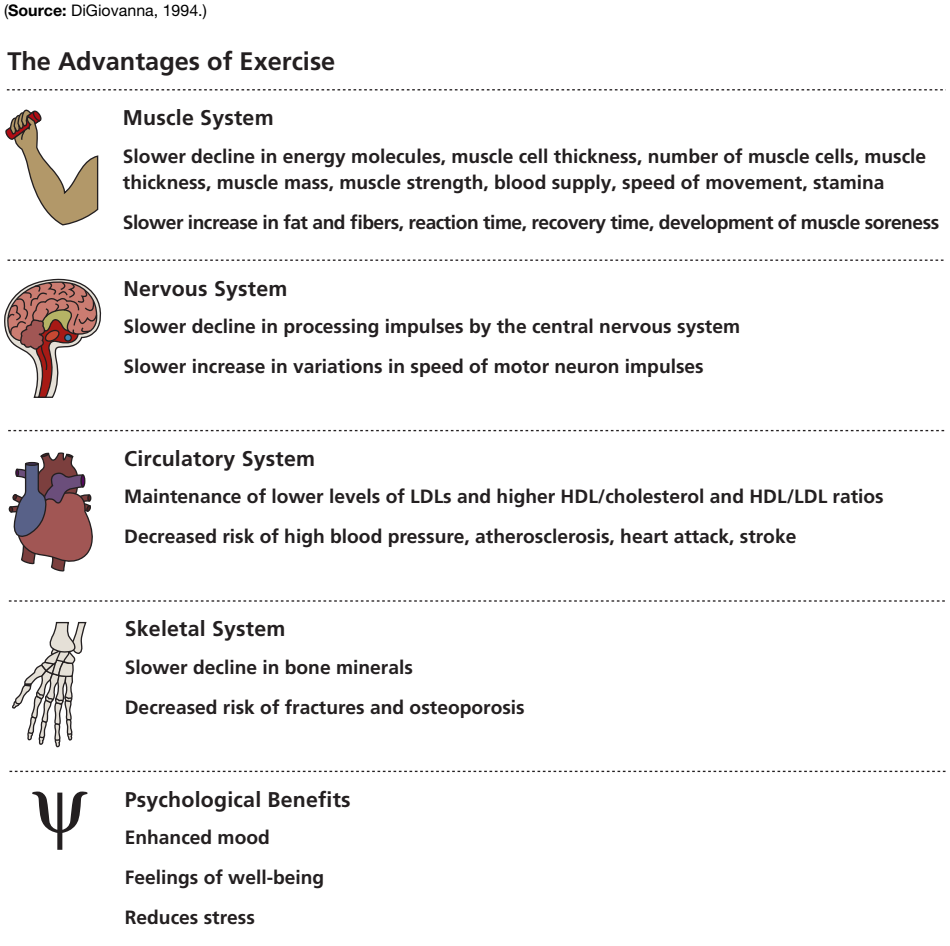
In most cases, not very. There is an increase in reaction time (meaning that it takes longer to react to a stimulus), but usually the increase is fairly mild and hardly noticeable. For instance, reaction time on simple tasks, such as reacting to a loud noise, increases by around 20 percent from age 20 to 60. More complex tasks, which require the coordination of various skills—such as driving a car—show less of an increase. Still, it takes a bit more time for drivers to move the foot from the gas pedal to the brake when they are faced with an emergency situation. Increases in reaction time are largely produced by changes in the speed with which the nervous system processes nerve impulses (Roggeveen, Prime, & Ward, 2007; Wolkorte, Kamphuis, & Zijdewind, 2014).

Despite the increase in reaction time, middle-aged drivers have fewer accidents than younger ones. Why would this be? Part of the reason is that older drivers tend to be more careful and to take fewer risks than younger ones. Much of the cause for their better performance, however, is older drivers' greater amount of practice in the skill. The minor slowing of reaction time is made up for by their expertise. In the case of reaction time, then, practice may indeed make perfect (Makishita & Matsunaga, 2008; Cantin et al., 2009; Endrass, Schreiber, & Kathmann, 2012).

Can slowing down be slowed down? In many cases, the answer is yes. Lifestyle choices once more come into play. Specifically, involvement in an active exercise program retards the effects of aging, producing several important outcomes, such as better health and improved muscle strength and endurance (see Figure 15-2). "Use it or lose it" is an aphorism with which developmentalists would agree (Conn, 2003).

Figure 15-2 The Benefits of Exercise

Many benefits accrue from maintaining a high level of physical activity throughout life.
(**Source:** DiGiovanna, 1994.)



Sex in Middle Adulthood: The Ongoing Sexuality of Middle Age

LO 15.4 Compare how middle-aged men and middle-aged women experience changes in sexuality.

Sexuality remains an important part of life for most middle-aged people. Although the frequency of sexual intercourse declines with age (see Figure 15-3), sexual pleasure remains a vital part of most middle-aged adults' lives. About half of men and women age 45 to 59 report having sexual intercourse about once a week or more. Close to three-quarters of men and more than half of women age 50 to 59 report masturbating. Half of men age 50 to 59 and a third of women in that age group have received oral sex from a different sex partner in the last year. Similarly, sex remains an important activity for gay and lesbian couples during middle adulthood (Duplassie & Daniluk, 2007; Herbenick et al., 2010; Koh & Sewell, 2014).

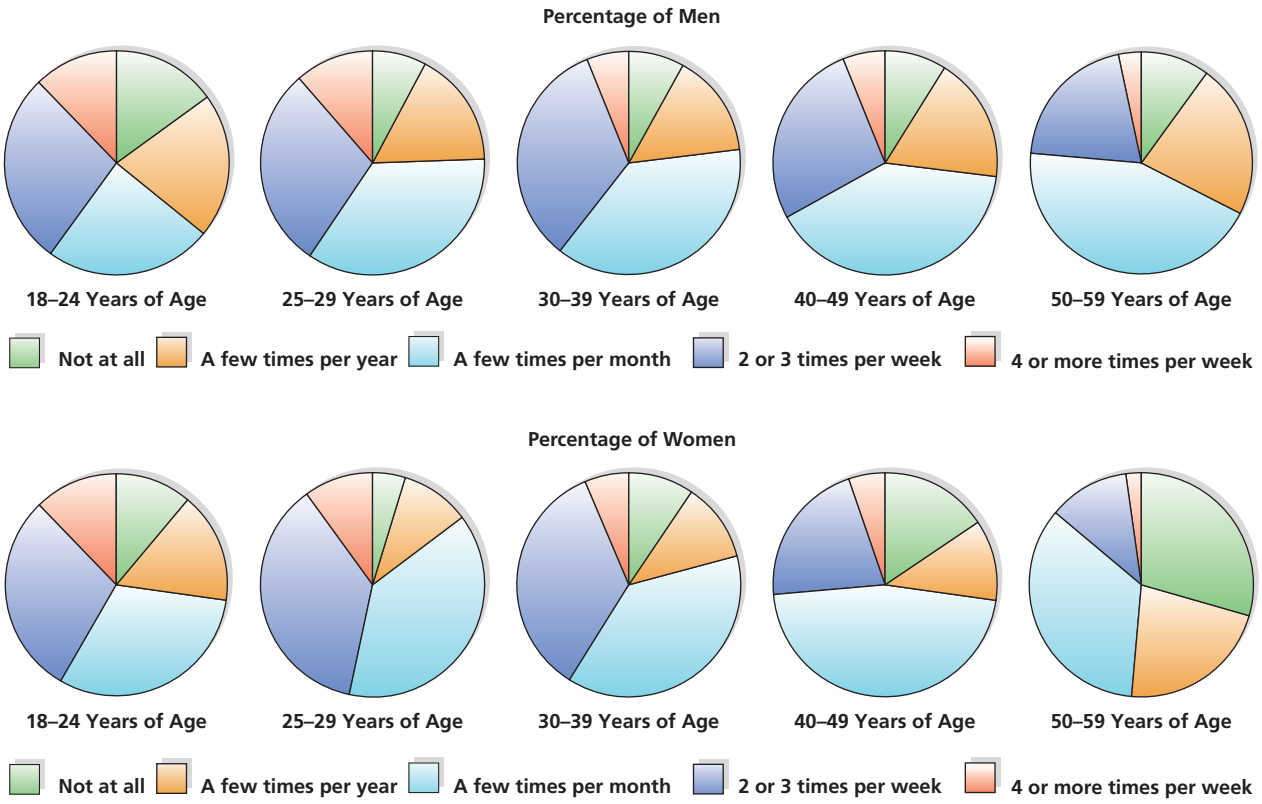
For many, middle adulthood brings a kind of sexual enjoyment and freedom that was missing during their earlier lives. With their children grown and away from home, middle-aged married couples have more time to engage in uninterrupted sexual activities. Women who have passed through menopause are liberated from the fear of pregnancy and no longer need to employ birth control techniques (Lamont, 1997; DeLamater, 2012).

Both men and women can face some challenges to their sexuality during middle adulthood. For instance, a man typically needs more time to achieve an erection, and it takes longer after an orgasm to have another. The volume of fluid that is ejaculated declines. Finally, the production of *testosterone*, the male sex hormone, declines with age (Hyde & DeLamater, 2003).

Figure 15-3 Frequency of Sexual Intercourse

As people age, the frequency of sexual intercourse declines.

(**Source:** Based on Michael et al., 1994.)



For women, the walls of the vagina become thinner and less elastic. The vagina begins to shrink and its entrance becomes compressed, which can make intercourse painful. For most women, though, the changes are not so great as to reduce sexual pleasure. Those women who do experience declines in enjoyment from sexual intercourse can find help from an increasing array of drugs, such as topical creams and testosterone patches, being developed to increase sexual pleasure (Freedman & Ellison, 2004; Nappi & Polatti, 2009; Spring, 2015).

THE FEMALE CLIMACTERIC AND MENOPAUSE. Starting at around age 45, women enter a period known as the climacteric that lasts for some 15 to 20 years. The **female climacteric** marks the transition from being able to bear children to being unable to do so.

female climacteric
the period that marks the transition from being able to bear children to being unable to do so

The most notable sign of the female climacteric is menopause. **Menopause** is the cessation of menstruation. For most women, menstrual periods begin to occur irregularly and less frequently during a two-year period starting at around age 47 or 48, although this process may begin as early as age 40 or as late as age 60. After a year goes by without a menstrual period, menopause is said to have occurred.

menopause
the cessation of menstruation

Menopause is important for several reasons. For one thing, it marks the point at which a traditional pregnancy is no longer possible (although eggs implanted in a postmenopausal woman can produce a pregnancy). In addition, the production of estrogen and progesterone, the female sex hormones, begins to drop, producing a variety of hormone-related age changes (Schwenkhagen, 2007).

The changes in hormone production may produce a variety of symptoms, although the degree to which a woman experiences them varies significantly. One of the best-known and most prevalent symptoms is "hot flashes," in which a woman senses an unexpected feeling of heat from the waist up. A woman may get red and begin to sweat when a hot flash occurs. Afterward, she may feel chilled. Some women experience hot flashes several times a day; others never experience hot flashes. In one survey, for instance, only half of the women reported experiencing hot flashes.

During menopause, headaches, feelings of dizziness, heart palpitations, and aching joints are other relatively common symptoms, though far from universal. In general, only about one-tenth of all women experience severe distress during menopause. And many—perhaps as many as half—have no significant symptoms at all (Grady, 2006; Ishizuka, Kudo, & Tango, 2008; Levin, 2015).

For many women, symptoms of menopause may begin a decade before menopause actually occurs. *Perimenopause* is the period beginning around 10 years prior to menopause when hormone production begins to change. Perimenopause is marked by sometimes radical fluctuations in hormone production, resulting in some of the same symptoms that are found in menopause.

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MENOPAUSE

Symptoms of menopause also differ by race. Compared with Caucasians, Japanese and Chinese women generally report fewer overall symptoms. African American women experience more hot flashes and night sweats, and Hispanic women report a higher level of several other symptoms, including heart pounding and vaginal dryness. Although the reason for these differences is unclear, it may be related to systematic racial differences in hormonal levels (Cain, Johannes, & Avis, 2003; Winterich, 2003; Shea, 2006).

For some women, the symptoms of perimenopause and menopause can be considerable. Treating those problems, though, has proven to be no easy task, as we consider next.

THE DILEMMA OF HORMONE THERAPY: NO EASY ANSWER

Forty-six-year-old Sara Kendrick was certain she was having a heart attack. She had been weeding her garden when suddenly she couldn't get enough air into her lungs. She felt as if she were on fire, becoming lightheaded and dizzy. A feeling of nausea came over her. She made it to the kitchen to call 911 and then fell to the floor. When the emergency team

examined her, she was both relieved and embarrassed to learn that her symptoms indicated not a heart attack but her first hot flash.

A decade ago, physicians would have had a straightforward remedy for hot flashes and other uncomfortable symptoms caused by the onset of menopause: They would have prescribed regular doses of a hormone replacement drug.

For millions of women who experienced similar difficulties, it was a solution that worked. In *hormone therapy (HT)*, estrogen and progesterone are administered to alleviate the worst of the symptoms experienced by menopausal women. HT clearly reduces a variety of problems, such as hot flashes and loss of skin elasticity. In addition, HT may reduce coronary heart disease by changing the ratio of "good" cholesterol to "bad" cholesterol. HT also decreases the thinning of the bones related to osteoporosis, which, as we discussed, becomes a problem for many people in late adulthood (McCauley, 2007; Alexandersen, Karsdal, & Christiansen, 2009; Lisabeth & Bushnell, 2012).

Furthermore, some studies show that HT is associated with reduced risks of stroke and colon cancer. Estrogen may improve memory and cognitive performance in healthy women, and reduce depression. Finally, increased estrogen may lead to a greater sex drive (Schwenkhagen, 2007; Cumming et al., 2009; Garcia-Portilla, 2009).

Although hormone therapy may sound like a cure-all, in fact since it became popular in the early 1990s, it has been well understood that there were risks involved. For instance, it seemed to increase the risk of breast cancer and blood clots. The thinking was, though, that the benefits of HT outweighed the risks. All that changed after 2002, when a large study conducted by the Women's Health Initiative determined that the long-term risks of HT outweighed the benefits. Women taking a combination of estrogen and progestin were found to be at higher risk for breast cancer, stroke, pulmonary embolism, and heart disease. Increased risk of stroke and pulmonary embolism were later found to be associated with estrogen-alone therapy (Lobo, 2009).

The results of the Women's Health Initiative study led to a profound rethinking of the benefits of HT, calling into question the wisdom that HT could protect postmenopausal women against chronic disease. Many women stopped taking hormone replacement drugs. Statistics tell the story: 40 percent of postmenopausal women in the United States were using hormone therapy in 2002; it was down to 20 percent a decade later (Newton et al., 2006; Chlebowski et al., 2009; Beck, 2012).

The sharp decline among menopausal women using HT is probably an overreaction, however. The most recent thinking among medical experts is that it's not a simple all-or-nothing proposition; some women are simply better candidates for HT than others. While HT seems to be less appropriate for older, postmenopausal women (such as those who participated in the Women's Health Initiative study) because of the increased risk of coronary heart disease and other health complications, younger women at the onset of menopause and who are experiencing severe symptoms might still benefit from the therapy, at least on a short-term basis (Rossouw et al., 2007; Lewis, 2009; Beck, 2012).

Ultimately, HT presents a risk, although one that many physicians believe is worth taking. Women nearing menopause need to read literature on the topic, consult their physicians, and ultimately come to an informed decision about how to proceed.

THE PSYCHOLOGICAL CONSEQUENCES OF MENOPAUSE. Traditionally, experts, as well as the general population, believed that menopause was linked directly to depression, anxiety, crying spells, lack of concentration, and irritability. Some researchers estimated that as many as 10 percent of menopausal women suffered severe depression. It was assumed that physiological changes in menopausal women's bodies brought about such disagreeable outcomes (DeAngelis, 2010; Mauas, Kopala-Sibley, & Zuroff, 2014).

Today, however, most researchers view menopause from a different perspective. It now seems more reasonable to regard menopause as a normal part of aging that does

not, by itself, produce psychological symptoms. Certainly, some women experience psychological difficulties, but they do at other points in life as well (Matthews et al., 2000; Freeman, Sammel, & Liu, 2004; Somerset et al., 2006).

A woman's expectations about menopause can make a significant difference in her experience of it, according to research. On one hand, women who expect to have difficulties during menopause are more likely to attribute every physical symptom and emotional swing to it. On the other hand, those with more positive attitudes toward menopause may be less apt to attribute physical sensations to menopausal physiological changes. A woman's attribution of physical symptoms, then, may affect her perception of the rigors of menopause—and ultimately her actual experience of the period (Breheny & Stephens, 2003; Bauld & Brown, 2009; Strauss, 2011).

The nature and extent of menopausal symptoms also differ according to a woman's ethnic and cultural background. Women in non-Western cultures often have vastly different menopausal experiences from those in Western cultures. For instance, women of high castes in India report few symptoms of menopause. In fact, they look forward to menopause because being postmenopausal produces several social advantages, such as an end to taboos associated with menstruation and a perception of increased wisdom due to age. Similarly, Mayan women have no notion of hot flashes, and they generally look forward to the end of their childbearing years (Robinson, 2002; Dillaway et al., 2008).

From *a health-care professional's* perspective

What cultural factors in the United States might contribute to a woman's negative experience of menopause? How?

While women in some cultures anticipate menopause with dread, Mayan women have no notion of hot flashes, and they generally look forward to the end of their childbearing years.

THE MALE CLIMACTERIC. Do men experience the equivalent of menopause? Not really. Because they have never weathered anything akin to menstruation, they would have difficulty experiencing its discontinuation. At the same time, men do experience some changes during middle age that are collectively referred to as the male climacteric. The **male climacteric** is the period of physical and psychological change in the reproductive system that occurs during late middle age, typically in a man's 50s.

male climacteric
the period of physical and psychological change relating to the male reproductive system that occurs during late middle age

Because the changes happen gradually, it is hard to pinpoint the exact period of the male climacteric. For instance, despite progressive declines in the production of testosterone and sperm, men continue to be able to father children throughout middle age. On the other hand, about 10 percent of men have atypically low levels of testosterone by the age of 50. For these men, testosterone replacement therapy is sometimes used (Fennell et al., 2009).

One physical change that does occur quite frequently is enlargement of the *prostate gland*. By the age of 40, around 10 percent of men have enlarged prostates, and the percentage increases to half of all men by the age of 80. Enlargement of the prostate produces problems with urination, including difficulty starting urination or a need to urinate frequently at night.

Furthermore, sexual problems increase as men age. In particular, *erectile dysfunction*, in which men are unable to achieve or maintain an erection, becomes more common. Drugs such as Viagra, Levitra, and Cialis, as well as patches that deliver doses of the hormone testosterone, often are effective in treating the problem (Kim & Park, 2006; Abdo et al., 2008; Glina, Cohen, & Vieira, 2014).

Although the physical changes associated with middle age are unequivocal, it's not clear whether they are the direct cause of any particular psychological symptoms or changes. Men, like women, clearly undergo psychological development during middle adulthood, but the extent to which psychological changes—which we discuss more in the next chapter—are associated with changes in reproductive or other physical capabilities remains an open question.

Module 15.1 Review

- People in middle adulthood experience gradual changes in physical characteristics and appearance.
- The acuity of the senses, particularly vision and hearing, decline slightly during middle age.
- Reaction time slows slightly during middle adulthood, but this decline is compensated for by increased care and expertise and a decrease in risk-taking.
- Sexuality in middle adulthood changes slightly, but middle-aged couples, freed from concerns about children, can often progress to a new level of intimacy and enjoyment. Physiological changes relating to sexuality occur in both men and women. Both the female climacteric, which includes menopause, and the male climacteric seem to have physical and perhaps psychological symptoms.

Journal Writing Prompt

Applying Lifespan Development: Would you rather fly on an airplane with a middle-aged pilot or a young one? Why?

Health

It was an average exercise session for Jerome Yanger. After the alarm went off at 5:30 a.m., he climbed onto his exercise bike and began vigorously peddling, trying to maintain, and exceed, his average speed of 14 miles per hour. Stationed in front of the television set, he used the remote control to tune to the morning business news. Occasionally glancing up at the television, he began reading a report he had not finished the night before, swearing under his breath at some of the poor sales figures he was seeing. By the time he had completed exercising a half-hour later, he had gotten through the report, had managed to sign a few letters his administrative assistant had typed for him, and had even left two voice-mail messages for some colleagues.

Most of us would be ready to head back to bed after such a packed half-hour. For Jerome Yanger, however, it was routine: He consistently tried to accomplish several activities at the same time. Jerome thought of such behavior as efficient. Developmentalists might view it in another light, however: as symptomatic of a style of behavior that makes Jerome a likely candidate for coronary heart disease.

Although most people are relatively healthy in middle adulthood, they also become increasingly susceptible to a variety of health-related concerns. We will consider some of the typical health problems of middle age, focusing in particular on coronary heart disease and cancer.

Wellness and Illness: The Ups and Downs of Middle Adulthood

LO 15.5 Describe changes in health that occur in middle adulthood.

Health concerns become increasingly important to people during middle adulthood. Surveys asking adults what they worry about show that health—as well as safety and money—is an issue of concern. For instance, more than half of adults surveyed say they are either "afraid" or "very afraid" of having cancer (see Figure 15-4).

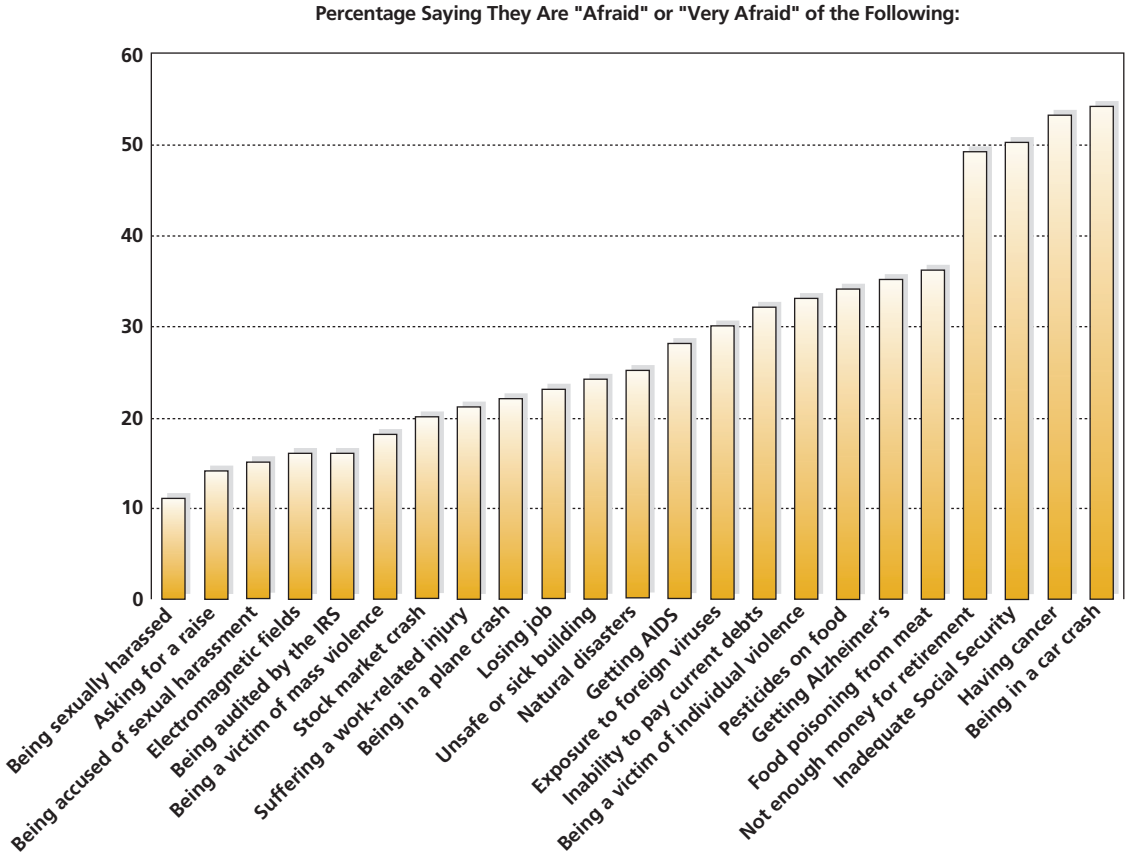
For most people, however, middle age is a period of health. According to census figures, the vast majority of middle-aged adults report no chronic health difficulties and face no limitations on their activities.

Actually, in some ways people are better off, healthwise, in middle adulthood than in earlier periods of life. People between the ages of 45 and 65 are less likely than younger adults to experience infections, allergies, respiratory diseases, and digestive problems. They may contract fewer of these diseases now because they may have already experienced them and built up immunities during younger adulthood.

Figure 15-4 Worries of Adulthood

As people enter middle adulthood, health and safety concerns become increasingly important, followed by financial worries.

(**Source:** *USA Weekend*, 1997.)



Certain chronic diseases do begin to appear during middle adulthood. Arthritis typically begins after the age of 40, and type 2 diabetes is most likely to occur in people between the ages of 50 and 60, particularly if they are overweight. Hypertension (high blood pressure) is one of the most frequent chronic disorders found in middle age. Sometimes called the "silent killer" because it is symptomless, hypertension, if left untreated, greatly increases the risk of strokes and heart disease. For such reasons, a variety of preventive and diagnostic medical tests are routinely recommended for adults during middle adulthood (Walters & Rye, 2009; see Table 15-1).

As a result of the onset of chronic diseases, the death rate among middle-aged individuals is higher than it is in earlier periods of life. Still, death remains a rare occurrence: Statistically, only three out of every hundred 40-year-olds would be expected to die before the age of 50, and eight out of every hundred 50-year-olds would be expected to die before the age of 60. Furthermore, the death rate for people between 40 and 60 has declined dramatically over the past 75 years. For instance, the death rate now stands at just half of what it was in the 1940s. There also are socioeconomic status and gender variations in health, as we consider in the *Developmental Diversity and Your Life* box (Smedley & Syme, 2000).

STRESS IN MIDDLE ADULTHOOD. Stress continues to have a significant impact on health during middle adulthood, as it did in young adulthood, although the nature of what is stressful may have

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Table 15-1 Adult Preventive Health-Care Screening Recommendations

These are general guidelines for healthy adults who have no symptoms of disease.

Screening	Description	Ages 40–49	Ages 50–59	Age 60+
		ALL ADULTS		
BLOOD PRESSURE	Used to detect hypertension, which can lead to heart attack, stroke, or kidney disease.	Every 2 years.	Every 2 years.	Every 2 years; Every year if family history of hypertension.
CHOLESTEROL—TOTAL/HDL	Used to detect high cholesterol levels, which increase risk of heart disease.	All adults should receive total cholesterol screening, HDL cholesterol, LDL cholesterol, and triglycerides AT LEAST ONCE; Cardiac risk factors and lipoprotein results will determine frequency of follow-up by your health-care provider.		
EYE EXAMINATION	Used to determine if glasses required and check for eye disease.	Every 2–4 years; Diabetics—Every year.	Every 2–4 years; Diabetics—Every year.	Every 2–4 years; At age 65 and over, every 1–2 years; Diabetics—Every year.
FLEXIBLE SIGMOIDOSCOPY OR DOUBLE CONTRAST BARIUM ENEMA OR COLONOSCOPY	A procedure using a scope or x-ray to detect cancer of the colon and rectum.		Baseline at age 50; Every 3–5 years after initial test.	Every 3–5 years. Age to stop depends on health; Follow up normal colonoscopy in 8–10 yrs.
FECAL OCCULT BLOOD SCREENING	Detects unseen blood in stool, which is early warning sign for colon cancer.		Every year.	Every year.
RECTAL EXAM (DIGITAL)	Examination of prostate or ovaries to detect cancer.		Every year.	Every year.
URINALYSIS SCREENING	Examination to detect presence of excess protein in urine.	Every 5 years.	Every 5 years.	Every 3–5 years.
IMMUNIZATIONS (SHOTS): TETANUS	Protection against infection after injury.	Every 10 years.	Every 10 years.	Every 10 years.
INFLUENZA (FLU)	Protection against the influenza virus.	Any person with chronic medical conditions, such as heart, lung, kidney disease, diabetes.	Annually, age 50 and over.	Annually, age 65 and over.
PNEUMOCOCCAL	Protection against pneumonia.			At age 65; then every 6 years.
		ADDITIONAL GUIDELINES FOR WOMEN		
BREAST SELF-EXAM/BREAST EXAM BY PROVIDER	Examination to detect changes in breast that may indicate cancer.	Every month/Every year.	Every month/ Every year.	Every month/Every year.
MAMMOGRAM	Low-dose x-ray used to locate tumors for early detection of breast cancer.	Every year.	Every year.	Every year.
PAP SMEAR	Test that takes small sample of cells to detect cervical cancer or precancer cells.	After 3 normal tests in a row, screen every 2–3 years unless at special risk.	After 3 normal tests in a row, screen every 2–3 years unless at special risk.	Women 70 and older with 3 normal tests in a row and no abnormal tests in the 10 years prior to age 70 may cease having Pap test.
PELVIC EXAM	Examination to detect pelvic abnormality.	Every year (if ovaries remain after hysterectomy).	Every year (if ovaries remain after hysterectomy).	Every year (if ovaries remain after hysterectomy).
		ADDITIONAL GUIDELINES FOR MEN		
PROSTATE-SPECIFIC ANTIGEN	Blood test used to detect cancer of the prostate gland.	Positive family history cancer—every year; (African Americans—every year).	Every year upon doctor's advice.	Until age 75, every year upon doctor's advice.
TESTICULAR SELF-EXAM	Examination to detect changes in testicles that may indicate cancer.	Every month.	Every month.	Every month.

Developmental Diversity and Your Life

Individual Variation in Health: Socioeconomic Status and Gender Differences

Masked by the overall figures describing the health of middle-aged adults are vast individual differences. While most people are relatively healthy, some are beset by a variety of ailments. Part of the cause is genetic. For instance, hypertension often runs in families.

Some of the causes of poor health are related to social and environmental factors. For instance, the death rate for middle-aged African Americans in the United States is twice the rate for Caucasians. Why should this be true?

Socioeconomic status (SES) seems to play a large role. For instance, when whites and African Americans of the same SES level are compared, the death rate for African Americans actually falls below that of whites. The lower a family's income, the more likely it is that a member will experience a disabling illness. There are a number of reasons for this. People living in lower SES households are more apt to work in occupations that are dangerous, such as mining or construction work. Lower income also often translates into inferior health-care coverage. In addition, the crime rates and environmental pollutants are generally higher in lower-income neighborhoods. Ultimately, then, a higher incidence of accidents and health hazards, and thus a higher death rate, are linked to lower levels of income (Dahl & Birkelund, 1997; Hendren, Humiston, & Fiscella, 2012; see Figure 15-5).

Gender, like socioeconomic status, also makes a difference in health. Even though women's overall mortality rate is lower than men's—a trend that holds true from the time of infancy—the incidence of illness among middle-aged women is higher than it is among men.

Women are more likely to experience minor, short-term illness and chronic, but non-life-threatening diseases, such as migraine headaches, and men are more apt to experience more serious illnesses, such as heart disease. Furthermore, the rate of cigarette smoking is lower among women than men, which reduces their susceptibility to cancer and heart disease; women drink less alcohol than men, which reduces the risk of cirrhosis of the liver and auto accidents; and they tend to work at less dangerous jobs.

Another possible reason for the higher incidence of illness in women may be the greater medical research targeted toward men and the types of disorders from which they suffer. The vast majority of medical research money is aimed at preventing life-threatening diseases faced mostly by men rather than at chronic conditions, such as heart disease that may cause disability and suffering but not necessarily death. Typically, when research is carried out on diseases that strike both men and women, much of it has focused on men as subjects rather than on women. Although this bias is now being addressed in initiatives announced by the U.S. National Institutes of Health, the historical pattern has been one of gender discrimination by the traditionally male-dominated research community (Vidaver et al., 2000).

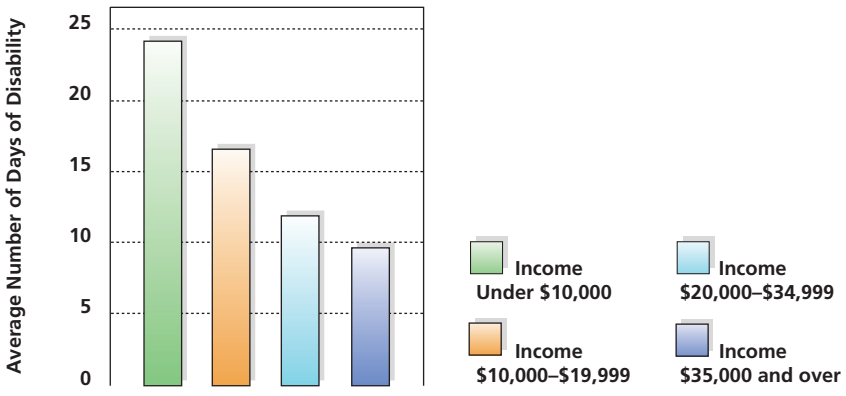


Figure 15-5 Disability and Income Level

Workers living in poverty are more likely to become disabled than those with higher income levels. Why?

(**Source:** U.S. Bureau of the Census, 1990b.)

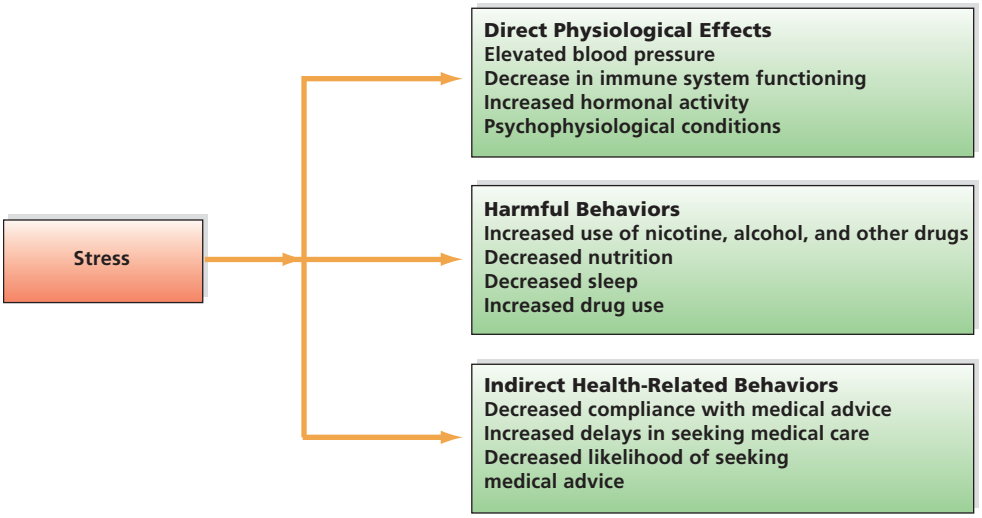
changed. For example, parents may experience stress over their adolescent children's potential drug use rather than worry about whether their toddler is ready to give up his pacifier.

No matter what events trigger stress, the results are similar. As we first discussed in Chapter 13, *psychoneuroimmunologists*, who study the relationship among the brain, the immune system, and psychological factors, note that stress produces three main consequences, summarized in Figure 15-6. First, stress has direct physiological outcomes, ranging from increased blood pressure and hormonal activity to decreased immune system

Figure 15-6 The Consequences of Stress

Stress produces three major consequences: direct physiological effects, harmful behaviors, and indirect health-related behaviors.

(**Source:** Adapted from Baum, 1994.)



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response. Second, stress also leads people to engage in unhealthy behaviors, such as cutting back on sleep, smoking, drinking, or taking other drugs. Finally, stress has indirect effects on health-related behavior. People under a lot of stress may be less likely to seek out good medical care, exercise, or comply with medical advice (Dagher et al., 2009; Ihle et al., 2012; de Frias & Whyne, 2015). All of these can lead to or affect serious health conditions, including such major problems as heart disease.

The A's and B's of Coronary Heart Disease: Linking Health and Personality

LO 15.6 Describe the risk factors related to coronary heart disease.

More men die in middle age from diseases relating to the heart and circulatory system than from any other cause. Women are less vulnerable, as we'll see, but they are not immune. Each year such diseases kill around 151,000 people under the age of 65, and they are responsible for more loss of work and disability days due to hospitalization than any other cause (American Heart Association, 2010).

RISK FACTORS FOR HEART DISEASE. Although heart and circulatory diseases are a major problem, they are not an equal threat for all people—some people have a much lower risk than others. For instance, the death rate in some countries, such as Japan, is only a quarter of the rate in the United States. In fact, the United States is in the top 10 countries with the highest death rates due to cardiovascular disease for women and men (see Figure 15-7). Why should this be true?

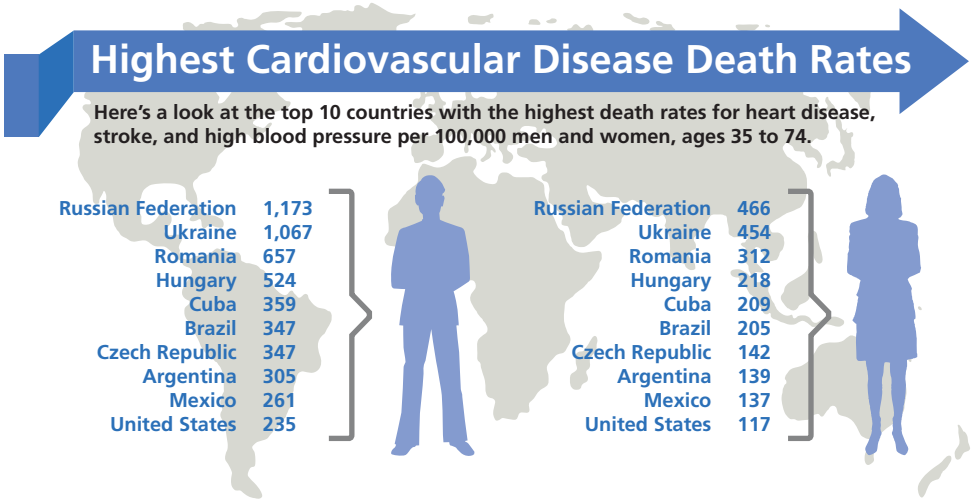
The answer is that both genetic and experiential characteristics are involved. Some people seem genetically predisposed to develop heart disease. If a person's parents suffered from it, the likelihood is greater that she or he will too. Similarly, sex and age are risk factors: Men are more likely to suffer from heart disease than women, and the risk rises as people age.

However, environment and lifestyle choices are also important. Cigarette smoking, a diet high in fats and cholesterol, and a relative lack of physical exercise all increase the likelihood of heart disease. Such factors may explain country-to-country variations in the

Figure 15-7 Death from Heart Disease Worldwide

The risk of dying from cardiovascular disease differs significantly depending on the country in which one lives. What cultural or environmental factors might help to explain this fact?

(**Source:** American Heart Association, 2015.)



incidence of heart disease. For example, the death rate attributable to heart disease in Japan is relatively low and may be due to differences in diet: The typical diet in Japan is much lower in fat than the typical diet in the United States (De Meersman & Stein, 2007; Scarborough et al., 2012; Platt et al., 2014).

But diet is not the only factor. Psychological factors, particularly those related to the perception and experience of stress, appear to be associated with heart disease. In particular, a set of personality characteristics appears to be related to the development of middle-aged adults' coronary heart disease—the Type A behavior pattern.

TYPE A'S AND TYPE B'S. For a certain proportion of adults, waiting patiently in a long line at the grocery store is a near impossibility. Sitting in their cars at a long red light makes them seethe. And an encounter with a slow, inept clerk at a retail store turns them furious.

People like this—and those similar to Jerome Yanger, who uses his exercise program as an opportunity to accomplish more work—have a set of characteristics known as the Type A behavior pattern. The **Type A behavior pattern** is characterized by competitiveness, impatience, and a tendency toward frustration and hostility. Type A people are driven to accomplish more than others, and they engage in *polyphasic activities*—multiple activities carried out simultaneously. They are the true multitaskers whom you might see talking on their phones while working on their laptop computers while riding the commuter train—and eating breakfast. They are easily angered and become both verbally and nonverbally hostile if they are prevented from reaching a goal they seek to accomplish.

Type A behavior pattern
behavior characterized by competitiveness, impatience, and a tendency toward frustration and hostility

In contrast to the Type A behavior pattern, many people have virtually the opposite characteristics in a pattern known as the Type B behavior pattern. The **Type B behavior pattern** is characterized by noncompetitiveness, patience, and a lack of aggression. In contrast to Type A's, Type B's experience little sense of time urgency, and they are rarely hostile.

Type B behavior pattern
behavior characterized by noncompetitiveness, patience, and a lack of aggression

Most people are not purely Type A's or Type B's. In fact, Type A and Type B represent the ends of a continuum, with most people falling somewhere in between the two endpoints. Still, most people come closer to one or the other of the two categories. Which category a person falls into is of some importance, particularly by middle adulthood, because a great deal of research suggests that the distinction is related to the incidence of coronary heart disease. For example, Type A men have twice the rate of coronary heart disease, a greater number of fatal heart attacks, and five times as many heart problems overall as Type B men (Rosenman, 1990; Wielgosz & Nolan, 2000).

In addition to being characterized as competitive, people with Type A personalities also tend to engage in polyphasic activities, or doing a number of things at once. Does a Type A personality deal with stress differently than a Type B personality?

Although it is not certain why Type A behavior increases the risk of heart problems, the most likely explanation is that when Type A's are in stressful situations, they become excessively aroused physiologically. Heart rate and blood pressure rise, and production of the hormones epinephrine and norepinephrine increases. The wear and tear on the body's circulatory system is what seems to ultimately produce coronary heart disease (Williams, Barefoot, & Schneiderman, 2003).

It's important to note that not every component of the Type A behavior pattern is harmful. The key component that links Type A behavior and heart disease is *hostility*. Furthermore, the links between Type A behavior and coronary heart disease are correlational. No definitive evidence has been found that Type A behavior *causes* coronary heart disease. In fact, some evidence suggests that only certain components of Type A behavior are most involved in producing disease, and not the entire constellation of behaviors associated with the pattern. For instance, there is a growing consensus that the hostility and anger related to the Type A behavior pattern may be the central link to coronary heart disease (Demaree & Everhart, 2004; Eaker et al., 2004; Kahn, 2004; Myrtek, 2007).

Although the relationship between at least some Type A behaviors and heart disease is clear, this does not mean that all middle-aged adults who can be characterized as Type A's are destined to suffer from coronary heart disease. For one thing, almost all the research conducted to date has focused on men, primarily because the incidence of coronary heart disease is much higher for males than for females. In addition, other types of negative emotions besides the hostility found in Type A behavior have been linked to heart disease. For example, psychologist Johan Denollet has identified behavior he calls *Type D*—for "distressed"—that is linked to coronary heart disease. He believes that insecurity, anxiety, and having a negative outlook put people at risk for heart attacks (Denollet, 2005; Schiffer et al., 2008; Pedersen et al., 2009).

The Threat of Cancer

LO 15.7 Summarize what causes cancer and what tools are available to diagnose and treat it.

Brenda surveyed the crowd as she stood in line to start the annual "Race for the Cure," a running and walking event that raised funds to fight breast cancer. It was a sobering sight. She spotted a group of five women, all wearing the bright pink shirts that marked them as cancer survivors. Several other racers had photos of loved ones who had lost their battles with the disease pinned to their jerseys.

Few diseases are as frightening as cancer, and many middle-aged individuals view a cancer diagnosis as a death sentence. Although the reality is different—many forms of cancer respond quite well to medical treatment, and two-thirds of people diagnosed with the disease are still alive five years later—the disease raises many fears. And there is no denying that cancer is the second-leading cause of death in the United States (CDC, 2015).

The precise trigger for cancer is still not known, but the process by which cancer spreads is straightforward. For some reason, particular cells in the body begin to multiply uncontrollably and rapidly. As they increase in number, these cells form tumors. If left unimpeded, they draw nutrients from healthy cells and body tissue. Eventually, they destroy the body's ability to function properly.

Like heart disease, cancer is associated with a variety of risk factors, some genetic and others environmental. Some kinds of cancer have clear genetic components. For example, a family history of breast cancer—which is the most common cause of cancer death among women—raises the risk for a woman.

Several environmental and behavioral factors are also related to the risk of cancer. For instance, poor nutrition, smoking, alcohol use, exposure to sunlight, exposure to radiation, and particular occupational hazards (such as exposure to certain chemicals or asbestos) are all known to increase the chances of developing cancer.

From *a health-care professional's* perspective

Does the effect of psychological attitude on cancer survival suggest that nontraditional healing techniques—such as the use of meditation—might have a place in cancer treatment? Why or why not?

After a diagnosis of cancer, several forms of treatment are possible, depending on the type of cancer. One treatment is *radiation therapy*, in which the tumor is the target of radiation designed to destroy it. Patients undergoing *chemotherapy* ingest controlled doses of toxic substances meant, in essence, to poison the tumor. Finally, surgery may be used to remove the tumor (and often the surrounding tissue). The exact form of treatment is a result of how far the cancer has spread throughout a patient's body when it is first identified.

Because early cancer detection improves a patient's chances, diagnostic techniques that help identify the first signs of cancer are of great importance. This is particularly true during middle adulthood, when the risk of contracting certain kinds of cancer increases.

Consequently, physicians urge that women routinely examine their breasts and men regularly check their testicles for signs of cancer. In addition, cancer of the prostate gland, which is the most frequent type of cancer in men, can be detected by routine rectal exams and by a blood test to identify the presence of prostate-specific antigen (PSA).

Mammograms, which provide internal scans of women's breasts, also help identify early-stage cancer. However, the question of when women should begin to routinely have the procedure has been controversial. As shown in Figure 15-8, the risk of breast cancer begins to grow at around the age of 30 and then becomes increasingly more likely (SEER, 2014).

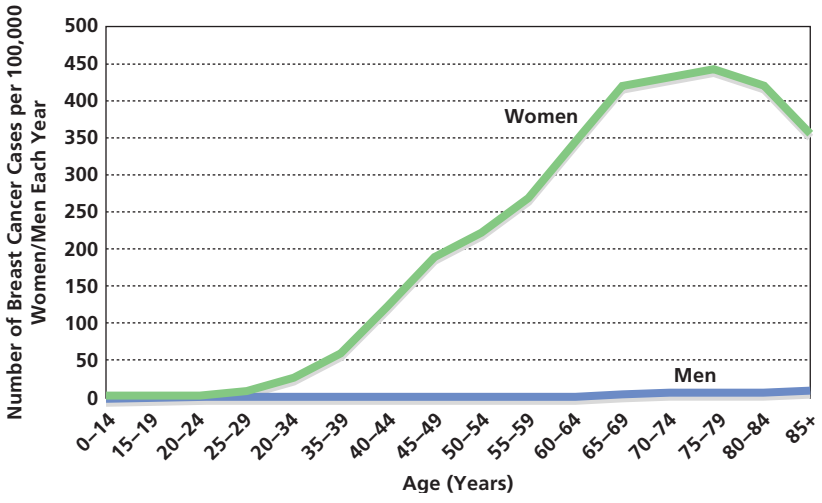
Determining the age to begin routine screening mammograms is complicated by two considerations. First, there is the problem of *false positives*, instances in which the test suggests something is wrong when in fact there is no problem. Because the breast tissue of younger women is denser than that of older women, younger women are more likely to have false positives. Some estimates suggest that as many as a third of all younger women who have repeated mammograms are likely to have a false positive that necessitates further testing or a biopsy. Furthermore, the opposite problem also may occur: *false negatives*, in which a mammogram does not detect indications of cancer (Wei et al., 2007; Destounis et al., 2009; Elmore et al., 2009).

In what proved to be a controversial proposal, the U.S. Preventive Services Task Force, a panel appointed by the government, recommended in 2009 that women in their 40s should *not* routinely have mammograms, and that women between the ages of 50 and 74 should have mammograms every two years, rather than annually. Their recommendation was based on a cost-benefit analysis showing that the risks of mammograms could be cut in half while still offering 80 percent of the benefits of annual mammograms (Nelson et al., 2009).

Figure 15-8 Age and the Risk of Breast Cancer

Starting around the age of 30, the risk of breast cancer becomes increasingly likely, as these annual incidence figures show.

(**Source:** SEER, 2014.)



Their recommendation was immediately criticized by several major women's groups, along with the American Cancer Society and American College of Radiology. They argued that women aged 40 and above should receive annual screenings (Grady, 2009).

Ultimately, the determination of the timing of screenings is a highly personal one. Women should consult their health-care providers and discuss the latest research regarding the frequency of mammograms. And for certain women, who have a history of breast cancer in their families or a mutation in a gene called BRCA, the evidence is clear that mammograms starting at age 40 are beneficial (Grady, 2009; Alonso et al., 2012; Smith, Duffy, & Tabar, 2012). (Also see the From Research to Practice box.)

From Research to Practice

Is Genetic Testing for Serious Diseases a Good Idea?

In 2013, actress Angelina Jolie surprised a great many people when she announced in a *New York Times* article that she would be undergoing a double mastectomy. The reason for her pending surgery was more surprising still. It was not that she had breast cancer; in fact, she didn't. It was that she was very likely to develop it at some point in her lifetime. Jolie, whose own mother died of ovarian cancer in her mid-fifties, had requested a genetic test that revealed the presence of a rare mutation in a gene that helps suppress tumors. Its presence meant that Jolie's risk of breast cancer was nearly 90 percent. Fearing the early demise her mother suffered, Jolie made the very personal decision to have a preventative double mastectomy, which reduced her risk of breast cancer to just 5 percent (Kluger & Park, 2013).

Today thousands of genetic tests are available that can help determine the inherited risk of many specific diseases. Jolie's very public experience will no doubt inspire many people to pursue such testing in the hope of warding off serious diseases that they are at high risk of developing, just as Jolie did.

But the outcome is often not as clear as hers was. Many diseases are associated with multiple gene variants, complicating the results. Sometimes the test reveals a mutation that has an unknown impact on disease risk. And often there are environmental and lifestyle risk factors that are just as important as genetic ones. Even when a test does show an unambiguous elevated risk due to genetic factors, it's not at all a given that a safe and effective preventative strategy exists—having the option of a double mastectomy to prevent breast cancer is much more the exception than the rule (Vassy & Meigs, 2012; Antoniou et al., 2014).

Medical experts are therefore concerned about the publicity genetic testing is getting and whether it provides a full and accurate picture of what the testing can and cannot do. People are often much more easily swayed by vivid anecdotal experiences of people they know than by dry statistics. Important health-care decisions may be made more on the basis of fear than any real understanding of actual risk. Surgery made sense in Jolie's case, but even she had other options, such as preventative chemotherapy or just frequent monitoring for early signs of abnormality. Appropriate counseling is essential to ensure that test results are interpreted realistically and options are fully understood (Riley et al., 2012).

Angelina Jolie underwent a double mastectomy to decrease her risk of developing breast cancer.

Then there's the cost issue. It's one thing for an elite Hollywood actress to get genetic testing and subsequent preventative and restorative surgeries and follow-up care. It can be quite another for the rest of us. Genetic testing is expensive, and insurance companies are reluctant to cover it without reason, such as a family history of the disease. Even when preventative interventions are possible, they might not be affordable—and they certainly come with their own risks and downsides. Many issues therefore need to be considered carefully before making the decision to seek genetic testing; Angelina Jolie's bold decision worked out well for her, but everyone's case is different (Riley et al., 2012; Kluger & Park, 2013).

Shared Writing Prompt

Why might someone want to know his or her risk of developing a serious disease if little can be done to prevent it? Would you want to know your own risk? Why or why not?

PSYCHOLOGICAL FACTORS RELATING TO CANCER: MIND OVER TUMOR? Some evidence suggests that cancer is related not only to physiological causes but to psychological factors as well. For example, some research indicates that the emotional responses of people with cancer can influence their recovery. In one study, for instance, women who showed a "fighting spirit" coped with their cancer. On the other hand, long-term survival rates do not seem better for patients who have a positive attitude compared with those with a less positive attitude. For the moment, then, the jury is out in terms of the degree to which psychological factors affect cancer (Rom, Miller, & Peluso, 2009).

Personality factors may also play a role in cancer. For example, cancer patients who are habitually optimistic report less physical and psychological distress than those who are less optimistic (Gerend, Aiken, & West, 2004; Shelby et al., 2008; Cassileth, 2014).

Related to the idea that psychological factors can help prevent or improve cancer treatment success is evidence that participation in psychological therapy may give cancer patients an edge in treatment. For example, one study found that women in the advanced stages of breast cancer who participated in group therapy lived at least 18 months longer than those who did not participate in therapy. Furthermore, the women who participated also experienced less anxiety and pain (Spiegel & Giese-Davis, 2003; Spiegel, 1996, 2011).

How, exactly, might a person's psychological state be linked to his or her prognosis with cancer? Cancer treatment is intricate, complex, and often unpleasant. It may be that patients who have the most positive attitudes and are involved in therapy might be more likely to adhere to medical treatments. Consequently, such patients are more likely to experience treatment success (Sheridan & Radmacher, 2003; Sephton et al., 2009).

There's another possibility: It may be that a positive psychological outlook bolsters the body's immune system, the natural line of defense against disease. A positive outlook may energize the immune system to produce "killer" cells that fight the cancerous cells. In contrast, negative emotions and attitudes may impair the ability of the body's natural killer cells to fight off the cancer (Ironson & Schneiderman, 2002; Gidron et al., 2006).

It is important to keep in mind that the link between attitudes, emotions, and cancer is far from proven. Furthermore, it is unjustified and unfair to assume that a cancer patient would be doing better if only he or she had a more positive attitude. What the data do suggest is that psychological therapy might be warranted as a routine component of cancer treatment, even if it does nothing more than improve the patient's psychological state and raise his or her morale (Kissane & Li, 2008; Coyne et al., 2009; Hart et al., 2012; Bower et al., 2014).

Although some studies suggest that the degree of social support in a person's life may be related to a decreased risk of cancer, the link between attitudes, emotions, and cancer is far from proven.

Module 15.2 Review

- In general, middle adulthood is a period of good health, although susceptibility to chronic diseases, such as arthritis, type 2 diabetes, and hypertension, increases.
- Heart disease is a risk for middle-aged adults. Both genetic and environmental factors contribute to heart disease, including the Type A behavior pattern.
- The incidence of cancer begins to be significant in middle adulthood. Therapies such as radiation therapy, chemotherapy, and surgery can successfully treat cancer, and psychological factors, such as a fighting attitude and a refusal to accept the finality of cancer, can influence survival rates.

Journal Writing Prompt

Applying Lifespan Development: What social policies might be developed to lower the incidence of disabling illness among members of lower socioeconomic groups?

Cognitive Development

It began innocently enough. Forty-five-year-old Bina Clingman couldn't remember whether she had mailed the letter that her husband had given her, and she wondered, in passing, whether this was a sign of aging. The very next day, her feelings were reinforced when she had to spend 20 minutes looking for a phone number that she knew she had written down on a piece of paper—somewhere. By the time she had found it, she was surprised and even a little anxious. "Am I losing my memory?" she asked herself, with both annoyance and some degree of concern.

Many people in their 40s will tell you that they feel more absentminded than they did 20 years earlier and that they harbor at least some concern about becoming less mentally able than when they were younger. Common wisdom suggests that people lose some mental sharpness as they age. But how accurate is this notion?

Does Intelligence Decline in Adulthood?

LO 15.8 Describe what happens to a person's intelligence in middle adulthood.

For years, experts provided a clear, unwavering response when asked whether intelligence declined during adulthood. It was a response that most adults were not happy to hear: Intelligence peaks at age 18, stays fairly steady until the mid-twenties, and then begins a gradual decline that continues until the end of life.

Today, however, developmentalists have come to see that the answers to questions about changes in intelligence across the life span are more complicated—and they have come to different, and more complex, conclusions.

THE DIFFICULTIES IN ANSWERING THE QUESTION. The conclusion that intelligence starts to diminish in the mid-twenties was based on extensive research. In particular, *cross-sectional studies*—which test people of different ages at the same point in time—clearly showed that older subjects were more likely to score less well than younger subjects on traditional intelligence tests.

But consider the drawbacks of cross-sectional research—in particular the possibility that it may suffer from cohort effects. Recall that *cohort effects* are influences associated with growing up at a particular historical time that affect persons of a particular age. For instance, suppose that compared to the younger people, the older people in a cross-sectional study had had less adequate educations, were exposed to less stimulation in their jobs, or were relatively less healthy. In that case, the lower IQ scores of the older group could hardly be attributed solely, or perhaps even partially, to differences in intelligence between younger and older individuals. In sum, because they do not control for cohort effects, cross-sectional studies may well *underestimate* intelligence in older subjects.

In an effort to overcome the cohort problems of cross-sectional studies, developmentalists began to turn to *longitudinal studies*, in which the same people are studied periodically over a span of time. These studies began to reveal a different developmental pattern for intelligence: Adults tended to show fairly stable and even increasing intelligence test scores until they reached their mid-thirties, and in some cases up to their fifties. At that point, though, scores began to decline (Bayley & Oden, 1955).

But let's step back a moment and consider the drawbacks of longitudinal studies. For instance, people who take the same intelligence test repeatedly may perform better simply because they become more familiar—and comfortable—with the testing situation. Similarly, because they have been exposed to the same test regularly over the years, they may even begin to remember some of the test items. Consequently, practice effects may account for the relatively superior performance of people on longitudinal measures of intelligence as opposed to cross-sectional measures (Salthouse, 2009).

Furthermore, it is difficult for researchers using longitudinal studies to keep their samples intact. Participants in a study may move away, decide they no longer want to participate, or become ill and die. As time goes on, the participants who remain in the study may represent a healthier, more stable, and more psychologically positive group of people than those who are no longer part of the sample. If this is the case, then longitudinal studies may mistakenly *overestimate* intelligence in older subjects.

It is difficult to evaluate cognitive abilities in middle adulthood. While some types of mental abilities may begin to decline, other types hold steady and actually may increase.

CRYSTALLIZED AND FLUID INTELLIGENCE. The ability of developmentalists to draw conclusions about age-related changes in intelligence faces still more hurdles. For instance, many IQ tests include sections based on physical performance, such as arranging a group of blocks. These sections are timed and scored on the basis of how quickly a question is completed. If older people take longer on physical tasks—and remember that reaction time slows with age, as we discussed earlier in the chapter—then their poorer performance on IQ tests may be a result of physical rather than cognitive changes.

To complicate the picture even further, many researchers believe that there are two kinds of intelligence: fluid intelligence and crystallized intelligence. As we first noted in Chapter 9, **fluid intelligence** reflects information processing capabilities, reasoning, and memory. For instance, a person who is asked to arrange a series of letters according to some rule or to memorize a set of numbers uses fluid intelligence. In contrast, **crystallized intelligence** is the information, skills, and strategies that people have learned and accumulated through experience and that they can apply in problem-solving situations. Someone who is solving a crossword puzzle or attempting to identify the murderer in a mystery story is using crystallized intelligence, relying on his or her past experience as a resource.

fluid intelligence
reflects information processing capabilities, reasoning, and memory

crystallized intelligence
the accumulation of information, skills, and strategies that people have learned through experience and that they can apply in problem-solving situations

Initially, researchers believed that fluid intelligence was largely determined by genetic factors, and crystallized intelligence primarily by experiential, environmental factors. However, they later abandoned this distinction, largely because they found that crystallized intelligence is determined in part by fluid intelligence. For instance, a person's ability to solve a crossword puzzle (which involves crystallized intelligence) is a result of that person's proficiency with letters and patterns (a manifestation of fluid intelligence).

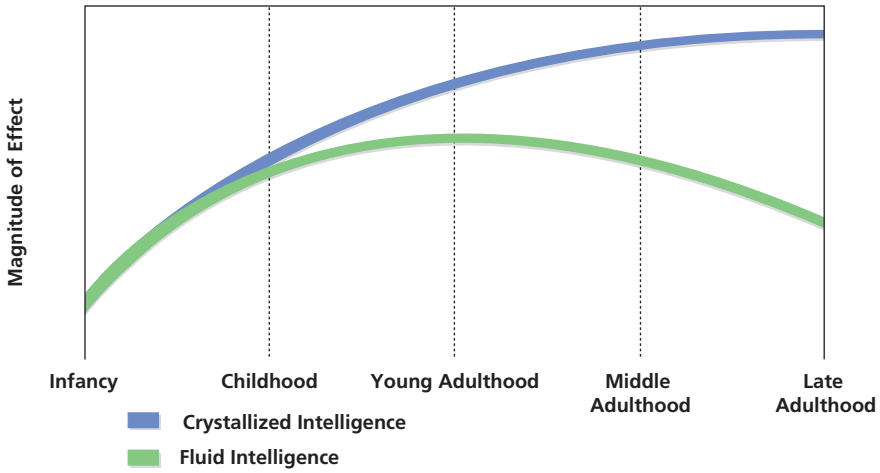
When developmentalists looked at the two kinds of intelligence separately, they arrived at a new answer to the question of whether intelligence declines with age. Actually, they arrived at two answers: yes and no. Yes, because in general, fluid intelligence does decline with age; no, because crystallized intelligence holds steady and in some cases actually improves (Salthouse, Pink, & Tucker-Drob, 2008; Ghisletta et al., 2012; Manard et al., 2015; see Figure 15-9).

If we look at more specific types of intelligence, true age-related differences and developments in intelligence begin to show up. According to developmental psychologist K. Warner Schaie (1994), who has conducted extensive longitudinal research on the course of adult intellectual development, we should consider many particular types of ability, such as spatial orientation, numeric ability, verbal ability, and so on, rather than the broad divisions of crystallized and fluid intelligence.

Figure 15-9 Changes in Crystallized and Fluid Intelligence

Although crystallized intelligence increases with age, fluid intelligence begins to decline in middle age. What are the implications for general competence in middle adulthood?

(**Source:** Schaie, 1985.)



When looked at in this way, the question of how intelligence changes in adulthood yields yet another answer, a more specific one. Schaie has found that certain abilities, such as inductive reasoning, spatial orientation, perceptual speed, and verbal memory, begin to decline very gradually at around age 25 and continue to decline through old age. Numeric and verbal abilities show a quite different pattern. Numeric ability tends to increase until the mid-forties, is lower at age 60, and then stays steady throughout the rest of life. Verbal ability rises until about the start of middle adulthood, around age 40, and stays fairly steady throughout the rest of the life span (Schaie, 1994).

Why do these changes occur? One reason is that brain functioning begins to change in middle adulthood. For example, researchers have found that 20 genes that are vital to learning, memory, and mental flexibility begin to function less efficiently as early as age 40. Furthermore, as people age, the specific areas of their brains used to accomplish particular tasks change. For instance, older adults use both brain hemispheres for tasks that in younger people involve just one hemisphere (Lu et al., 2004; Fling et al., 2011; Phillips, 2011).

From *an educator's* perspective

How do you think the apparent discrepancy between declining IQ scores and continuing cognitive competence in middle adulthood would affect the learning ability of middle adults who return to school?

REFRAMING THE ISSUE: WHAT IS THE SOURCE OF COMPETENCE DURING MIDDLE ADULTHOOD? Despite the gradual declines in particular cognitive abilities during middle adulthood, it is during this part of the life span that people come to hold some of the most important and powerful positions in society. How can we explain such continuing, and even growing, competence in the face of apparently ongoing declines in certain cognitive skills?

One answer comes from psychologist Timothy Salthouse (1994a), who suggests that there are four reasons why this discrepancy exists. For one thing, it is possible that typical measures of cognitive skills tap a different type of cognition than what is required to be successful in particular occupations. For example, traditional IQ tests fail to measure cognitive abilities that are related to occupational success. Perhaps we would find no

discrepancy between intelligence and cognitive abilities in middle adulthood if we used measures of practical intelligence rather than traditional IQ tests to assess intelligence.

A second factor also relates to the measurement of IQ and occupational success. It is possible that the most successful middle-aged adults are not representative of middle-aged adults in general. It may be that only a small proportion of people are highly successful, and the rest, who experience only moderate or little success, may have changed occupations, retired, or become sick and died. If we look at highly successful people, then, we are examining an unrepresentative sample of individuals.

It is also conceivable that the degree of cognitive ability required for professional success is simply not that high. According to this argument, people can be quite successful professionally and still be on the decline in certain kinds of cognitive abilities. In other words, their cognitive declines are not all that important; they have brains to spare.

Finally, it may be that older people are successful because they have developed specific kinds of expertise and particular competencies. Whereas IQ tests measure reactions to novel situations, occupational success may be influenced by very specific sorts of well-practiced abilities. Consequently, although their overall intellectual skills may show a decline, middle-aged individuals may maintain and even expand the distinctive talents they need for professional accomplishment. This explanation has generated a whole area of research on expertise, as we'll see later in the chapter.

selective optimization
the process by which people concentrate on particular skill areas to compensate for losses in other areas

For example, developmental psychologists Paul Baltes and Margaret Baltes have studied a strategy called selective optimization. **Selective optimization** is the process by which people concentrate on particular skill areas to compensate for losses in other areas. Baltes suggests that cognitive development during middle and later adulthood is a mixture of growth and decline. As people begin to lose certain abilities due to biological deterioration, they advance in other areas by strengthening their skills. Because they are able to compensate for their losses, they avoid showing any practical deterioration. Overall cognitive competence, then, ultimately remains stable and may even improve (Ebner, Freund, & Baltes, 2006; Deary, 2012; Hahn & Lachman, 2015).

Cognitive development during middle and later adulthood is a mixture of growth and decline. As people begin to lose certain abilities due to biological deterioration, they also advance in other areas by strengthening their skills.

For instance, recall that reaction time lengthens as people get older. Because reaction time is a component of typing skill, we would expect that older typists would be slower than younger ones. However, this is not the case. Why? The answer is that while their reaction time is increasing, older typists look further ahead in the material they are to type. This allows them to compensate for their lengthier reaction time. Similarly, although a business executive may be less quick in recalling names, he may have a mental file of deals he has completed in the past and be able to forge new agreements easily because of it.

Selective optimization is only one of the strategies adults with expertise in various fields use to maintain high performance. What are some other characteristics of experts?

The Development of Expertise: Separating Experts from Novices

LO 15.9 Explain the role of expertise in middle adulthood.

If you were ill and needed a diagnosis, would you prefer to visit a newly minted young physician who had just graduated from medical school or a more experienced, middle-aged physician?

If you chose the older physician, it's probably because you assumed that he or she would have a higher level of expertise. **Expertise** is the acquisition of skill or knowledge in a particular area. More focused than broader intelligence, expertise develops as people devote attention and practice to particular domains and, in so doing, gain experience, either because of their profession or because they simply enjoy a given area. For example, physicians become better at diagnosing the symptoms of a medical problem in their patients as they gain experience. Similarly, a person who enjoys cooking and does a lot

expertise
the acquisition of skill or knowledge in a particular area

of it begins to know beforehand how a recipe will taste if certain modifications are made (Morita et al., 2008; Reuter et al., 2012; Reuter et al., 2014).

What separates experts from those who are less skilled in a given area? While beginners use formal procedures and rules, often following them very strictly, experts rely on experience and intuition, and they often bend the rules. Because experts have so much experience, their processing of information is often automatic, performed without the need for much thought. Experts often are not very articulate at explaining how they draw conclusions; their solutions often just seem right to them—and *are* more likely to be right. Brain imaging studies show that experts, compared to novices, use different neural pathways to solve problems (Grabner, Neubauer, & Stern, 2006).

Finally, when difficulties arise, experts develop better strategies for solving them than nonexperts, and they're more flexible in approaching problems. Their experience has provided them with alternative routes to the same problem, and this increases the probability of success (Willis, 1996; Clark, 1998; Arts, Gijselaers, & Boshuizen, 2006).

Of course, not everyone develops expertise in some particular area during middle adulthood. Professional responsibilities, amount of leisure time, educational level, income, and marital status all affect the development of expertise.

Memory: You Must Remember This

LO 15.10 Describe how aging affects memory and how memory can be improved.

Whenever Mary Donovan can't find her car keys, she mutters to herself that she is "losing her memory." Like Bina Clingman, who was worried about forgetting things like letters and phone numbers, Mary probably believes that memory loss is pretty common in middle age.

However, if she fits the pattern of most people in middle adulthood, her assessment is not necessarily accurate. According to research on memory changes in adulthood, most people show only minimal memory losses, and many exhibit none at all, during middle adulthood. Furthermore, because of societal stereotypes about aging, people in middle adulthood may be prone to attribute their absentmindedness to aging, even though they have been absentminded throughout their lives. Consequently, it is the *meaning* they give to their forgetfulness that changes rather than their actual ability to remember (Chasteen et al., 2005; Hoessler & Chasteen, 2008; Hess, Hinson, & Hodges, 2009).

TYPES OF MEMORY. To understand the nature of memory changes, it is necessary to consider the different types of memory. Memory is traditionally viewed in terms of three sequential components: sensory memory, short-term memory (also called working memory), and long-term memory. *Sensory memory* is an initial, momentary storage of information that lasts only an instant. Information is recorded by an individual's sensory system as a raw, meaningless stimulus. Next, information moves into *short-term memory*, which holds it for 15 to 25 seconds. Finally, if the information is rehearsed, it is moved into *long-term memory*, where it is stored on a relatively permanent basis.

Both sensory memory and short-term memory show virtually no weakening during middle adulthood. The story is a bit different for long-term memory, which declines with age for some people. It appears, however, that the reason for the decline is not a fading or a complete loss of memory, but rather that with age, people register and store information less efficiently. In addition, age makes people less efficient in retrieving information that is stored in memory. In other words, even if the information was adequately stored in long-term memory, it may become more difficult to locate or isolate it (Salthouse, 1994b).

It is important to keep in mind that memory declines in middle age are relatively minor, and most can be compensated for by various cognitive strategies. As mentioned earlier, paying greater attention to material when it is first encountered can aid in its later

recall. Your lost car keys may have relatively little to do with memory declines, instead reflecting your inattentiveness when you put them down.

Many middle-aged adults find it hard to pay attention to particular things for some of the same reasons expertise develops. They are used to using memory shortcuts, *schemas,* to ease the burden of remembering all the many things that each of us experiences every day.

MEMORY SCHEMAS. One of the ways that people recall information is through the use of **schemas**, organized bodies of information stored in memory. Schemas help people represent the way the world is organized and allow them to categorize and interpret new information (Fiske & Taylor, 1991). For example, we may have a schema for eating out in a restaurant. We don't need to treat a meal in a new restaurant as a completely new experience. We know that when we go there, we will be seated at a table or counter and offered a menu from which to select food. Our schema for eating out tells us how to relate to the server, what sorts of food to eat first, and that we should leave a tip at the end of the meal.

schemas
organized bodies of information stored in memory

People hold schemas for particular individuals (such as the particular behavior patterns of one's mother, wife, or child) as well as for categories of people (mail carriers, lawyers, or professors) and behaviors or events (dining in a restaurant or visiting the dentist). People's schemas serve to organize their behavior into coherent wholes and help them to interpret social events. For example, a person who knows the schema for a visit to the doctor is not likely to be surprised when he is asked to remove his clothes.

Schemas also convey cultural information. Psychologists Susan Fiske and Shelley Taylor (1991) give an example of an old Native American folktale in which the hero participates with several companions in a battle and is shot by an arrow. However, he feels no pain from the arrow. When he returns to his home and tells the story, something black emerges from his mouth, and he dies the next morning.

This tale is puzzling to most Westerners because they are unschooled in the particular Native American culture to which the story belongs. However, to someone familiar with the Native American culture, the story makes perfect sense: The hero feels no pain because his companions are ghosts, and the "black thing" coming from his mouth is his departing soul.

For a Native American, it may be relatively easy to later recall the story, because it makes sense in a way that it doesn't to members of other cultures. Furthermore, material that is consistent with existing schemas is more likely to be recalled than material that is inconsistent (Van Manen & Pietromonaco, 1993). For example, a person who usually puts her keys in a certain spot may lose them because she doesn't recall putting them down somewhere other than in the usual place. (Also see *Are You an Informed Consumer of Development*?)

mnemonics
formal strategies for organizing material in ways that make it more likely to be remembered

Are You an Informed Consumer of Development?

Effective Strategies for Remembering

All of us are forgetful at one time or another. However, there are techniques that can help us remember more effectively and make it less likely that we will forget things that we wish to remember. **Mnemonics** (pronounced "nee-MON-iks") are formal strategies for organizing material in ways that make it more likely to be remembered. Among the mnemonics that work not only in middle adulthood but also at other points of the life span are the following (Bellezza, Six, & Phillips, 1992; Guttman, 1997; Bloom & Lamkin, 2006; Morris & Fritz, 2006):

- *Get organized.* For people who have trouble keeping track of where they left their keys or remembering appointments, the simplest approach is for them to become more

organized. Using an appointment book, hanging one's keys on a hook, or using Post-It notes can help jog one's memory.

- *Pay attention.* You can improve your recall by initially paying attention when you are exposed to new information and by purposefully thinking that you wish to recall it in the future. If you are particularly concerned about remembering something, such as where you parked your car, pay particular attention at the moment you park the car, and remind yourself that you really want to remember.
- *Use the encoding specificity phenomenon.* According to the encoding specificity phenomenon, people are most likely to recall information in environments that are similar to those in which they initially learned ("encoded") it (Tulving & Thompson, 1973). For instance, people are best able to recall information on a test if the test is held in the room in which they studied.
- *Visualize.* Making mental images of ideas can help you recall them later. For example, if you want to remember that global warming may lead to rising oceans, think of yourself on a beach on a hot day, with the waves coming closer and closer to where you've set out your beach blanket.
- *Rehearse.* In the realm of memory, practice makes perfect, or if not perfect, at least better. Adults of all ages can improve their memories if they expend more effort in rehearsing what they want to remember. By practicing what they wish to recall, people can substantially improve their recall of the material.

Module 15.3 Review

- The question of whether intelligence declines in middle adulthood is complicated by limitations in cross-sectional studies and longitudinal studies. Intelligence appears to be divided into components, some of which decline while others hold steady or even improve. In general, cognitive competence in middle adulthood holds fairly steady despite declines in some areas of intellectual functioning.
- Expertise, the application of skill or knowledge in practical areas of life, increases in middle adulthood because of gains in experience. Experts rely less on formal procedures and more on intuition, and they are better at problem solving than non-experts.
- Memory may appear to decline in middle age, but in fact long-term memory deficits are probably due to ineffective strategies of storage and retrieval. Memory strategies have been shown to be effective in improving memorization and recall of information.

Journal Writing Prompt

Applying Lifespan Development: How might crystallized and fluid intelligence work together to help middle-aged people deal with novel situations and problems?

Epilogue

People's physical abilities and health in middle adulthood are generally still good. Subtle changes are occurring, but individuals often find it easy to compensate for them because of the strengths of other cognitive skills. The incidence of chronic and life-threatening diseases increases, especially heart disease and cancer. In the cognitive realm, intelligence and memory decline very gradually in some areas, but this decline is hidden by compensatory strategies and gains in other areas.

Return to the prologue of this chapter, about Kara Miles who does not intend to grow old gracefully, and answer these questions.

1. From the evidence in the story, would you say Kara's Type A personality puts her at risk for heart disease? Explain your thinking.
2. What do you think are the healthy aspects of Kara's lifestyle? What about her attitudes toward aging?
3. Kara jokes that she and her companion Stephan have "just enough sex to keep everything working." What challenges does sexual intercourse pose to a couple in their fifties? What mental and physical health benefits does it provide?
4. Cognitively, what advantages does Kara's experience give her over younger competitors? What advantages might younger architects have over her?

Looking Back

LO 15.1 Describe the physical changes that affect people in middle adulthood.

During middle adulthood, roughly the period from 40 to 65, people typically decline slowly in height and strength, and gain in weight. Height loss, especially in women, may be associated with osteoporosis, a thinning of the bones brought about by a lack of calcium in the diet. The best antidote for physical and psychological deterioration appears to be a healthful lifestyle, including regular exercise.

LO 15.2 Explain how the senses change in middle adulthood.

Visual acuity declines during this period as the eyes' lens changes. People in middle adulthood tend to experience declines in near vision, depth and distance perception, adaptation to darkness, and the ability to perceive in three dimensions. In addition, the incidence of glaucoma, a disease that can cause blindness, increases in middle adulthood. Hearing acuity also declines slightly in this period, typically involving some loss of the ability to hear high-frequency sounds and a deterioration of sound localization.

LO 15.3 Explain how reaction time changes during middle adulthood.

Reaction time of middle-aged people begins to increase gradually, but slower reactions are largely offset in complex tasks by increased skill due to years of task rehearsal.

LO 15.4 Compare how middle-aged men and middle-aged women experience changes in sexuality.

Adults in middle age experience changes in sexuality, but these are less dramatic than commonly supposed, and many middle-aged couples experience new sexual freedom and enjoyment. Women in middle age experience the female climacteric, the change from being able to bear children to no longer being able to do so. The most notable sign is menopause, which is often accompanied by physical and emotional discomfort. Therapies and changing attitudes toward menopause appear to be lessening women's fears and experience of difficulty regarding menopause. Men also undergo changes in their reproductive systems, sometimes referred to as the male climacteric. Generally, the production of sperm and testosterone declines and the prostate gland enlarges, causing difficulties with urination.

LO 15.5 Describe changes in health that occur in middle adulthood.

Middle adulthood is generally a healthy period, but people become more susceptible to chronic diseases, including arthritis, type 2 diabetes, and hypertension, and they have a higher death rate than before. However, the death rate among people in middle adulthood in the United States has been steadily declining. Overall health in middle adulthood varies according to socioeconomic status and gender. People of higher SES are healthier and have lower death rates than people of lower SES. Women have a lower mortality rate than men but a higher incidence of illness. Researchers have generally paid more attention to the life-threatening diseases experienced by men than to the less fatal but chronic diseases typical of women.

LO 15.6 Describe the risk factors related to coronary heart disease.

Heart disease begins to be a significant factor in middle adulthood. Genetic characteristics, such as age, gender, and a family history of heart disease, are associated with the risk of heart disease, as are environmental and behavioral factors, including smoking, a diet high in fats and cholesterol, and a lack of exercise. Psychological factors also play a role in heart disease. A pattern of behaviors associated with competitiveness, impatience, frustration, and particularly hostility—called the Type A behavior pattern—is associated with a high risk of heart problems.

LO 15.7 Summarize what causes cancer and what tools are available to diagnose and treat it.

Like heart disease, cancer becomes a threat in middle adulthood and is related to genetic and environmental factors. Treatments include radiation therapy, chemotherapy, and surgery. Psychological factors may play a role in cancer, although the research is mixed. Furthermore, persons with strong family and social ties appear to be less likely to develop cancer than persons who lack such ties. Breast cancer is a significant risk for women in middle adulthood. Mammography can help identify cancerous tumors early enough for successful treatment, but the age at which women should begin to have routine mammograms—40 or 50—is a matter of controversy.

LO 15.8 Describe what happens to a person's intelligence in middle adulthood.

The question of whether intelligence declines in middle adulthood is challenging to answer because the two basic methods of addressing it have significant limitations. Cross-sectional methods, which study many subjects of different ages at one point in time, suffer from cohort effects. Longitudinal studies, which focus on the same subjects at several different points in time, are plagued by the difficulty of keeping a sample of subjects intact over many years. Those who divide intelligence into two main

types—fluid and crystallized—generally find that fluid intelligence slowly declines through middle adulthood while crystallized intelligence holds steady or improves. Those who divide intelligence into greater numbers of components find an even more complicated pattern. People in middle adulthood generally display a high degree of overall cognitive competence despite demonstrated declines in particular areas of intellectual functioning. People tend to focus on and exercise specific areas of competence that generally compensate for areas of loss, a strategy known as selective optimization.

LO 15.9 Explain the role of expertise in middle adulthood.

Experts maintain, and even increase, cognitive competence in a particular subject through attention and practice. Experts process information about their field significantly differently from novices.

LO 15.10 Describe how aging affects memory and how memory can be improved.

Memory in middle adulthood may seem to be on the decline, but the problem is not with either sensory memory or short-term memory. Even apparent problems with long-term memory may have more to do with people's storage and retrieval strategies rather than with overall memory deterioration, and the problems are minor and relatively easy to overcome. People interpret, store, and recall information in the form of memory schemas, which organize related bits of information, set up expectations, and add meaning to phenomena. Mnemonic devices can help people improve their ability to recall information by forcing them to pay attention to information as they store it (the keyword technique), to use cues to enable retrieval (the encoding specificity phenomenon), or to practice information retrieval (rehearsal).

Key Terms and Concepts

Chapter 16

Social and Personality Development in Middle Adulthood

Learning Objectives

LO 16.1 Describe ways in which personality develops during middle adulthood.

LO 16.2 Summarize Erikson's view of development during middle adulthood and how others have expanded on his ideas.

LO 16.3 Discuss the nature of continuity in personality development during middle adulthood.

LO 16.4 Describe typical patterns of marriage and divorce in middle adulthood.

LO 16.5 Differentiate the changing family situations middle-aged adults face.

LO 16.6 Describe how people in middle adulthood react to becoming grandparents.

LO 16.7 List the causes and characteristics of family violence in the United States.

LO 16.8 Summarize characteristics of work and career in middle adulthood.

LO 16.9 Describe the effect losing one's job has on a person in middle adulthood.

LO 16.10 Explain how and why people change careers in middle adulthood.

LO 16.11 Describe how people experience leisure time in middle adulthood.

Chapter Overview

Prologue: All in the Family

Geoff Kelvin lives with his spouse Juan, their adopted six-year-old son Paul, and Geoff's dad. When asked how midlife is treating him, Geoff, 48, laughs. "I'm in the middle, all right," he says. "The middle of a big, noisy, rich life I could not have imagined at 20." Geoff teaches fifth grade and loves it. "Working with kids, being a parent, it keeps you on your toes." Adopting Paul has also opened up his personality. "Growing up gay, I kept a bit of distance around me," he admits. "But having a kid puts you smack in the center of a social scene where everyone shares this big job called parenting. Now, I swap stories and share concerns with the other moms and dads."

Two years ago, Geoff's dad suffered a stroke that left him partly paralyzed. "We never got along that well. He wasn't too keen on his only son being gay," Geoff says. "But I said, 'You have to move in. There's no place else to go.'" The first months were bumpy, but then Juan quit his job at a drug research company—he was sick of office politics—to stay home and write articles about environmental issues. The decision worked out well. "Juan was happier, and he had the patience to deal with my dad," Geoff says. "In fact, he changed my dad's views about gays and gay marriage. Now, we all get along, and my dad loves to joke that he lives in a 'real man cave.'" ■

Looking Ahead

The complex and changing patterns of Geoff and Juan's family life are not unusual: Few lives follow a set, predictable pattern through middle adulthood. In fact, one of the remarkable characteristics of middle age is its variety, as the paths that different people travel continue to diverge.

In this chapter, we focus on the personality and social development that occurs in midlife. We begin by examining the personality changes that typify this period. We also explore some of the controversies that underlie developmental psychologists' understandings of midlife, including whether the midlife crisis, a phenomenon popularized in modern media, is fact or fiction.

During middle age, adults' relationships with others continue to evolve.

Next we consider the relationships that evolve during middle adulthood, the various familial ties that bind people together (or come unglued) during this period, including marriage, divorce, the empty nest, and grandparenting. We also look at a bleaker side of family relations: family violence, which is surprisingly prevalent.

Finally, the chapter examines the role of work and leisure during middle adulthood. We will examine the changing role of work in people's lives and some of the difficulties associated with work, such as burnout and unemployment. The chapter concludes with a discussion of leisure time, which becomes more important during middle age.

Personality Development

My 40th birthday was not an easy one. It's not that I woke up one morning and felt different—that's never been the case. But what did happen during my fortieth year was that I came to the realization of the finiteness of life, and that the die was cast. I began to understand that I probably wasn't going to be president of the United States—a secret ambition—or a CEO of a major corporation. Time was no longer on my side, but something of an adversary. But it was curious: Rather than following my traditional pattern of focusing on the future, planning to do this or do that, I began to appreciate what I had. I looked around at my life, was pretty well satisfied with some of my accomplishments, and began to focus on the things that were going right, not the things that I was lacking. But this state of mind didn't happen in a day; it took several years after turning 40 before I felt this way. Even now, it is hard to fully accept that I am middle-aged.

As this 47-year-old man suggests, the realization that one has entered middle adulthood does not always come easily, nor is it generally welcome. In many Western societies, the age of 40 has special meaning, bringing with it the inescapable fact that one is now middle-aged—at least in the view of others—and the suggestion, embodied in everyday common wisdom, that one is about to experience the throes of a "midlife crisis." Is this view correct? As we'll see, it depends on your perspective.

In Western society, turning 40 represents an important milestone.

Two Perspectives on Adult Personality Development: Normative Crisis versus Life Events

LO 16.1 Describe ways in which personality develops during middle adulthood.

Traditional views of personality development during adulthood have suggested that people move through a fixed series of stages, each tied fairly closely to age. These stages are related to specific crises in which an individual goes through an intense period of questioning and even psychological turmoil. This traditional perspective is a feature of what are called normative-crisis models of personality development. **Normative-crisis models** see personality development in terms of fairly universal stages, tied to a sequence of age-related crises. For example, Erik Erikson's psychosocial theory predicts that people move through a series of stages and crises throughout the life span.

In contrast, some critics suggest that normative-crisis approaches may be outmoded. They arose at a time when society had fairly rigid and uniform roles for people. Traditionally, men were expected to work and support a family; women were expected to stay at home, be housewives, and take care of the children. And the roles of men and women played out at relatively uniform ages.

Today, however, there is considerable variety in both the roles and the timing. Some people marry and have children at 40. Others have children and marry later. Still others never marry, but live with a partner of the same or opposite sex and perhaps adopt a child or forego children altogether. In sum, changes in society have called into question normative-crisis models that are tied closely to age (Fugate & Mitchell, 1997; Barnett & Hyde, 2001; Fraenkel, 2003).

normative-crisis models
the approach to personality development that is based on fairly universal stages tied to a sequence of age-related crises

From *a social worker's* perspective

In what ways might normative-crisis models of personality development be specific to Western culture?

life events models
the approach to personality development that is based on the timing of particular events in an adult's life rather than on age per se

Because of all this variation, some theorists, such as Ravenna Helson, focus on what may be called **life events models**, which suggest that it is the particular events in an adult's life, rather than age per se, that determines the course of personality development. For instance, a woman who has her first child at age 21 may experience psychological forces similar to those experienced by a woman who has her first child at age 39. The result is that the two women, despite their very different ages, share certain commonalities of personality development (Helson & Wink, 1992; Helson & Srivastava, 2001; Roberts, Helson, & Klohnen, 2002).

It is not clear whether the normative-crisis view or the life events perspective will ultimately paint the more accurate picture of personality development and change during the course of adulthood. What is clear is that developmental theorists from a range of perspectives all agree that middle adulthood is a time of continuing—and significant—psychological growth.

Erikson's Stage of Generativity versus Stagnation

LO 16.2 Summarize Erikson's view of development during middle adulthood and how others have expanded on his ideas.

generativity-versus-stagnation stage
according to Erikson, the stage during middle adulthood in which people consider their contributions to family and society

As we first discussed in Chapter 12, psychoanalyst Erik Erikson suggested that middle adulthood encompasses a period he characterized as the **generativity-versus-stagnation stage**. One's middle adulthood, according to Erikson, is spent either in what he called generativity, making a personal contribution to family, community, work, and society as a whole, or in stagnation. Generative people strive to play a role in guiding and encouraging future generations. Often, people find generativity through parenting, but other roles can fill this need too. People may work directly with younger individuals, acting as mentors, or they may satisfy their need for generativity through creative and artistic output, seeking to leave a lasting contribution. The focus of those who experience generativity, then, is beyond themselves, as they look toward the continuation of their own lives through others (Clark & Arnold, 2008; Penningroth & Scott, 2012; Schoklitsch & Baumann, 2012).

On the other hand, a lack of psychological growth in this period means that people become stagnant. Focusing on the triviality of their own activity, people may come to feel that they have made only limited contributions to the world, that their presence has counted for little. Some individuals find themselves floundering, still seeking new and potentially more fulfilling careers. Others become frustrated and bored.

Although Erikson provides a broad overview of personality development, some psychologists have suggested that we need a more precise look at changes in personality during middle adulthood. We'll consider three alternative approaches.

BUILDING ON ERIKSON'S VIEWS: VAILLANT AND GOULD. Developmentalist George Vaillant (1977) argues that an important period between about ages 45 and 55 is "keeping the meaning" versus rigidity. During that period, adults seek to extract the meaning from their lives, and to "keep the meaning," by developing an acceptance of the strengths and weaknesses of others. Although they recognize that the world is not perfect and has many shortcomings, they strive to safeguard their world, and they are relatively content. The man quoted at the beginning of this section, for example, seems to be content with the meaning he has found in his life. People who are not able to keep the meaning in their lives risk becoming rigid and increasingly isolated from others.

Psychiatrist Roger Gould (1978, 1980) offered an alternative to both Erikson's and Vaillant's views. While he agrees that people move through a series of stages and potential crises, he suggests that adults pass through a series of seven stages associated with specific age periods (see Table 16-1). According to Gould, people in their late 30s and early 40s begin to feel a sense of urgency in terms of attaining life's goals as they realize that their time is limited. Coming to grips with the reality that life is finite can propel people toward adult maturity.

Gould based his model of adult development on a relatively small sample and relied heavily on his own clinical judgments. Little research has supported his description of the various stages, which was heavily influenced by the psychoanalytic perspective.

Table 16-1 Summary of Gould's Transformations in Adult Development

Stage	Approximate Age Range	*At this stage, people typically:*
1	16 to 18	plan to leave home and terminate parental control
2	18 to 22	leave the family and begin to reorient toward peers
3	22 to 28	become independent and commit to career and (often) spouse and children
4	29 to 34	question themselves and experience confusion; they may become dissatisfied with marriage and career
5	35 to 43	feel an urgent need to achieve life goals, becoming increasingly aware of the passage and limits of time; they often realign life goals
6	43 to 53	settle down at last, with acceptance of their lives
7	53 to 60	grow more tolerant, accepting their past; they become less negative and generally more mellow

(**Source:** Based on *Transformations*, by R. L. Gould, 1978, New York: Simon & Schuster.)

BUILDING ON ERIKSON'S VIEWS: LEVINSON'S SEASON OF LIFE THEORY. Another alternative to Erikson's work is psychologist Daniel Levinson's *seasons of life* theory. According to Levinson (1986, 1992), who intensively interviewed a group of men, the early 40s are a period of transition and crisis. Levinson suggests that adult men pass through a series of stages beginning with their entry into early adulthood at around age 20 and continuing into middle adulthood. The beginning stages have to do with leaving one's family and entering the adult world.

At around age 40 or 45, however, people move into a period that Levinson calls the midlife transition. The *midlife transition* is a time of questioning. People begin to focus on the finite nature of life, and they begin to question some of their everyday, fundamental assumptions. They experience the first signs of aging, and they confront the knowledge that they will be unable to accomplish all their aims before they die.

In Levinson's view, this period of assessment may lead to a **midlife crisis**, a stage of uncertainty and indecision brought about by the realization that life is finite. Facing signs of physical aging, men may also discover that even the accomplishments of which they are proudest have brought them less satisfaction than they expected. Looking toward the past, they may seek to define what went wrong and look for ways to correct their past mistakes. The midlife crisis, then, is a painful and tumultuous period of questioning.

midlife crisis
a stage of uncertainty and indecision brought about by the realization that life is finite

Levinson's view is that most people are susceptible to a fairly profound midlife crisis. But before accepting his perspective, we need to consider some critical drawbacks in his research. First, his initial theorizing was based on a group of only 40 men, and his work with women was carried out years later and once again on only a small sample. Furthermore, Levinson overstated the consistency and generality of the patterns he found in the samples he used to derive his theory. In fact, as we consider next, the notion of a universal midlife crisis has come under considerable criticism (Stewart & Ostrove, 1998; McFadden & Swan, 2012; Thorpe et al., 2014).

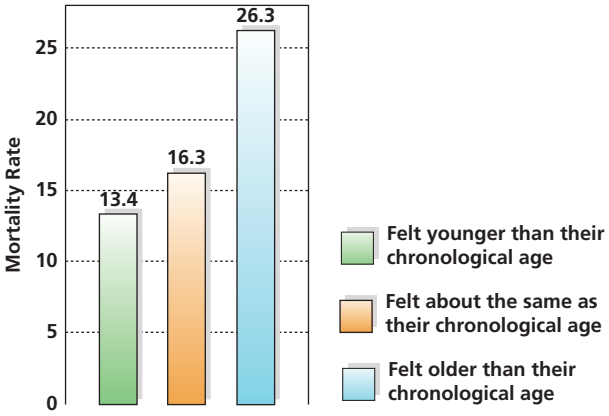
THE MIDLIFE CRISIS: REALITY OR MYTH? Central to Levinson's model of the seasons of life is the concept of *midlife crisis*, a period in the early 40s presumed to be marked by intense psychological turmoil. The notion has taken on a life of its own: There is a general expectation in U.S. society that the age of 40 represents an important psychological juncture.

There's a problem, though, with such a view: The evidence for a widespread midlife crisis is simply lacking. Rather, most research suggests that, for most people, the passage into middle age is relatively tranquil. The majority of people regard midlife as a particularly rewarding time. If they are parents, for example, their children often have passed the period when childrearing is physically demanding, and in some cases children have left the home altogether, allowing parents the opportunity to rekindle an intimacy that they may have lost. Many middle-aged people find that their careers have blossomed—as we discuss later in this chapter—and far from being in crisis, they may feel quite content with their lot in

Figure 16-1 Feeling Younger and Age of Death

People who said they felt younger than their chronological age were more likely to live longer than those who felt older than their chronological death.

(**Source:** Based on Rippon, Isla, & Steptoe, A. (2015). Feeling Old vs Being Old: Associations between Self-perceived Age and Mortality JAMA Intern Med. 2015; 175(2):307-309. doi:10.1001/jamainternmed.2014.6580.)



life. Rather than looking toward the future, they focus on the present, seeking to maximize their ongoing involvement with family, friends, and other social groups. Those who feel regret over the course of their lives may be motivated to change the direction of their lives, and those who do change their lives end up better off psychologically (Stewart & Vandewater, 1999).

Furthermore, how one feels about one's age is actually associated with health outcomes. People who feel younger than their chronological age are more likely to avoid death than those who feel older than their chronological age. In other words, the younger people felt, the less likely they were to die within an eight-year period following being asked the question of how old they felt (see Figure 16-1; Miche et al., 2014; Rippon & Steptoe, 2015).

In short, the evidence for a midlife crisis experienced by most people is no more compelling than the evidence for a stormy adolescence. Yet, like that notion, the idea that the midlife crisis is nearly universal seems unusually well entrenched in "common wisdom." Why is this the case?

One reason may be that people who do experience turmoil during middle age tend to be relatively obvious and easily remembered by observers. For instance, a 40-year-old man who divorces his wife, replaces his sedate Volvo station wagon with a red Audi convertible, and marries a much younger woman is likely to be more conspicuous than a happily married man who remains with his spouse (and Chevrolet) throughout middle adulthood. As a consequence, we are more likely to notice and recall marital difficulties than the lack of them. In this way the myth of a blustery and universal midlife crisis is perpetuated. The reality, though, is quite different: For most people, a midlife crisis is more the stuff of fiction than of reality. For some people midlife may not bring many changes at all. And as we consider in the *Developmental Diversity and Your Life* box in some cultures, middle age is not even considered a separate period of life.

Stability versus Change in Personality

LO 16.3 Discuss the nature of continuity in personality development during middle adulthood

Jane Hennesey, age 53 and a vice president of an investment banking firm, says that inside, she still feels like a kid.

Many middle-aged adults would agree with such a sentiment. Although most people tend to say that they have changed a good deal since they reached adolescence—and mostly for the better—many also contend that in terms of basic personality traits, they perceive important similarities between their present selves and their younger selves.

The degree to which personality is stable across the life span or changes as we age is one of the major issues of personality development during middle adulthood. Theorists such as Erikson and Levinson clearly suggest that there is substantial change over time. Erikson's stages and Levinson's seasons describe set patterns of change. The change may be predictable and related to age, but it is substantial.

Conversely, an impressive body of research suggests that at least in terms of individual traits, personality is quite stable and continuous over the life span. Developmental psychologists Paul Costa and Robert McCrae find remarkable stability in particular traits. Even-tempered 20-olds are even-tempered at age 75; affectionate 25-year-olds become affectionate 50-year-olds; and disorganized 26-year-olds are still disorganized at age 60. Similarly, self-concept at age 30 is a good indication of self-concept at age 80 (Terracciano, McCrae, & Costa, 2009; Mõttus, Johnson, & Deary, 2012; Debast et al., 2014; also see Figure 16-2).

Developmental Diversity and Your Life

Middle Age: In Some Cultures It Doesn't Exist

There's no such thing as middle age.

At least one can draw that conclusion by looking at the lives of women living in the Oriya culture in Orissa, India. According to research carried out by developmental anthropologist Richard Shweder, who studied how high-caste Hindu women viewed the process of aging, a distinct period of middle age does not exist. These women view their life course not on the basis of chronological age, but on the nature of one's social responsibility, family management issues, and moral sense at a given time (Shweder, 1998, 2003).

Some women living in the Oriya culture in Orissa, India, view their life course not on the basis of chronological age but on the nature of one's social responsibility, family management issues, and moral sense at a given period.

The model of aging of the Oriyan woman is based on two phases of life: life in her father's house (*bapa gharo*), followed by life in her husband's mother's house (*sasu gharo*). These two segments make sense in the context of Oriyan family life, which consists of multigenerational households in which marriages are arranged. After they are married, husbands remain with their parents, and wives are expected to move into the husband's parents' household. At the time of marriage, a wife's social status is seen as having changed from a child (someone's daughter) to a sexually active female (a daughter-in-law).

The shift from child to daughter-in-law typically occurs around the age of 18 to 20. However, chronological age per se does not mark significant boundaries in life for Oriyan women, nor do physical changes, such as the onset of menstruation and its cessation at menopause. Instead, it is the change from daughter to daughter-in-law that brings about a significant alteration in social responsibility. For instance, women must shift their focus from their own parents to the parents of their husband, and they must become sexually active in order to reproduce the husband's family line.

To a Western eye, the description of the life course of these Indian women suggests that they might perceive their lives as restricted because in most cases they have no careers outside the home, but they do not see themselves in this light. In fact, in the Oriya culture, domestic work is highly respected and valued. Furthermore, Oriyan women perceive themselves as more cultured and civilized than men, who must work outside the home.

In short, the notion of a separate middle age is clearly a cultural construction. The significance of a particular age range differs significantly depending on the culture in which one lives.

There is also evidence that people's traits actually become more ingrained as they age. For instance, some research suggests that confident adolescents become more confident in their mid-50s, while shy people become more diffident over the same time frame.

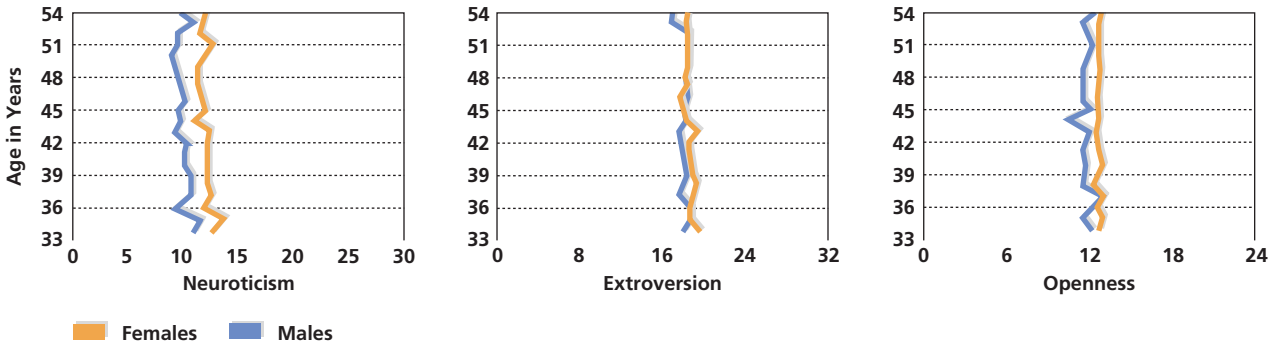
STABILITY AND CHANGE IN THE "BIG FIVE" PERSONALITY TRAITS. Quite a bit of research has centered on the personality traits that have come to be known as the "Big Five"—because they represent the five major clusters of personality characteristics. These include the following:

- ***Neuroticism,*** the degree to which a person is moody, anxious, and self-critical
- ***Extroversion,*** how outgoing or shy a person is

Figure 16-2 The Stability of Personality

According to Paul Costa and Robert McCrae, basic personality traits such as neuroticism, extroversion, and openness are stable and consistent throughout adulthood.

(**Source:** Based on Costa et al., 1986, p. 148.)



- ***Openness,*** a person's level of curiosity and interest in new experiences
- ***Agreeableness,*** how easygoing and helpful a person tends to be
- ***Conscientiousness,*** a person's tendencies to be organized and responsible

The majority of studies find that the Big Five traits are relatively stable past the age of 30, although there are some variations in specific traits. In particular, neuroticism, extraversion, and openness to experience decline somewhat from early adulthood through middle adulthood, while agreeableness and conscientiousness increase to a degree—findings that are consistent across cultures. The basic pattern, however, is one of stability in these basic traits through adulthood (Srivastava et al., 2003; Hahn, Gottschling, & Spinath, 2012; Curtis, Windsor, & Soubelet, 2015).

WATCH THIS VIDEO ON MYPSYCHLAB MIDDLE ADULTHOOD: HAPPINESS: HUANG YU

Does evidence for the stability of personality traits contradict the perspective of personality change championed by theorists such as Erikson, Gould, and Levinson? Not necessarily, for on closer inspection the contradictions of the two approaches may be more apparent than real.

On one hand, people's basic traits do appear to show continuity, particularly over the course of their adult lives. On the other hand, people are also susceptible to changes in their lives, and adulthood is jam-packed with major events, such as changes in family status, career, and even the economy. Furthermore, physical changes due to aging, illness, the death of a loved one, and an increased understanding of a finite life span can provide the impetus for changes in the ways people view themselves and the world at large (Roberts, Walton, & Viechtbauer, 2006; Iveniuk et al., 2014).

Module 16.1 Review

- Normative-crisis models portray people as passing through age-related stages of development; life events models focus on specific changes in response to varying life events.
- According to Erikson, middle adulthood encompasses the generativity-versus-stagnation stage, while Vaillant sees it as the "keeping the meaning versus rigidity" period. Gould suggests that people move through seven stages during adulthood. Levinson argues that the midlife transition can lead to a midlife crisis, but there is little evidence for this in the majority of middle-aged people.
- Broad, basic personality characteristics are relatively stable. Specific aspects of personality do seem to change in response to life events.

Journal Writing Prompt

Applying Lifespan Development: Does the concept of "middle age" exist in your culture? If not, how are life stages of adults perceived in your culture? If the concept does exist, does the concept of mid-life crisis exist as well?

Relationships: Family in Middle Age

For Kathy and Bob, accompanying their son Jon to his college orientation was like nothing they had ever experienced before. When Jon had been accepted at a college on the other side of the country, the reality that he would be leaving home didn't really register. It wasn't until the time came to leave him on his new campus that the sense that their family would be changing in ways they could barely fathom hit them. It was a wrenching experience. Not only did Kathy and Bob worry about their son as parents tend to do, but they felt a sense of profound loss—that, to a large extent, their job of raising their son was over. Now he was on his own. It was a thought that filled them with pride but with great sadness as well.

For members of many non-Western cultures who live in traditional extended families in which multiple generations spend their lives in the same household or village, middle adulthood is not particularly special. But in Western cultures, family dynamics undergo significant change during middle adulthood. It is in middle age that most parents experience major changes in their relationships not only with their children but with other family members as well. It is a period of shifting role relationships that, in twenty-first-century Western cultures, encompasses an increasing number of combinations and permutations. We'll start by looking at the ways in which marriage develops and changes over this period and then consider some of the many alternative forms that family life takes today (Kaslow, 2001).

Marriage and Divorce

LO 16.4 Describe typical patterns of marriage and divorce in middle adulthood.

Two of the largest transitions that can occur during middle adulthood are marriage and divorce. Let's consider how they unfold.

MARRIAGE. Fifty years ago, midlife was similar for most people. Men and women who had married during early adulthood were still married to one another. One hundred years ago, when life expectancy was much shorter than it is today, people in their 40s were most likely married—but necessarily not to the same persons they had first married. Spouses often died; people might be well into their second marriage by the time of middle age.

Today the story is different and, as we said earlier, more varied. More people are single during middle adulthood, having never married. Single people may live alone or with a partner. Gay and lesbian adults, for example, may have committed relationships and now have the legal right to marry. Among heterosexuals, some have divorced, lived alone, and then remarried. During middle adulthood, many people's marriages end in divorce, and many families "blend" together into new households, containing children and stepchildren from previous marriages. Other couples still spend between 40 and 50 years together, the bulk of those years during middle adulthood. Many people experience the peak of marital satisfaction during middle age.

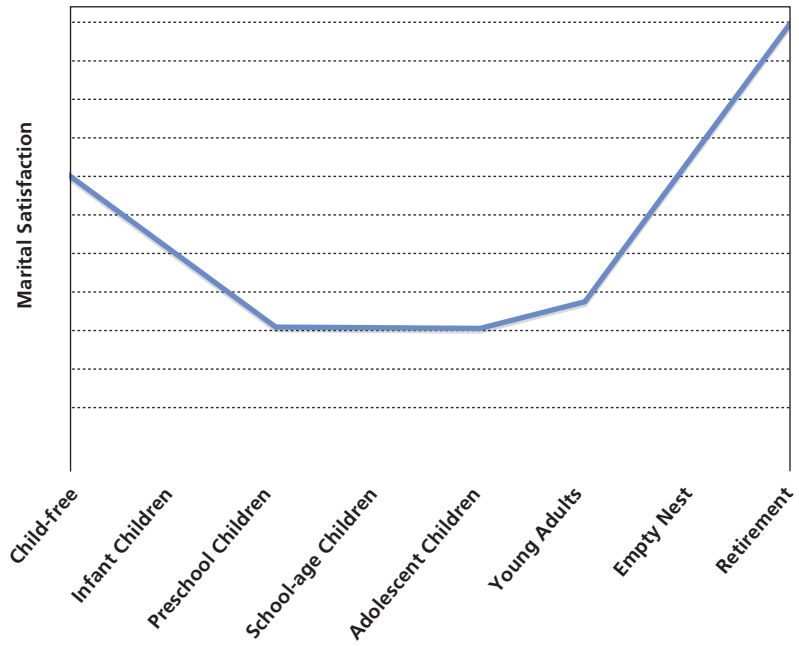
WATCH THIS VIDEO ON MYPSYCHLAB MIDDLE ADULTHOOD: RELATIONSHIPS, JEFF

THE UPS AND DOWNS OF MARRIAGE. Even for happily married couples, marriage has its ups and downs, with satisfaction rising and falling over the course of the marriage. In the past, most research has suggested that marital satisfaction follows the U-shaped configuration shown in Figure 16-3 (Figley, 1973). Specifically, marital satisfaction begins to decline just after the marriage, and it continues to fall until it reaches its lowest point following the births of the couple's children. However, at that point, satisfaction begins to grow, eventually returning to the same level that it

Figure 16-3 The Phases of Marital Satisfaction

For many couples, marital satisfaction falls and rises in a U-shaped configuration. It begins to decline after the birth of children but increases when the youngest child leaves home and eventually returns to a level of satisfaction similar to that at the start of marriage. Why do you think this pattern of satisfaction occurs?

(**Source:** Based on Rollins & Cannon, 1974.)



held before the marriage (Gorchoff, John, & Helson, 2008; Medina, Lederhos, & Lillis, 2009; Stroope, McFarland, & Uecker, 2015).

Middle-aged couples cite several sources of marital satisfaction. For instance, both men and women typically state that their spouse is their "best friend" and that they like their spouses as people. They also view marriage as a long-term commitment and agree on their aims and goals. Finally, most also feel that their spouses have grown more interesting over the course of the marriage (Levenson, Carstensen, & Gottman, 1993).

Sexual satisfaction is related to general marital satisfaction. What matters is not how often married people have sex. Instead, satisfaction is related to *agreeing* about the quality of their sex lives (Spence, 1997; Litzinger & Gordon, 2005; Butzer & Campbell, 2008).

Are there "secrets" to successful marriages? Not really. However, there are proven coping mechanisms that allow couples to remain together happily. Among them (Orbuch, 2009; Bernstein, 2010):

- ***Holding realistic expectations.*** Successful couples understand that there are some things about their partner that they may not like all that much. They accept that their partner will do things that they don't like some of the time.
- ***Focusing on the positive.*** Thinking about the things that they like about their partner helps them to accept the things that bother them.
- ***Compromising.*** Partners in successful marriages understand that they are not going to win every argument, and they don't keep score.
- ***Avoiding suffering in silence.*** If something does bother them, they let their partner know about it. But they don't bring it up in an accusatory way. Instead, they talk about it at a time when they are both calm.

DIVORCE

Louise knew after two months that the marriage was doomed. Tom never listened to a word she said, never asked her how her day had been, never lifted a hand to help around the house. He was completely self-centered and seemingly unaware of her existence. Still, it took 23 years before she got up the nerve to tell him she wanted a divorce. His response

was casual: "What took you so long? I always wondered why you stayed with me." After her initial relief that there would be no resistance, she felt betrayed and foolish. All the anguish, all the trying to make a go of it, all the pain of a bad marriage—and they both knew all along that there was no point. "Why did we never face facts?" she wondered.

Although the overall divorce rate has declined in the last two decades, divorce among couples during midlife is actually rising. One woman in eight who is in her first marriage will get divorced after the age of 40, and one in four of all divorces were by people 50 and older. In fact, the divorce rate for people 50 and over has doubled in the last 20 years and is expected to increase (see Figure 16-4; Enright, 2004; Brown & Lin, 2012; Thomas, 2012).

Why do marriages unravel? There are many causes. One is that people in middle adulthood spend less time together than in earlier years. In individualistic Western cultures, people feel concerned with their own personal happiness and self-fulfillment. If their marriage is not satisfying, they feel that divorce may be the answer to increasing their happiness. Divorce is also more socially acceptable than in the past, and there are fewer legal impediments to divorces. In some cases—but certainly not all—the financial costs are not high. Furthermore, as the opportunities for women grow, wives may feel less dependent on their husbands, both from an emotional and an economic standpoint (Fincham, 2003; Brown & Lin, 2012; Canham et al., 2014).

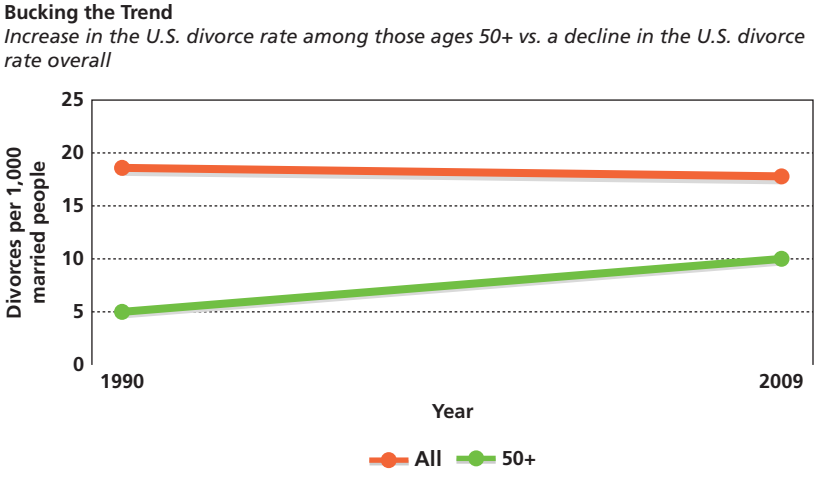
Another reason for divorce is that, as we discussed in Chapter 14, feelings of romantic, passionate love may subside over time. Because Western culture emphasizes the importance of romance and passion, members of marriages in which passion has declined may feel that that is a sufficient reason to divorce. In some marriages, it is a lack of excitement and an increase in boredom that leads to marital dissatisfaction. Finally, there is a great deal of stress in households in which both parents work, and this stress puts a strain on marriages. Much of the energy directed toward families and maintaining relationships in the past is now directed toward work and other institutions outside the home (Macionis, 2001; Tsapelas, Aron, & Orbuch, 2009).

Finally, some marriages end because of *infidelity*, in which a spouse engages in sexual activity with a person outside of the marriage. Although statistics are highly suspect—if you lie to your spouse, why would you be truthful to a pollster?—one survey found that in a given year, about 12 percent of men and 7 percent of women say they have had sex outside their marriage (Atkins & Furrow, 2008; Steiner et al., 2015).

Whatever the causes, divorce can be especially difficult for men and women in midlife. It can be particularly hard for women who have followed the traditional female role of

Figure 16-4 Rising Divorces in Middle Adulthood

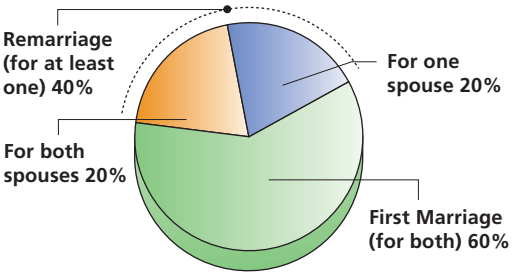
Both the divorce rate and the number of people that experience divorce in those 50 years and above have risen significantly, and the increases are projected to continue in the future.
(**Source:** Brown & Lin, 2012, Figure 1.)



Source: The Gray Revolution; Susan Brown and I-Fen Lin, Bowling Green State University.

Figure 16-5 New Marriages Involving Remarriages

(**Source:** http://www.pewsocialtrends.org/2014/11/14/four-in-ten-couples-are-saying-i-do-again/)



staying with their children and never performing substantial work outside the home. They may face prejudice against older workers, finding that they are less likely to be hired than younger people, even in jobs with minimal requirements. Without a good deal of training and support, these divorced women, lacking recognized job skills, may remain virtually unemployable (McDaniel & Coleman, 2003; Williams & Dunne-Bryant, 2006; Hilton & Anderson, 2009).

At the same time, many people who divorce in midlife end up happy with the decision. Women, in particular, are apt to find that developing a new, independent self-identity is a positive outcome. Furthermore, both men and women who divorce during midlife are likely to enter new relationships, and—as we will see—they typically remarry (Enright, 2004; Koren, 2014).

REMARRIAGE. Many of the people who divorce—some 75 to 80 percent—end up marrying again, usually within 2 to 5 years. In fact, 4 in 10 new marriages involve remarriage (see Figure 16-5). They are most likely to marry people who have also been divorced, partly because divorced people tend to be the ones in the available pool, but also because those who have gone through divorce share similar experiences (Pew Research Center, 2014).

Although the overall rate of remarriage is high, it is far higher in some groups than in others. For instance, it is harder for women to remarry than men, particularly older women. Whereas 90 percent of women under the age of 25 remarry after divorce, less than one-third of women over the age of 40 remarry (Bumpass, Sweet, & Martin, 1990; Besharov & West, 2002).

The reason for this age difference stems from the *marriage gradient*: Societal norms push men to marry women who are younger, smaller, and lower in status than themselves. As a consequence, the older a woman is, the fewer the socially acceptable men she has available to her because those men her age are likely to be looking for younger women. In addition, women have the disadvantage of societal double standards regarding physical attractiveness. Older women tend to be perceived as unattractive, while older men tend to be seen as "distinguished" and "mature" (Bernard, 1982; Buss, 2003; Doyle, 2004a).

There are several reasons divorced people may find getting married again more appealing than remaining single. One motivation to remarry is to avoid the social consequences of divorce. Even in the twenty-first century, when the breakup of marriages is common, divorce carries with it a certain stigma that people may attempt to overcome by remarrying. In addition, divorced people overall report lower levels of satisfaction with life than married people (Lucas, 2005).

Divorced people miss the companionship that marriage provides. Divorced men in particular report feeling lonely and experience an increase in physical and mental health problems following divorce. Finally, marriage provides clear economic benefits reserved for spouses, such as sharing the cost of a house and medical benefits (Ross, Microwsky, & Goldsteen, 1991; Stewart et al., 1997).

Second marriages are not the same as first marriages. Older couples tend to be more mature and realistic in their expectations of a partner and a marriage. They tend to look at marriage in less romantic terms than younger couples, and they are more cautious. They are also likely to show greater flexibility in terms of roles and duties; they share household chores more equitably and make decisions in a more participatory manner (Hetherington, 1999).

Unfortunately, however, this doesn't make second marriages more durable than first ones. In fact, the divorce rate for second marriages is slightly higher than for first marriages. Several factors explain this phenomenon. One is that second marriages may be subject to stresses that are not present in first marriages, such as the strain of blending different families. For another, having experienced and survived divorce before, partners in second marriages may be less committed to relationships and more ready to walk away from unsatisfactory ones. Finally, they may have personality and emotional characteristics that don't make them easy to live with (Warshak, 2000; Coleman, Ganong, & Weaver, 2001).

Despite the high divorce rate for second marriages, many people settle into remarriage quite successfully. In such cases, remarried couples report as great a degree of

satisfaction as couples in successful first marriages (Michaels, 2006; Ayalon & Koren, 2015).

Family Evolutions: From Full House to Empty Nest

LO 16.5 Differentiate the changing family situations middle-aged adults face.

Leaving their youngest child at college marks the start of a significant transition for parents, who face an "empty nest."

For many parents, a major transition that typically occurs during middle adulthood is the departure of children, who may be either going to college, getting married, joining the military, or taking a job far from home. Even people who become parents at relatively late ages are likely to experience this transition at some point during middle adulthood, since the period spans nearly a quarter century. As we saw in the description of Kathy and Bob, a child's departure can be a wrenching experience—so wrenching, in fact, that it has been labeled the "empty nest syndrome." The **empty nest syndrome** refers to instances in which parents experience unhappiness, worry, loneliness, and depression from their children's departure from home (Lauer & Lauer, 1999).

empty nest syndrome
the experience that relates to parents' feelings of unhappiness, worry, loneliness, and depression resulting from their children's departure from home

Many parents report that major adjustments are required. Particularly for women who have stayed home to rear their children, the loss can be difficult. Certainly, if traditional homemakers have little or nothing else in their lives except their children, they do face a challenging period.

While coping with the feelings of loss can be difficult, parents can also find that some aspects of this era of middle adulthood are quite positive. Even mothers who have not worked outside the home find that after the children leave, they have time for other outlets for their physical and psychological energies, such as community or recreational activities. Moreover, they may feel that they now have the opportunity to get a job or to go back to school. Finally, many mothers find that the period of motherhood is not easy; surveys show that most people feel that being a mother is harder than it used to be. Such mothers may now feel liberated from a comparatively difficult set of responsibilities (Heubusch, 1997; Morfei et al., 2004; Chen, Yang, & Aagard, 2012).

Consequently, although some feelings of loss over the departure of children are common for most people, there is little, if any, evidence to suggest that the departure of children produces anything more than temporary feelings of sadness and distress. This is especially true for women who have been working outside the home (Antonucci, 2001; Crowley, Hayslip, & Hobdy, 2003; Kadam, 2014).

In fact, there are some discernible benefits when children leave home. Married spouses have more time for one another. Married or unmarried people can throw themselves into their own work without having to worry about helping the kids with homework, carpools, and the like (Gorchoff, John, & Helson, 2008).

Keep in mind that most research examining the so-called empty nest syndrome has focused on women. Because men traditionally are not as involved as women in childrearing, it was assumed that the transition when children left home would be relatively smooth for men. However, men also may experience feelings of loss when their children depart, although the nature of that loss may be different from that experienced by women.

One survey of fathers whose children had left home found that although most fathers expressed either happy or neutral feelings about the departure of their children, almost a quarter felt unhappy (Lewis, Freneau, & Roberts, 1979). Those fathers tended to mention lost opportunities, regretting things that they had not done with their children. For instance, some felt that they had been too busy for their children or hadn't been sufficiently nurturing or caring.

Some parents react to the departure of their children by becoming what have become known as *helicopter parents*, parents who intrusively intervene in their children's lives. Helicopter parenting is seen when parents micro-manage their children's college careers, complaining to instructors and administrators about poor grades that their children received or seeking to get them into certain classes. In some cases, the phenomenon has started earlier: parents of elementary school-age children sometimes exhibit the same tendencies.

In in extreme cases, helicopter parenting extends to the workplace; some employers complain that parents call human relations departments to extol the virtues of their children as potential employees. Although statistics about the prevalence of helicopter parenting are hard to come by, it is clear that the phenomenon is real. One survey of 799 employers found that nearly a third said that parents had submitted resumes for their child, sometimes not even informing their son or daughter. One-quarter said that parents had contacted them, urging them to hire their son or daughter. And 4 percent said that a parent had accompanied the child on a job interview. Some parents even help their children complete work assignments once they get a job (Gardner, 2007; Ludden, 2012).

In most cases, though, parents permit their children to develop independently once they leave home. On the other hand, children may not always leave home for good, and the empty nest sometimes becomes replenished with what have been called "boomerang children," as we discuss next.

BOOMERANG CHILDREN: REFILLING THE EMPTY NEST

Carole Olis doesn't know what to make of her 23-year-old son, Rob. He has been living at home since his graduation from college more than two years ago. "I ask him, 'Why don't you move out with your friends?'" says Carole, shaking her head. Rob has a ready answer: "They all live at home, too."

boomerang children
young adults who return, after leaving home for some period, to live in the homes of their middle-aged parents

sandwich generation
couples who in middle adulthood must fulfill the needs of both their children and their aging parents

Carole Olis is not alone in being surprised and somewhat perplexed by the return of her son. There has been a significant increase in the United States in the number of young adults who come back to live in the homes of their middle-aged parents.

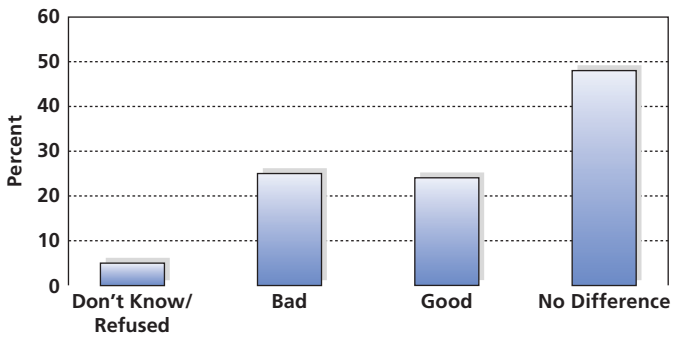
Known as **boomerang children**, these returning offspring typically cite economic issues as the main reason for coming back home. Because of a difficult economy, many young adults cannot find jobs after college, or the positions they do find pay so little that they have difficulty making ends meet. Others return home after the breakup of a marriage. Overall, close to one-third of young adults ages 25 to 34 are living with their parents. In some European countries, the proportion is even higher (Roberts, 2009; Parker, 2012).

Because about half of boomerang children pay rent to their parents, parental finances may benefit. The arrangement doesn't seem to effect social relationships within the family: half say it makes no difference or is a plus. Only a quarter of boomerang children find the arrangement has been bad for their relationship with their parents (Parker, 2012; see Figure 16-6).

Figure 16-6 More Boomerang Children, Enjoying It Less

The percentage of those saying that living with their parents at this stage of life has been bad, good, or no different in terms of their relationship.

(**Source:** Pew Research Center, 2012.)



THE SANDWICH GENERATION: BETWEEN CHILDREN AND PARENTS. At the same time children are leaving the nest, or perhaps even returning as boomerang children, many middle-aged adults face another challenge: growing responsibility for the care of their own aging parents. The term **sandwich generation** has come to be applied to these middle adults who feel squeezed between the needs of both their children and their aging parents (Riley & Bowen, 2005; Grundy & Henretta, 2006; Chassin et al., 2009).

Being part of the sandwich generation is a relatively new phenomenon, produced by several converging trends. First, both men and women are marrying later and having children at an older age. At the same time, people are living longer. Consequently, the likelihood is growing that those

in middle adulthood will simultaneously have children who still require a significant amount of nurturing and parents who are still alive and in need of care.

The care of aging parents can be psychologically tricky. For one thing, there is a significant degree of role reversal, with children taking on the parental role and parents in a more dependent position. Furthermore, older people, who were previously independent, may resent and resist their children's efforts to help. They certainly do not want to be burdens on their children. For instance, almost all elderly people who live alone report that they do not wish to live with their children (Merrill, 1997).

People in middle adulthood provide a range of care for their parents. In some cases, the care is merely financial, such as helping them make ends meet on meager pensions. In other situations, it takes the form of help in managing a household, such as taking down storm windows in the spring or shoveling snow in the winter.

In more extreme cases, elderly parents may be invited to live in the home of a son or daughter. Census data reveal that the multigenerational household, which includes three or more generations, is the fastest-growing household arrangement of any sort. Multigenerational households increased by more than a third between 1990 and 2000, and they represent 4 percent of all households (Navarro, 2006).

Multigenerational families present a tricky situation, as parental and children's roles are renegotiated. Typically, the adult children in the middle generation—who, after all, are no longer children—are in charge of the household. Both they and their parents must adjust to the changing relationships and find some common ground in making decisions. Elderly parents may find the loss of independence particularly difficult, and this can be wrenching for their adult child as well. The youngest generation may resist the inclusion of the oldest generation.

In many cases, the burden of caring for aging parents is not shared equally, with the larger share most often taken on by women. Even in married couples where both husband and wife are in the labor force, middle-aged women tend to be more involved in the day-to-day care of aging parents, even when the parent or parents are their in-laws (Soldo, 1996; Putney & Bengtson, 2001).

Culture also influences how caregivers view their roles. For example, members of Asian cultures, which are more collectivistic, are more likely to view caregiving as a traditional and not-out-of-the-ordinary duty. In contrast, members of more individualistic cultures may perceive familial ties as less central, and caring for a member of an older generation may be experienced as more burdensome (Ho et al., 2003; Kim & Lee, 2003; Ron, 2014).

Despite the burden of being sandwiched in the middle of two generations, which can stretch the caregiving child's resources, there are also significant rewards. The psychological attachment between middle-aged children and their elderly parents can continue to grow. Both partners in the relationship can see each other more realistically. They can become closer, more accepting of each other's weaknesses, and more appreciative of each other's strengths (Mancini & Blieszner, 1991; Vincent, Phillipson, & Downs, 2006).

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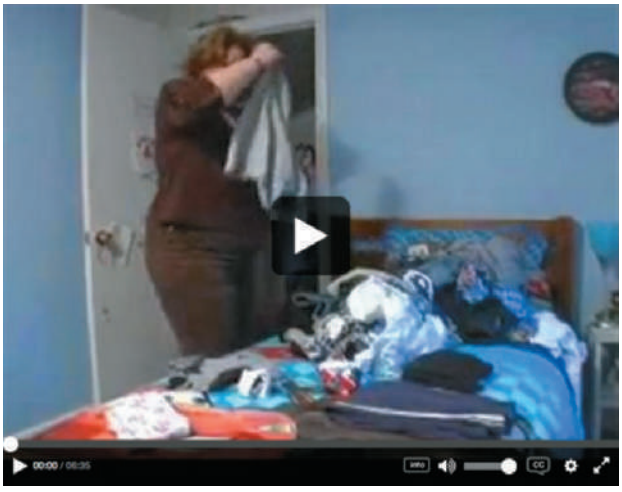
SANDWICH GENERATION: AMY, 42



Becoming a Grandparent: Who, Me?

LO 16.6 Describe how people in middle adulthood react to becoming grandparents.

When her eldest son and daughter-in-law had their first child, Leah couldn't believe it. At age 54, she had become a grandmother! She kept telling herself that she felt far too young to be considered anybody's grandparent.

Middle adulthood often brings one of the unmistakable symbols of aging: becoming a grandparent. For some people, becoming a grandparent has been eagerly awaited. They may miss the energy and excitement and even demands of young children, and they may see grandparenthood as the next stage in the natural progression of life. Others are less pleased with the prospect of grandparenthood, seeing it as a clear signpost of aging.

Grandparenting tends to fall into different styles. *Involved* grandparents are actively engaged in grandparenting and have influence over their grandchildren's lives. They hold clear expectations about the ways their grandchildren should behave. A retired grandmother or grandfather who takes care of a grandchild several days a week while her parents are at work is an example of an involved grandparent (Mueller, Wilhelm, & Elder, 2002; Fergusson, Maughan, & Golding, 2008).

In contrast, *companionate* grandparents are more relaxed. Rather than taking responsibility for their grandchildren, companionate grandparents act as supporters and buddies to them. Grandparents who visit and call frequently, and perhaps occasionally take their grandchildren on vacations or invite them to visit without their parents, are practicing the companionate style of grandparenting.

WATCH THIS VIDEO ON MYPSYCHLAB
BECOMING A GRANDPARENT

Finally, the most aloof type of grandparents are *remote*. Remote grandparents are detached and distant, and they show little interest in their grandchildren. Remote grandparents, for example, would rarely make visits to see their grandchildren and might complain about their childish behavior when they did see them.

There are marked gender differences in the extent to which people enjoy grandparenthood. Generally, grandmothers are more interested and experience greater satisfaction than grandfathers, particularly when they have a high level of interaction with younger grandchildren (Smith & Drew, 2002).

Furthermore, African American grandparents are more apt to be involved with their grandchildren than white grandparents. The most reasonable explanation for this phenomenon is that the prevalence of three-generation families who live together is greater among African Americans than among Caucasians. In addition, African American families, which are more likely than white families to be headed by single parents, often rely substantially on the help of grandparents in everyday child care, and cultural norms tend to be highly supportive of grandparents taking an active role (Stevenson, Henderson, & Baugh, 2007; Keene, Prokos, & Held, 2012; Cox & Miner, 2014).

Family Violence: The Hidden Epidemic

LO 16.7 List the causes and characteristics of family violence in the United States.

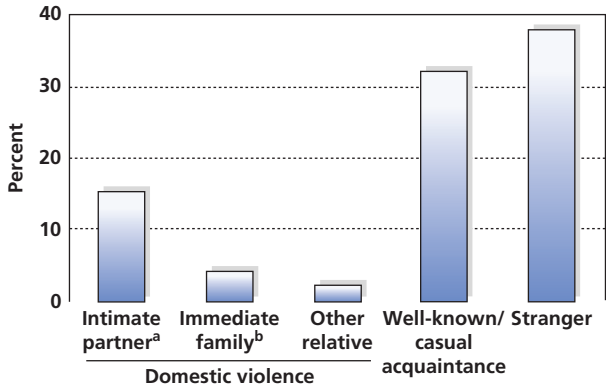
> *After finding an unidentified earring, the wife accused her husband of being unfaithful. His reaction was to throw her against the wall of their apartment, and then to toss her clothes out the window. In another incident, the husband became angry. Screaming at his wife, he threw her against a wall, and then picked her up and literally threw her out of the house. Another time, the wife called 911, begging for the police to protect her. When the police came, the woman, with a black eye, a cut lip, and swollen cheeks, hysterically screamed, "He's going to kill me."*

Unfortunately, the scene described above is far from rare. Violence, both physical and psychological, is part of many relationships.

THE PREVALENCE OF SPOUSAL ABUSE. Domestic violence is one of the ugly truths about marriage in the United States, occurring at epidemic levels. Some form of violence happens in one-fourth of all marriages, and more than half the women who were murdered in one recent 10-year period were murdered by a partner. Between 21 and 34 percent of women will be slapped, kicked, beaten, choked, or threatened or attacked with a weapon at least once by an intimate partner. In fact, close to 15 percent of all marriages in the United States are characterized by continuing, severe violence. Furthermore, domestic violence is a worldwide problem. Estimates suggest that one in three women throughout the globe experience some form of violent victimization during their lives (Garcia-Moreno et al., 2005; also see Figure 16-7).

In the United States, no segment of society is immune from spousal abuse. Violence occurs across social strata, races, ethnic groups, and religions. Both gay and straight

Figure 16-7 Violent Victimization by Victim–Offender Relationship, 2003–2012
(Source: Truman & Morgan, 2014—original source at http://www.bjs.gov/content/pub/pdf/ndv0312.pdf)



[a]Includes current or former spouses, boyfriends, and girlfriends.
[b]Includes parents, children, and siblings.

partnerships can be abusive. It also occurs across genders: Although in the vast majority of cases of abuse a husband batters a wife, in about 8 percent of the cases wives physically abuse their husbands (Cameron, 2003; Dixon & Browne, 2003; Yon et al., 2014).

Certain factors increase the likelihood of abuse. For instance, spousal abuse is more likely to occur in large families in which there is continuing economic concern and a high level of verbal aggression than families in which such factors are not present. Those husbands and wives who grew up in families where violence was present are more likely to be violent themselves (Ehrensaft, Cohen, & Brown, 2003; Lackey, 2003).

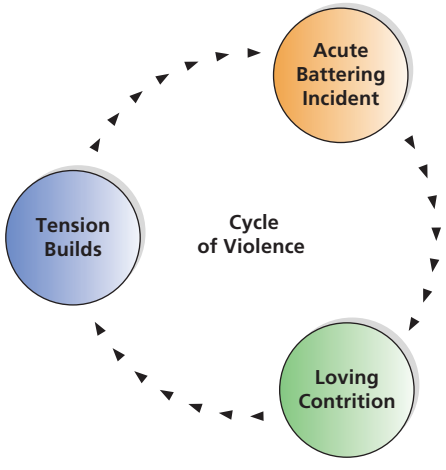
The factors that put a family at risk are similar to those associated with child abuse, another form of family violence. Child abuse occurs most frequently in stressful environments, in lower socioeconomic levels, in single-parent families, and in situations with high levels of marital conflict. Families with four or more children have higher rates of abuse, and those with incomes lower than $15,000 a year have abuse rates that are seven times higher than families with higher incomes. But not all types of abuse are higher in poorer families: Incest is more likely to occur in affluent families (APA, 1996; Cox, Kotch, & Everson, 2003).

THE STAGES OF SPOUSAL ABUSE. Marital aggression by a husband typically occurs in three stages (Walker, 1989; see Figure 16-8). The first is the *tension-building* stage in which a batterer becomes upset and shows dissatisfaction initially through verbal abuse. He may also show some preliminary physical aggression in the form of shoving or grabbing. The wife may desperately try to avoid the impending violence, attempting to calm her spouse or withdraw from the situation. Such behavior may serve only to enrage the husband, who senses his wife's vulnerability, and her efforts to escape may lead to an escalation of his anger.

The next stage consists of an *acute battering incident*, when the physical abuse actually occurs. It may last from several minutes to hours. Wives may be shoved against walls, choked, slapped, punched, kicked, and stepped on. Their arms may be twisted or broken, they may be shaken severely, thrown down a flight of stairs, or burned with cigarettes or scalding liquids. About a quarter of wives are forced to engage in sexual activities during this period, which takes the form of aggressive sexual acts and rape.

Finally, in some—but not all—cases, the episode moves into the *loving contrition* stage. At this point, the husband feels remorse and apologizes for his actions. He may minister to his wife, providing first aid and sympathy, and assuring her that he will never act violently again. Because wives may feel that in some way they were partly at fault in triggering the aggression, they may be motivated to accept the apology and forgive their husbands. They want to believe that the aggression will never occur again.

Figure 16-8 The Stages of Violence
(Source: Adapted from Walker, 1979, 1984; Gondolf, 1985.)



The loving contrition stage helps explain why many wives remain with abusive husbands and are the continuing victims of abuse. Wishing desperately to keep their marriages intact, and believing that they have no good alternatives, some wives remain out of a vague sense that they are responsible for the abuse. Others remain out of fear: They are afraid their husbands may come after them if they leave.

THE CYCLE OF VIOLENCE. Still other wives stay with batterers because they, like their husbands, have learned a seemingly unforgettable lesson from childhood: Violence is an acceptable means of settling disputes.

cycle of violence hypothesis
the theory that abuse and neglect of children leads them to be predisposed to abusiveness as adults

Individuals who abuse their spouses and children were often as children the victims of abuse themselves. According to the **cycle of violence hypothesis**, abuse and neglect of children leads them to be predisposed to abusiveness as adults. In line with social learning theory, the cycle of violence hypothesis suggests that family aggression is perpetuated from one generation to another as family members follow the lead of the previous generation. It is a fact that individuals who abuse their wives often have been raised in households in which they have witnessed spousal abuse, just as parents who abuse their children frequently have been the victims of abuse themselves as children (Serbin & Karp, 2004; Renner & Slack, 2006; Whiting et al., 2009; Eriksson & Mazerolle, 2015).

From *a health-care provider's* perspective

What can be done to end the cycle of violence, in which people who were abused as children grow up to be abusers of others?

Growing up in a home where abuse occurs does not invariably lead to abusiveness as an adult. Only about one-third of people who were abused or neglected as children abuse their own children as adults, and two-thirds of abusers were not themselves abused as children. The cycle of violence, then, does not tell the full story of abuse (Jacobson & Gottman, 1998).

Whatever the causes of abuse, there are ways to deal with it, as we consider next.

SPOUSAL ABUSE AND SOCIETY: THE CULTURAL ROOTS OF VIOLENCE. Although the tendency often is to see marital violence and aggression as a particularly North American phenomenon, in fact other cultures have traditions in which violence is regarded as acceptable (Rao, 1997). For instance, wife battering is particularly prevalent in cultures in which women are viewed as inferior to men and are treated as property.

In Western societies too, wife beating was acceptable at one time. According to English common law, which formed the foundation of the legal system in the United States, husbands were allowed to beat their wives. In the 1800s, this law was modified to permit only certain kinds of beating. Specifically, a husband could not beat his wife with a stick or rod that was thicker than his thumb—the origin of the phrase "rule of thumb." It was not until the late nineteenth century that this law was removed from the books in the United States (Davidson, 1977).

Some experts on abuse suggest that the traditional power structure under which women and men function is a root cause of abuse. They argue that the more a society differentiates between men and women in terms of status, the more likely it is that abuse will occur.

As evidence, they point to research examining the legal, political, educational, and economic roles of women and men. For example, some research has compared battering statistics across the various states in the United States. Abuse is more likely to occur in states where women are of particularly low or high status compared with women's status in other states. Apparently, relatively low status makes women easy targets of violence. Conversely, unusually high status may make husbands feel threatened and consequently more likely to behave abusively (Vandello & Cohen, 2003). (Also see the *Are You an Informed Consumer of Development?* box.)

Are You an Informed Consumer of Development?

Dealing with Spousal Abuse

Despite the fact that spousal abuse occurs in some 25 percent of all marriages, efforts to deal with victims of abuse are underfunded and inadequate to meet current needs. Some psychologists argue that the same factors that led society to underestimate the magnitude of the problem for many years now hinder the development of effective interventions. Still, there are several measures to help the victims of spousal abuse (Dutton, 1992; Browne, 1993; Koss et al., 1993).

- Teach both wives and husbands a basic premise: Physical violence is *never*, under *any* circumstances, an acceptable means of resolving disagreements.
- Call the police. It is against the law to assault another person, including a spouse. Although it may be difficult to involve law enforcement officers, this is a realistic way of dealing with domestic abuse. Judges can also issue restraining orders requiring abusive husbands to stay away from their wives.
- Understand that the remorse shown by a spouse, no matter how heartfelt, may have no bearing on the possibility of future violence. Even if a husband shows loving regret after a battering session and vows that he will never be violent again, such a promise is no guarantee against future abuse.
- If you are the victim of abuse, seek a safe haven. Many communities have shelters for the victims of domestic violence that can house women and their children. Because addresses of shelters are kept confidential, an abusive spouse will not be able to find you. Telephone numbers are on the web (start with www.thehotline.org for the National Domestic Violence Hotline), and local police should also have the numbers.
- If you feel in danger from an abusive partner, seek a restraining order from a judge in court. Under a restraining order a spouse is forbidden to come near you, under penalty of law.
- Call the National Domestic Violence Hotline at 1-800-799-7233 for immediate advice.

Module 16.2 Review

- For most couples, marital satisfaction rises during middle adulthood.
- Family changes in middle adulthood include the departure of children. In recent years, the phenomenon of "boomerang children" has emerged. Middle-aged adults often have increasing responsibilities for their aging parents.
- Many middle-aged adults experience grandparenthood for the first time. Typically, grandparents may be involved, companionate, or remote.
- Marital violence tends to pass through three stages: tension building, an acute battering incident, and loving contrition. The incidence of family violence is highest in families of lower socioeconomic status. A "cycle of violence" affords a partial explanation. Cultural norms may also play a role.

Journal Writing Prompt

Applying Lifespan Development: Are the concepts of helicopter parents, empty nest syndrome, boomerang children, and the sandwich generation dependent on culture? Do these phenomena exist in your culture? If so, how are they perceived?

Work and Leisure

Enjoying a weekly game of golf . . . starting a neighborhood watch program . . . coaching a Little League baseball team . . . joining an investment club . . . traveling . . . taking a cooking class . . . attending a theater series . . . running for the local town council . . . going to the movies with friends . . . hearing lectures on Buddhism . . . fixing up a porch in the back of the house . . . chaperoning a high-school class on an out-of-state trip . . . lying on a beach in Duck, North Carolina, reading a book during an annual vacation . . .

When we look at what people in the middle years of adulthood actually do, we find activities as varied as the individuals themselves. Although for most people middle adulthood represents the peak of on-the-job success and earning power, it is also a time when people throw themselves into leisure and recreational activities. In fact, middle

age may be the period when work and leisure activities are balanced most easily. No longer feeling that they must prove themselves on the job, and increasingly valuing the contributions they are able to make to family, community, and—more broadly—society, middle-aged adults may find that work and leisure complement one another in ways that enhance overall happiness.

Work and Careers: Jobs at Midlife

LO 16.8 Summarize characteristics of work and career in middle adulthood.

For many, middle age is the time of greatest productivity, success, and earning power. It is also a time when occupational success may become considerably less alluring than it once was. This is particularly the case for those who may not have achieved the occupational success they had hoped for when they began their careers. In such cases, work becomes less valued, while family and other off-the-job interests become more important (Howard, 1992; Simonton, 1997).

WATCH THIS VIDEO ON MYPSYCHLAB MIDDLE ADULTHOOD: WORK, MARY

The factors that make a job satisfying change during middle age. Younger adults are interested in abstract and future-oriented concerns, such as the opportunity for advancement or the possibility of recognition and approval. Middle-aged employees care more about the here-and-now qualities of work. For instance, they are more concerned with pay, working conditions, and specific policies, such as the way vacation time is calculated. Furthermore, as at earlier stages of life, changes in overall job quality are associated with changes in stress levels for both men and women (Cohrs, Abele, & Dette, 2006; Rantanen et al., 2012; Hamlet & Herrick, 2014).

In general, though, the relationship between age and work seems to be positive: The older workers are, the more overall job satisfaction they experience. This pattern is not altogether surprising, since younger adults who are dissatisfied with their positions will quit them and find new positions that they like better. Furthermore, older workers have fewer opportunities to change positions. Consequently, they may learn to live with what they have, and accept that the position they have is the best they are likely to get. Such acceptance may ultimately be translated into satisfaction (Tangri, Thomas, & Mednick, 2003). (Also see the *From Research to Practice* box).

CHALLENGES OF WORK: ON-THE-JOB DISSATISFACTION

> *For 44-year-old Peggy Augarten, early-morning shifts in the intensive care unit of the suburban hospital where she worked were becoming increasingly difficult. Although it had always been hard to lose a patient, recently she found herself breaking into tears over her patients at the strangest moments: while she was doing the laundry, washing the dishes, or watching TV. When she began to dread going to work in the morning, she knew that her feelings about her job were undergoing a fundamental change.*

Job satisfaction is not universal in middle adulthood. For some people, work becomes increasingly stressful as dissatisfaction with working conditions or with the nature of the job mounts. In some cases, conditions become so bad that the result is burnout or a decision to change jobs. Peggy Augarten's response can probably be traced to the phenomenon of burnout. **Burnout** occurs when workers experience dissatisfaction, disillusionment, frustration, and weariness from their jobs. It occurs most often in jobs that involve helping others, and it often strikes those who initially were the most idealistic and driven. In some ways, such workers may be overcommitted to their jobs, and the realization that they can make only minor dents in huge societal problems, such as poverty and medical care can be disappointing and demoralizing (Bakker & Heuven, 2006; Dunford et al., 2012; Rössler et al., 2015).

burnout
a situation that occurs when workers experience dissatisfaction, disillusionment, frustration, and weariness from the job

One of the consequences of burnout is a growing cynicism about one's work. For instance, an employee might say to himself, "What am I working so hard on this for? No one is even going to notice that I've come in on budget for the last two years." In addition,

From Research to Practice

House-Husbands: When Fathers Are the Primary Caregivers for Their Children

In the 1950s family sitcom *Leave it to Beaver*, father Ward Cleaver worked outside the home while mother June stayed at home to do household chores and watch over their two sons, Wally and Beaver. Real family lives in those days tended to look the same, with the husband earning an income while the wife raised the kids. The 1960s and beyond ushered in different variations as women increasingly worked outside the home, but the stay-at-home dad was never common and usually meant that dad was temporarily unemployed and planning to return to the workforce as soon as possible.

That picture has changed a great deal in just the last few years. The number of men who stay at home to care for the home and family has doubled since the start of the millennium. And while many of those men were displaced from the workplace by layoffs, the fastest-growing group is that made up of fathers who stay at home by choice—from 5 percent in 1989 to more than 20 percent today (and that number is likely under-reported due to the lingering stigma of men who choose not to work; Livingston, 2014).

The reasons for this shift are unclear but likely involve a number of factors. One is the gradual change in perceptions of gender roles, especially at home. It wasn't very long ago when men were expected to be the breadwinners and disciplinarians in the home, and a male caretaker was viewed as an oddity—perhaps even as a failure. But decades of dual income families necessitated more equal sharing of the caretaker role, breaking down the rigid expectations of bygone days. Men increasingly feel the pressure of balancing home life with a career, and along with it the temptation to throw in the towel at work and just stay home (Kramer, 2012; Livingston, 2014).

But the bigger reason is likely the expansion of career opportunities for women. Many more women today are pursuing advanced education and succeeding in formerly male-dominated professions, such that the woman of the household is increasingly likely to be the one with the prestigious career and the large income. The decision to have mom continue working while dad stays at home is, therefore, now more likely than ever to simply be the practical one. As women enjoy ever greater upward mobility in the workforce and old rigid beliefs about stereotypical gender roles weaken and fall away, the outcome is that the stay-at-home-dad phenomenon is one we'll continue to see with increasing frequency (Kramer, 2012; Miller, 2014).

Over the past two decades, there has been a significant increase in the number men who stay at home to care for children.

Shared Writing Prompt

Why do you think there is still some stigma attached to men who voluntarily become homemakers?

workers may feel indifference and lack of concern about how well they do their job. The idealism with which a worker may have entered a profession is replaced by pessimism and the attitude that it is impossible to provide any kind of meaningful solution to a problem.

People can combat burnout, even those in professions with high demands and seemingly insurmountable burdens. For example, the nurse who despairs of not having enough time for every patient can be helped to realize that a more feasible goal—such as giving patients a quick backrub—can be equally important. Jobs can also be structured so that workers (and their supervisors) pay attention to small victories in their daily work, such as the pleasure of a client's gratitude, even though the "big picture" of disease, poverty, racism, and an inadequate educational system may look gloomy. In addition, it is important to mentally disengage from work during leisure time (Garcia et al., 2015; Peisah et al., 2009; Sonnentag, 2012).

Unemployment: The Dashing of the Dream

LO 16.9 Describe the effect losing one's job has on a person in middle adulthood.

> *The dream is gone—probably forever. And it seems like it tears you apart. It's just disintegrating away. You look alongside the river banks . . . there's all flat ground. There used to be a big scrap pile there where steel and iron used to be melted and used over again, processed. That's all leveled off. Many a time I pass through and just happen to see it. It's hard to visualize it's not there anymore. (Kotre & Hall, 1990, p. 290)*

It is hard not to view 52-year-old Matt Nort's description of an obsolete Pittsburgh steel mill as symbolic of his own life. Because he has been unemployed for several years, Matt's dreams for occupational success in his own life have died along with the mill in which he once worked.

For many workers, unemployment is a hard reality of life, and the implications of not being able to find work are as much psychological as they are economic. For those who have been fired, laid off by corporate downsizing, or forced out of jobs by technological advances, being out of work can be psychologically and even physically devastating (Sharf, 1992).

Unemployment can leave people feeling anxious, depressed, and irritable. Their self-confidence may plummet, and they may be unable to concentrate. According to one analysis, every time the unemployment rate goes up 1 percent, there is a 4 percent rise in suicide, and admissions to psychiatric facilities go up by some 4 percent for men and 2 percent for women (Inoue et al., 2006; Paul & Moser, 2009).

Even aspects of unemployment that might at first seem positive, such as having more time, can produce disagreeable consequences. Perhaps because of feelings of depression and having too much time on one's hands, unemployed people are less apt to participate in community activities, use libraries, and read than employed people. They are more likely to be late for appointments and even for meals (Ball & Orford, 2002; Tyre & McGinn, 2003).

And these problems may linger. Middle-aged adults who lose their jobs tend to stay unemployed longer than younger workers and have fewer opportunities for gratifying work as they age. Furthermore, employers may discriminate against older job applicants and make it more difficult to obtain new employment. Ironically, such discrimination is not only illegal but is based on misguided assumptions: Research finds that older workers show less absenteeism than younger ones, hold their jobs longer, are more reliable, and are more willing to learn new skills (Bernard, 2012).

In sum, midlife unemployment is a shattering experience. And for some people, especially those who never find meaningful work again, it taints their entire view of the world. For people forced into such involuntary—and premature—retirement, the loss of a job can lead to pessimism, cynicism, and despondency. Overcoming such feelings often takes time and a good deal of psychological adjustment to come to terms with the situation. There are challenges for those who *do* find a new career, too (Waters & Moore, 2002; Pelzer, Schaffrath, & Vernaleken, 2014).

Switching—and Starting—Careers at Midlife

LO 16.10 Explain how and why people change careers in middle adulthood.

For some people, middle adulthood brings with it a hunger for change. For such individuals, who may be experiencing dissatisfaction with their jobs, switching careers after a period of unemployment, or simply returning to a job market they left years before, their developmental paths lead to new careers.

People who change careers in middle adulthood do so for several reasons. It may be that their jobs offer little challenge; they have achieved mastery, and what was once difficult is now routine. Other people change because their jobs have changed in ways they do not like, or they may have lost their job. They may be asked to accomplish more with fewer resources, or technological advances may have made such drastic changes in their day-to-day activities that they no longer enjoy what they do.

Still others are unhappy with the status they have achieved and wish to make a fresh start. Some are burned out or feel that they are on a treadmill. In addition, some people simply do not like to think of themselves doing the same thing for the rest of their lives. For them, middle age is seen as the last point at which they can make a meaningful occupational change (Steers & Porter, 1991).

Finally, a significant number of people, almost all of them women, return to the job market after having taken time off to raise children. Some may need to find paying work after a divorce. Since the mid-1980s, the number of women in the workforce who are in their 50s has grown significantly. Around half of women between the ages of 55 and 64—and an even larger percentage of those who graduated from college—are now in the workforce (see Figure 16-9).

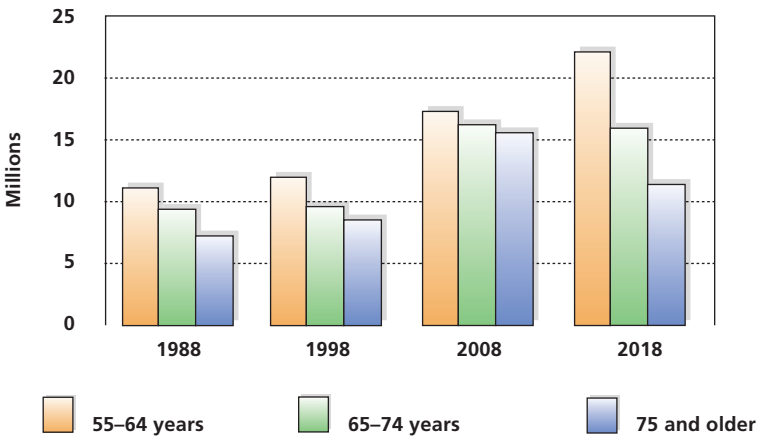
People may enter new professions with unrealistically high expectations and be disappointed by the realities of the situation. Furthermore, middle-aged people who start new careers may find themselves in entry-level positions. As a consequence, their peers on the job may be considerably younger than they are (Sharf, 1992; Barnett & Hyde, 2001). But in the long run, taking on a new career in middle adulthood can be invigorating. Those who switch or start new careers may be especially valued employees (Adelmann, Antonucci, & Crohan, 1990; Connor, 1992; Bromberger & Matthews, 1994).

Some forecasters suggest that career changes may become the rule rather than the exception. According to this point of view, technological advances will occur so rapidly that people will be forced periodically to change what they do to earn a living, often dramatically. In such a scenario, people will have not one, but several, careers during their lifetimes. As the following *Developmental Diversity and Your Life* box makes clear, this is especially true for those who make a major life and career change: immigrating to another country as adults.

Figure 16-9 Women at Work

The percentage of women aged 55 to 64 who are in the labor force has steadily increased since 1980 and is slated to continue to grow over the current decade.

(**Source:** Monthly Labor Review, 2009.)



From *a social worker's* perspective

Why do you think immigrants' ambition and achievements are widely underestimated? Does the occurrence of conspicuous negative examples play a role (as it does in perceptions of the midlife crisis and stormy adolescence)?

In short, the reality is that the majority of immigrants ultimately become contributing members of U.S. society. For instance, they may alleviate labor shortages, and the money they send to relatives who remain at home may invigorate the world economy (World Bank, 2003).

Leisure Time: Life beyond Work

LO 16.11 Describe how people experience leisure time in middle adulthood.

With the typical work week hovering between 35 and 40 hours—and becoming shorter for most people—most middle-aged adults have some 70 waking hours per week at their disposal (Kacapyr, 1997). What do they do with their leisure time?

Developmental Diversity and Your Life

Immigrants on the Job: Making It in America

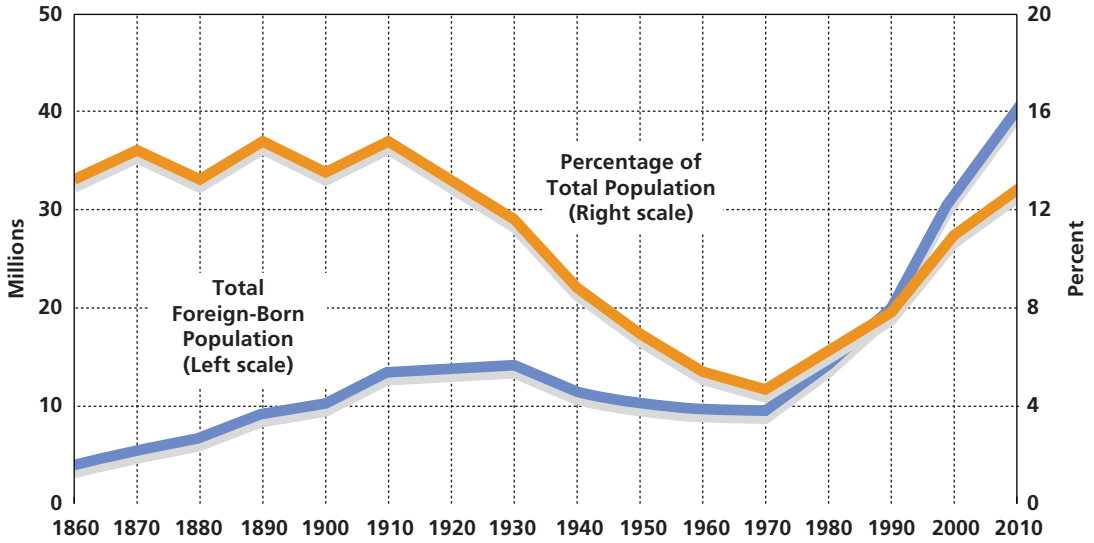
Seventeen years ago, *Mankekolo Mahlangu-Ngcobo was placed in solitary confinement for 21 days in South Africa's Moletsane police station, falsely accused of terrorism. In 1980, once again in danger of imprisonment for her anti-apartheid protests, she fled to Botswana, leaving her 12-year-old son Ratijawe with her mother. She came to the U.S. in 1981, won political asylum in 1984 and now lives with her 13-year-old daughter Ntokozo in a $60,000 Baltimore row house. Her experiences left her with a deep appreciation of her adopted land. "If you have never lived somewhere else," she says, "you cannot know how much freedom you have here."*

Ngcobo also found prosperity here. *As with many of her fellow immigrants, the key was education. Since her arrival, she has earned a bachelor's degree, two master's and a doctorate in theology—which she paid for largely with scholarships or with her own money. Her academic credentials and dedication to helping others have won her two soul-satisfying careers, as a lecturer in public health at Baltimore's Morgan State University and as assistant minister at the Metropolitan African Methodist Episcopal Church in Washington, D.C. (Kim, 1995, p. 133)*

If we rely solely on public opinion, we would probably view immigrants to the United States as straining the educational, prison, welfare, and health-care systems while contributing little to U.S. society. But—as the story of Mankekolo Mahlangu-Ngcobo exemplifies—the assumptions that underlie anti-immigrant sentiment are in fact quite wrong.

Figure 16-10 Immigrants in the United States

Since 1970 the number of immigrants in the United States has steadily climbed and is approaching a historic high, especially if the estimated 16 million undocumented immigrants are included.
(**Source:** Congressional Budget Office, 2013.)



Some 40 million people in the United States were born outside the country, representing close around 15 percent of the population, nearly three times the percentage in 1970. First- and second-generation immigrants comprise almost a quarter of the population of the United States (see Figure 16-10; Congressional Budget Office, 2013).

Today's immigrants are somewhat different from those of the earlier waves at the beginning of the twentieth century. Only a third are white, compared with almost 90 percent of immigrants who arrived before 1960. Critics argue that many new immigrants lack the skills that will allow them to make a contribution to the high-tech economy of the twenty-first century.

The critics are wrong in many fundamental respects. For instance, consider the following data (Camarota, 2001; Flanigan, 2005; Gorman, 2010):

- Most legal and illegal immigrants ultimately succeed financially. For example, although they initially experience higher rates of poverty than native-born Americans, immigrants who arrived in the United States prior to 1980 and have had a chance to establish themselves actually have a higher family income than native-born Americans. Immigrants have the same rate of entrepreneurship as nonimmigrants, with one in nine owning their own business.
- Few immigrants come to the United States to get on welfare. Instead, most say they come because of opportunities to work and prosper in the United States. Nonrefugee immigrants who are old enough to work are less likely to be on welfare than native-born U.S. citizens.
- Given time, immigrants contribute more to the economy than they take away. Although initially costly to the government, often because they hold low-paying jobs and therefore pay no income taxes, immigrants become more productive as they get older.

Why are immigrants often ultimately financially successful? One explanation is that immigrants who voluntarily choose to leave their native countries are particularly motivated and driven to be successful, whereas those who choose *not* to immigrate may be relatively less motivated.

For one thing, they watch television. On average, middle-aged people watch around 15 hours of television each week. But middle-aged adults do much more with their leisure time than watch television. For many people, middle adulthood represents a renewed opportunity to become involved in activities outside the home. As children leave home, parents have substantial time freed up to participate more extensively in leisure activities, such as taking up sports, or civic participation, such as joining town committees. Middle-aged adults in the United States spend about 6 hours each week socializing (Robinson & Godbey, 1997; Lindstrom et al., 2005).

A significant number of people find the allure of leisure so great that they take early retirement. For those who make such a choice, and who have adequate financial resources to last the dozens of years that likely remain to them, life can be quite gratifying. Early retirees tend to be in good health, and they may take up a variety of new activities.

Although middle adulthood presents the opportunity for more leisure activities, most people report that the pace of their lives does not seem slower. Because they are involved in a variety of activities, much of their free time is scattered throughout the week in 15- and 30-minute chunks. Consequently, despite a documented increase of five hours of weekly leisure time since 1965, many people feel they have no more free time than they did earlier (Robinson & Godbey, 1997).

One reason why extra leisure time may not be noticeable is that the pace of life in the United States is still considerably faster than in many countries. By measuring the length of time average pedestrians cover 60 feet, the time it takes for a customer to purchase a stamp, and the accuracy of public clocks, research has compared the tempo of living in a variety of countries. According to a composite of these measures, the United States has a quicker tempo than many other countries, particularly Latin American, Asian, Middle Eastern, and African countries. On the other hand, many countries outpace the United States. For example, Western European countries and Japan operate more quickly than the United States, with Switzerland ranking first (see Table 16-2; Levine, 1997a, 1997b).

Table 16-2 Comparative Pace of Life (Rank #1 = Highest Pace)

Rank	Overall Pace of Life	Time to Walk 60 Feet	Time to Buy a Postage Stamp	Accuracy of Public Clocks
1	Switzerland	Ireland	Germany	Switzerland
2	Ireland	Netherlands	Switzerland	Italy
3	Germany	Switzerland	Ireland	Austria
4	Japan	England	Japan	Singapore
5	Italy	Germany	Sweden	Romania
6	England	United States	Hong Kong	Japan 1
7	Sweden	Japan	Taiwan	Sweden
8	Austria	France	Austria	Germany
9	Netherlands	Kenya	England	Poland
10	Hong Kong	Italy	Costa Rica	France
11	France	Canada	Singapore	Ireland
12	Poland	Poland	Italy	China
13	Costa Rica	Sweden	Greece	England
14	Taiwan	Hong Kong	Netherlands	Hong Kong
15	Singapore	Greece	Poland	Costa Rica
16	United States	Costa Rica	El Salvador	South Korea
17	Canada	Mexico	Czech Republic	Bulgaria
18	South Korea	Taiwan	France	Hungary
19	Hungary	Hungary	Hungary	Jordan
20	Czech Republic	South Korea	South Korea	United States
21	Greece	Czech Republic	Canada	Taiwan
22	Kenya	El Salvador	Bulgaria	Canada
23	China	Austria	United States	Czech Republic
24	Bulgaria	China	Brazil	Kenya
25	Romania	Singapore	China	Netherlands
26	Jordan	Indonesia	Indonesia	Mexico
27	Syria	Bulgaria	Jordan	Syria
28	El Salvador	Jordan	Syria	Brazil
29	Brazil	Syria	Romania	Greece
30	Indonesia	Romania	Kenya	Indonesia
31	Mexico	Brazil	Mexico	El Salvador

Rank of 31 countries for overall pace of life and for three measures: minutes downtown pedestrians take to walk 60 feet; minutes it takes a postal clerk to complete a stamp purchase transaction; and accuracy in minutes of public clocks.

(**Source:** Based on Levine, 1997a.)

Module 16.3 Review

- People in middle age look at their jobs differently than before, placing more emphasis on short-term factors and less on career striving and ambition. Job satisfaction tends to be high for most middle-aged people, but some are dissatisfied because of disappointment with their accomplishments and for other reasons. Burnout is a factor, especially for people in the helping professions.
- Unemployment in midlife can have negative economic, psychological, and physical effects.
- Midlife career changes are becoming more prevalent, motivated usually by dissatisfaction, the need for more challenge or status, or the desire to return to the workforce after childrearing.
- People in middle adulthood usually have more leisure time than previously. Often they use it to become more involved outside the home in recreational and community activities.

Journal Writing Prompt

Applying Lifespan Development: What are some of the effects of being involuntarily unemployed on middle-aged adults? What cognitive and personality changes might happen as a result of unemployment? Would you expect these to be different in adults who have chosen to retire?

Epilogue

Despite the lingering belief that middle adulthood is a time of stagnation, crisis, and dissatisfaction, we have seen that people continue to grow and change during this period. Physically, they experience gradual declines and become more susceptible to some diseases. Cognitively, middle-aged adults experience both gains in some areas and losses in others, and generally they learn to compensate rather well for any declining capacities.

As for the realm of social and personality development, we witnessed people facing and dealing successfully with a large number of changes in family relationships and work life. We also saw that to characterize this as a time of crisis is to overstate the negative and to ignore the positive aspects of the period, which is usually characterized by satisfaction and successful adjustment. Most typically, people in middle age fill many roles successfully, engaging with others from many periods of the life span, including their children, parents, spouses, friends, and coworkers.

In this chapter, we examined theories of the stages of midlife development and viewed some of the major controversies that emerge from this period of life. We have also considered the status of relationships during middle adulthood, particularly relationships with children, parents, and spouses. We have seen that changes in these areas are especially likely to affect adults at this time of their lives. Finally, we discussed work and leisure time during midlife—a time when career and retirement issues are likely to be uniquely salient.

Before turning to the next chapter, recall the prologue to this one, about Geoff Kelvin whose midlife riches include a job he enjoys, a spouse and son he loves, and an improved relationship with his dad. Using your knowledge of the midlife period, consider these questions.

1. Do you think Geoff's growth in midlife is more reflective of normative-crisis models or life events models of personality development? What factors influenced your answer?
2. How does Geoff's life illustrate Erikson's generativity-versus-stagnation stage of development?
3. Though different, how do Geoff and Juan each exhibit common attitudes about their careers at midlife? Why might Juan find it more satisfying to work from home?
4. Living together as adults drew Geoff and his dad closer than they had ever been. What factors on each side might have contributed to this?

Looking Back

LO 16.1 Describe ways in which personality develops during middle adulthood.

There are differing opinions as to whether people pass through age-related developmental stages in a more or less uniform progression, as normative-crisis models indicate, or respond to a varying series of major life events at different times and in different orders, as life events models suggest.

LO 16.2 Summarize Erikson's view of development during middle adulthood and how others have expanded on his ideas.

Erik Erikson suggests that the developmental conflict of the age is generativity-versus-stagnation, involving a shift in focus from oneself to the world beyond. George Vaillant views the main developmental issue as keeping the meaning versus rigidity, in which people seek to extract meaning from their lives and accept the strengths and weaknesses of others. According to Roger Gould, people move through seven stages during adulthood. Daniel Levinson's theory of the seasons of life focuses on the creation of a global vision of one's future in early adulthood, followed by the midlife

transition of the early 40s, during which people confront their mortality and question their accomplishments, often inducing a midlife crisis. Levinson has been criticized for the methodological limitations of his study, which focused on a small sample of men. The notion of the midlife crisis has been discredited for lack of evidence. Even the concept of a distinct "middle age" appears to be cultural in nature, achieving significance in some cultures and not in others.

LO 16.3 Discuss the nature of continuity in personality development during middle adulthood.

It appears that, in general, the broad personality may be relatively stable over time, with particular aspects changing in response to life changes.

LO 16.4 Describe typical patterns of marriage and divorce in middle adulthood.

Middle adulthood is, for most married couples, a time of satisfaction, but for many couples marital satisfaction declines steadily and divorce results. Most people who divorce remarry, usually to another divorced person. Because of the marriage gradient, women over 40 find it harder to remarry than men. People who marry for a second time tend to be more realistic and mature than people in first marriages, and to share roles and responsibilities more equitably. However, second marriages end in divorce even more often than first marriages.

LO 16.5 Differentiate the changing family situations middle-aged adults face.

The empty nest syndrome, a supposed psychological upheaval following the departure of children, is probably exaggerated. The permanent departure of children is often delayed as "boomerang" children return home for a number of years after having faced the harsh realities of economic life. Adults in the middle years often face responsibilities for their children and for their aging parents. Such adults, who have been called the sandwich generation, face significant challenges.

LO 16.6 Describe how people in middle adulthood react to becoming grandparents.

Many middle-aged adults become grandparents for the first time. Researchers have identified three grandparenting styles: involved, companionate, and remote. Styles tend to differ by gender and race.

LO 16.7 List the causes and characteristics of family violence in the United States.

Family violence in the United States has reached epidemic proportions, with some form of violence occurring in a quarter of all marriages. The likelihood of violence is highest in families that are subject to economic or emotional stresses. In addition, people who were abused as children have a higher likelihood of becoming abusers as adults—a phenomenon termed the "cycle of violence." Marital aggression typically proceeds through three stages: a tension-building stage, an acute battering incident, and a loving contrition stage. Despite contrition, abusers tend to remain abusers unless they get effective help.

LO 16.8 Summarize characteristics of work and career in middle adulthood.

For most persons, midlife is a time of job satisfaction. Career ambition becomes less of a force in the lives of middle-aged workers and outside interests begin to be more valued. Job dissatisfaction can result from disappointment with one's achievements and position in life or from the feeling that one has failed to make a difference in the insurmountable problems of the job. This latter phenomenon, termed burnout, often affects those in the helping professions.

LO 16.9 Describe the effect losing one's job has on a person in middle adulthood.

Some people in middle adulthood must face unexpected unemployment, which brings economic, psychological, and physical consequences.

LO 16.10 Explain how and why people change careers in middle adulthood.

A growing number of people voluntarily change careers in midlife, some to increase job challenge, satisfaction, and status, and others to return to a workforce they left years earlier to rear children.

LO 16.11 Describe how people experience leisure time in middle adulthood.

Middle-aged people have substantial leisure time at their disposal, which many spend in social, recreational, and community activities. Leisure activities in midlife serve as a good preparation for retirement.

Key Terms and Concepts

normative-crisis models 535
life events models 536
generativity-versus-stagnation stage 536
midlife crisis 537
empty nest syndrome 545
boomerang children 546
sandwich generation 546
cycle of violence hypothesis 550
burnout 552

SUMMARY

7 Putting It All Together

Middle Adulthood

LEIGH RYAN, active physically and mentally and unsure about her marriage, is at 50 chronologically and developmentally right in the middle of middle adulthood. She has continued to grow through the first half of middle adulthood, and she has firm plans to keep developing through the second half. She is active and engaged in her hobbies of dance and gardening, and she is pursuing further education in sociology while working full-time and teaching part-time. Socially, she enjoys entertaining her friends and giving back to her community, but she finds that her long marriage is unsatisfying, and she is quietly working to resolve that matter. In midlife she is feeling the pull of family connections in Montreal and may in fact make a move in that direction. Undoubtedly, her development will continue wherever she chooses to live, with or without her husband.

WHAT WOULD YOU DO?

■ Would you advise Leigh to consider lightening her schedule, perhaps by giving up her teaching job or reducing her course load? Why or why not?

What's your response?

WHAT WOULD A MARRIAGE COUNSELOR DO?

■ What factors in her marriage would you advise Leigh to consider as she contemplates divorce, given her age and situation? How can she tell if her marital discontent is a genuine issue to resolve or just a "midlife crisis"?

What's your response?

Physical Development

- Leigh shows few signs of the physical declines of midlife, and she has maintained a high activity level.
- The fact that she is keeping physically fit may help her stave off osteoporosis and other ailments.
- It is possible that Leigh's marital discontent may reflect changes in her or her husband's sexuality.
- Leigh appears to be generally healthy, and her many activities seem to be life-enhancing rather than stress-inducing.

Cognitive Development

- Leigh is pursuing a doctoral degree, which demands intellectual alertness and activity.
- Leigh's love of teaching indicates an active mind and a commitment to using her intelligence.
- It is likely that Leigh has a great deal of practical intelligence in addition to the more traditional kind.
- Her memory shows little sign of decline and allows for new skills to be learned.

Social and Personality Development

- Leigh shares with many people in middle adulthood the experience of raising children and seeing them off to college.
- Her contributions to her community and her family indicate that she is successfully managing Erikson's generativity-versus-stagnation stage.
- Leigh is working on her marital situation, which shows clear signs of a gradual decline rather than a reawakening.
- Leigh faces the prospect of an empty nest, which may have an effect on whether she decides to stay married.

WHAT WOULD A HEALTH CARE PROVIDER DO?

■ How would you check that Leigh's many activities are healthful for her and not potentially stress-inducing and harmful?

What's your response?

WHAT WOULD AN EDUCATIONAL COUNSELOR DO?

■ Would you advise Leigh to consider studying something other than sociology—perhaps something more practical—given her age? Is she too old for a doctorate? Will she be able to keep up with younger students?

What's your response?

Chapter 17

Physical and Cognitive Development in Late Adulthood

Learning Objectives

LO 17.1 Describe what it is like to grow old in the United States today.

LO 17.2 Summarize the physical changes that occur in old age.

LO 17.3 Explain the extent to which people slow down as they age and the consequences of this slowing.

LO 17.4 Describe how the senses are affected by aging.

LO 17.5 Describe the general state of health of older people and to what disorders they are susceptible.

LO 17.6 Summarize how wellness can be maintained in old age.

LO 17.7 Describe how sexuality is affected by aging.

LO 17.8 Identify the factors involved with life span and the causes of death.

LO 17.9 Discuss the possible extension of the life span through scientific advances and its implications.

LO 17.10 Describe how well older adults function cognitively.

LO 17.11 Discuss in what ways memory does and does not decline in late adulthood.

LO 17.12 Describe how learning and education continue in late adulthood.

Chapter Overview

Prologue: To Live Forever

John Benjamin thinks it's a snap to be 74. "Compared to all that hustling to make a career and raise a family, life is much easier now," he says. He admits there have been changes. "I used to run every day, but my knees starting giving me trouble about 10 years ago and I switched to biking. Much easier on the joints." Another change is his sense of smell. "People say 'stop and smell the roses,' but I *can't* smell the roses anymore," he jokes. Still, there's plenty about life John does enjoy. "I was a lawyer for 40 years, and when I retired, I started blogging about Supreme Court decisions. My daughter helped me set up the blog. Now, I'm writing a book on the Supreme Court over the last 50 years." John also plays viola in a string quartet, a group he formed 10 years ago, and he goes swing dancing with his partner, Maddie. "I call her my *girl*friend because though she's got a year on me, she's so young and sassy in her attitude. We went to Paris last spring, and café-hopped on the Left Bank until the wee hours." Asked if he has any other big ambitions besides finishing his book, John considers for a moment. "I guess I just want to live forever. That's my major goal now." ■

Looking Ahead

John Benjamin is not alone when it comes to showing renewed vitality in late adulthood. Increasingly, older people are pioneering new fields, achieving new athletic endeavors, and generally reshaping how we perceive the later stages of life. For a growing number of people in late adulthood, vigorous mental and physical activity remains an important part of daily life.

In this chapter, we will consider both physical and cognitive development during late adulthood. We begin with a discussion of the myths and realities of aging, examining some of the stereotypes that color our understanding of late adulthood. We look at the outward and inward signs of aging and the ways the nervous system and senses change with age.

Next, we consider health and well-being in late adulthood. After examining some of the major disorders that affect older people, we look at what determines wellness and what it is about aging that makes old people susceptible to disease. We also focus on various theories that seek to explain the aging process, as well as on gender, race, and ethnic differences in life expectancy.

Finally, the chapter discusses intellectual development during late adulthood. We look at the nature of intelligence in older people and the various ways cognitive abilities change. We also assess how different types of memory fare during late adulthood, and we consider ways to reverse intellectual declines in older people.

Gerontologists have found that people in late adulthood can be as vigorous and active as those many years younger.

Physical Development in Late Adulthood

Let's start our journey through late adulthood by considering the physical changes that occur.

Aging: Myth and Reality

LO 17.1 Describe what it is like to grow old in the United States today.

Old age used to be equated with loss: loss of brain cells, loss of intellectual capabilities, loss of energy, loss of sex drive. However, as people like John Benjamin show, that view is being steadily displaced as **gerontologists**, specialists who study aging, paint a new picture of late adulthood. Rather than being viewed as a period of decline, late adulthood is now seen as a stage in which people continue to change—to grow in some areas and, yes, to decline in others.

gerontologists
specialists who study aging

Late adulthood holds a unique distinction among the periods of human life: Because people are living longer, late adulthood is actually increasing in length. Whether we peg the start of the period at age 65 or 70, there is today a greater proportion of people alive in late adulthood than at any time in world history.

Because many older adults are as vigorous and involved with life as people several decades younger, we cannot define old age by chronological years alone; we also must take into account people's physical and psychological well-being, their *functional ages*. Some researchers of aging divide people into three groups according to their functional ages: the *young old* are healthy and active; the *old old* have some health problems and difficulties with daily activities; and the *oldest old* are frail and in need of care. Although a person's chronological age can predict which functional group he or she is most likely to fall into, it is not a sure thing. An active, healthy 100-year-old would be considered young old by researchers on aging. In comparison, a 60-year-old in the late stages of emphysema would be considered among the oldest old, according to functional age.

Like researchers of aging, demographers have taken to dividing their measurements of the elderly population by age too. They use the same terms as researchers who refer to functional aging but with different meanings (so be sure to clarify if someone is using one of these terms). For demographers, the *young old* are those 65 to 74 years old. The *old old* are between 75 and 84, and the *oldest old* are people 85 and older.

THE DEMOGRAPHICS OF LATE ADULTHOOD. One out of every eight people in the United States is 65 years of age or older. However, projections suggest that by the year 2050, nearly one-quarter of the population will be age 65 and above. The number of people over the age of 85 is projected to increase from the current 4 million to 18 million by 2050 (see Figure 17-1; Schneider, 1999; Administration on Aging, 2003).

The fastest growing segment of the population is the oldest old—people who are 85 or older. In the last two decades, the size of this group has nearly doubled. The population explosion among older people is not limited to the United States. In fact, the rate of increase is much higher in developing countries. As can be seen in Figure 17-2, the sheer numbers of elderly are increasing substantially in countries around the globe. By 2050, the number of adults worldwide over the age 60 will exceed the number of people under the age of 15 for the first time in history (Sandis, 2000; United Nations, Department of Economic and Social Affairs, Population Division, 2013).

AGEISM: CONFRONTING THE STEREOTYPES OF LATE ADULTHOOD. Crotchety. Old codger. Old coot. Senile. Geezer. Old hag. Such are the labels of late adulthood. If you find that they don't draw a pretty picture, you're right: Such words are demeaning and biased, representing both overt and subtle ageism. **Ageism** is prejudice and discrimination directed at older people.

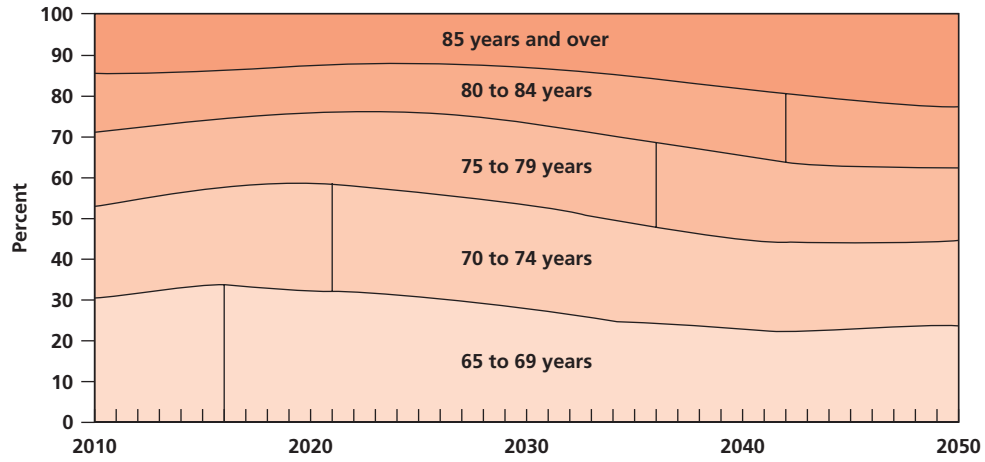
ageism
prejudice and discrimination directed at older people

Ageism is manifested in several ways. It is found in widespread negative attitudes toward older people, suggesting that they are in less than full command of their mental faculties. For example, the results of many attitude studies have found that older adults

Figure 17-1 The Flourishing Elderly

The percentage of people over the age of 65 is projected to rise to almost 25 percent of the population by the year 2050. Can you name two factors that contribute to this increase?

(**Source:** Adapted from U.S. Bureau of the Census, 2008.)



Note: Line indicates the year that each age group is the largest proportion of the older population.

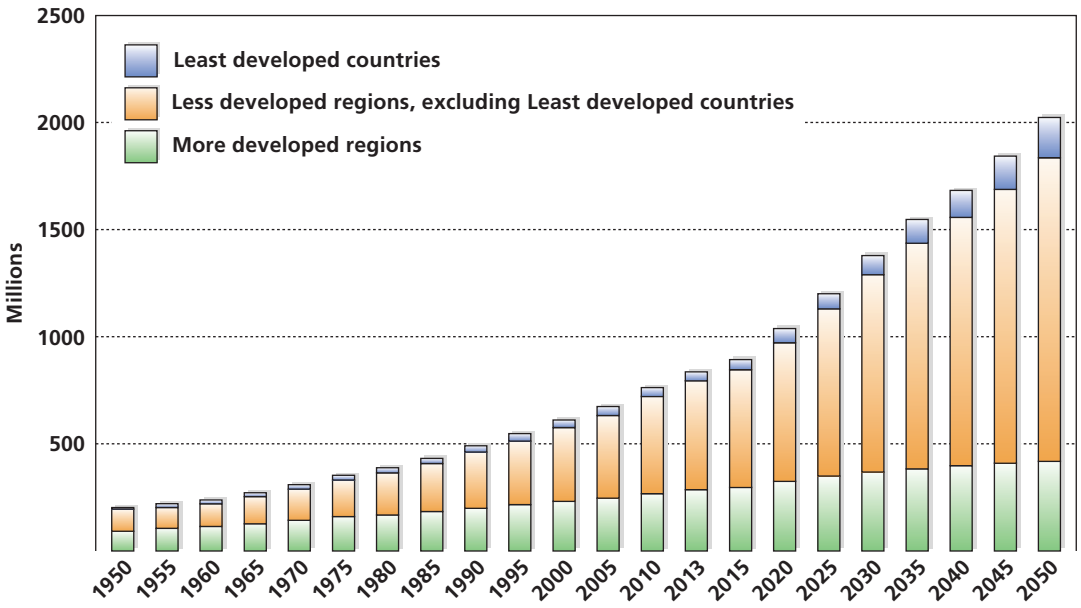
are viewed more negatively than younger ones on a variety of traits, particularly those having to do with general competence and attractiveness (Iversen, Larsen, & Solem, 2009; Woodspring, 2012; Jesmin, 2014).

Furthermore, identical behavior carried out by an older and a younger person often is interpreted quite differently. Imagine you hear someone describing his search for his house keys. How would your perception of the person change if you knew he was 20 or 80? Older adults who show memory lapses are viewed as chronically forgetful and likely to be suffering from some mental disorder. Similar behavior on the part of young adults is judged more charitably, merely as evidence of temporary forgetfulness produced by having too much on their minds (Nelson, 2004; Lassonde et al., 2012).

Figure 17-2 The Elderly Population Worldwide

Longer life is transforming population profiles worldwide, with the proportion of those over the age of 60 predicted to increase substantially by the year 2050.

(**Source:** Based on United Nations, Department of Economic and Social Affairs, Population Division, 2013.)



What do you see when you look at this woman? Ageism is found in widespread negative attitudes toward older people, suggesting that they are in less than full command of their faculties.

This negative view of older people is connected to the reverence of youth and youthful appearance that characterizes many Western societies. It is the rare advertisement that includes an elderly person, unless it is for a product specifically designed for older adults. And when older persons are portrayed in television programming, they are often presented as someone's mother, father, grandmother, or grandfather rather than as individuals in their own right (Vernon, 1990; McVittie, McKinlay, & Widdicombe, 2003).

The ageism that produces such negative views of older people is reflected in the way they are treated. For instance, elderly individuals seeking jobs may face open prejudice, being told in job interviews that they lack the stamina for particular jobs. Or they sometimes are relegated to jobs for which they are overqualified. In addition, such stereotypes are accepted by people in late adulthood, becoming self-fulfilling prophecies that hinder performance (Rupp, Vodanovich, & Credé, 2006; Levy, 2009; Wiener et al., 2014).

The ageism directed toward people in late adulthood is, in some ways, a peculiarly modern and Western cultural phenomenon. In the colonial period of U.S. history, a long life was an indication that a person had been particularly virtuous, and older people were held in high esteem. Similarly, people in most Asian societies venerate those who have reached old age because elders have attained special wisdom as a consequence of living so long. Likewise, many Native American societies traditionally have viewed older people as storehouses of information about the past (Palmore, 1999; Bodner, Bergman, & Cohen-Fridel, 2012; Maxmen, 2012).

Today, however, negative views of older people prevail in U.S. society, and they are based on widespread misinformation. For instance, to test your knowledge about aging, try answering the questions posed in Table 17-1. Most people score no higher than chance on the items, averaging about 50 percent correct (Palmore, 1992). Given the prevalence of ageist stereotypes in Western societies today, it is reasonable to ask how accurate these views are. Is there a kernel of truth in them?

The answer is largely no. Aging produces consequences that vary greatly from one person to the next. Although some elderly people are in fact physically frail, have cognitive difficulties, and require constant care, others are vigorous and independent—and sharp, brilliant, and shrewd thinkers. Furthermore, some problems that at first glance seem attributable to old age are actually a result of illness, improper diet, or insufficient nutrition.

Table 17-1 The Myths of Aging

1. The majority of old people (age 65 and older) have defective memory, are disoriented, or demented. T or F?
2. The five senses (sight, hearing, taste, touch, and smell) all tend to weaken in old age. T or F?
3. The majority of old people have no interest in, nor capacity for, sexual relations. T or F?
4. Lung capacity tends to decline in old age. T or F?
5. The majority of old people are sick most of the time. T or F?
6. Physical strength tends to decline in old age. T or F?
7. At least one-tenth of the aged are living in long-stay institutions (such as nursing homes, mental hospitals, and homes for the aged). T or F?
8. Aged drivers have fewer accidents per driver than those under age 65. T or F?
9. Older workers usually cannot work as effectively as younger workers. T or F?
10. Over three-fourths of the aged are healthy enough to carry out their normal activities. T or F?
11. The majority of old people are unable to adapt to change. T or F?
12. Old people usually take longer to learn something new. T or F?
13. It is almost impossible for the average old person to learn something new. T or F?
14. Older people tend to react more slowly than do younger people. T or F?
15. In general, old people tend to be pretty much alike. T or F?
16. The majority of old people say they are seldom bored. T or F?
17. The majority of old people are socially isolated. T or F?
18. Older workers have fewer accidents than do younger workers. T or F?

Scoring
All odd-numbered statements are false; all even-numbered statements are true. Most college students miss about six, and high school students miss about nine. Even college instructors miss an average of about three.

(**Source:** Adapted from Palmore, 1988; Rowe & Kahn, 1999.)

As we will see, the autumn and winter of life can bring change and growth on a par with—and sometimes even greater than—earlier periods of the life span (Whitbourne, 2007).

From *a social worker's* perspective

When older people win praise and attention for being "vigorous," "active," and "youthful," is this a message that combats or supports ageism?

Physical Transitions in Older People

LO 17.2 Summarize the physical changes that occur in old age.

"Feel the burn." That's what the teacher says, and many of the 14 women in the class are doing just that. As the teacher continues through a variety of exercises, the women participate to varying degrees. Some stretch and reach vigorously, while others just move in time to the beat of the music. It's not much different from thousands of exercise classes all over the United States, yet to the youthful observer there is one surprise: The youngest woman in this class is 66 years old, and the oldest, dressed in a sleek black leotard, is 81.

The surprise registered by this observer reflects a popular stereotype of elderly persons. Many people view those over 65 as sedentary and sedate, an image that certainly does not incorporate involvement in vigorous exercise.

The reality, however, is different. Although the physical capabilities of elderly people are not the same as they were in earlier stages of life, many older persons remain remarkably agile and physically fit in later life (Riebe, Burbank, & Garber, 2002; Sargent-Cox, Anstey, & Luszcz, 2012).

Still, the changes in the body that began subtly during middle adulthood become unmistakable during old age. Both the outward indications of aging and those related to internal functioning become incontestable.

As we discuss aging, it is important to remember the distinction, introduced in Chapters 13 and 15, between primary and secondary aging. **Primary aging**, or *senescence*, involves the universal and irreversible changes that occur as people get older due to genetic programming. It reflects the inevitable changes that all of us experience from the time we are born. In contrast, **secondary aging** encompasses changes that are due to illness, health habits, and other individual differences but that are not due to increased age itself and are not inevitable. Although the physical and cognitive changes that involve secondary aging are more common as people become older, they are potentially avoidable and can sometimes be reversed.

primary aging
aging that involves universal and irreversible changes that, due to genetic programming, occur as people get older

secondary aging
changes in physical and cognitive functioning that are due to illness, health habits, and other individual differences, but which are not due to increased age itself and are not inevitable

osteoporosis
a condition in which the bones become brittle, fragile, and thin, often brought about by a lack of estrogen in the diet

OUTWARD SIGNS OF AGING. One of the most obvious signs of aging is the changes in a person's hair. Most people's hair becomes distinctly gray and eventually white, and it may thin out. The face and other parts of the body become wrinkled as the skin loses elasticity and *collagen*, the protein that forms the basic fibers of body tissue (Bowers & Thomas, 1995; Medina, 1996).

People may become noticeably shorter, with some shrinking as much as 4 inches. Although this shortening is partially due to changes in posture, the primary cause is that the cartilage in the discs of the backbone has become thinner. This is particularly true for women, who are more susceptible than men to **osteoporosis**, or thinning of the bones, largely because of reduced production of estrogen.

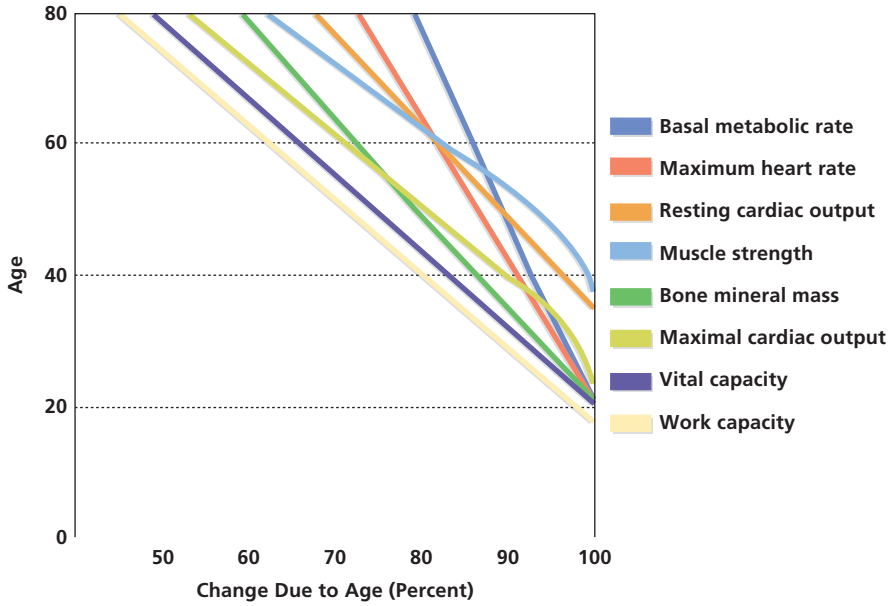
Osteoporosis affects 25 percent of women over the age of 60 and is a primary cause of broken bones among elderly women and men. It is largely preventable if people's calcium and protein intake are sufficient in earlier parts of life and if they have engaged in adequate exercise. In addition, osteoporosis can be treated and even prevented through use of drugs such as Fosamax (alendronate) (Swaim, Barner, & Brown, 2008; Tadic et al., 2012; Hansen et al., 2014).

Although negative stereotypes against appearing old operate for both men and women, they are particularly potent for women. In Western cultures there is a *double standard* for appearance, by which women who show signs of aging are judged more harshly than men. For instance, gray hair in men is often viewed as "distinguished," a

Even in late adulthood, exercise is possible—and beneficial.

Figure 17-3 Changing Physical Capacities

As people age, significant changes occur in the functioning of various systems of the body.
(**Source:** Based on Whitbourne, 2001.)



sign of character; the same characteristic in women is a signal that they are "over the hill" (Sontag, 1979; Bell, 1989).

As a consequence of the double standard, women are considerably more likely than men to feel compelled to hide the signs of aging. For instance, older women are much more likely than men to dye their hair and to have cosmetic surgery, and women's use of cosmetics is designed to make them look younger than their years (Unger & Crawford, 1992). This is changing, however. Men are also becoming more interested in maintaining a youthful appearance, another sign of the dominance of a youth orientation in Western culture. For example, more cosmetic products, such as wrinkle creams, are available for men. This may be interpreted as a sign both that the double standard is easing and that ageism is becoming more of a concern for both sexes.

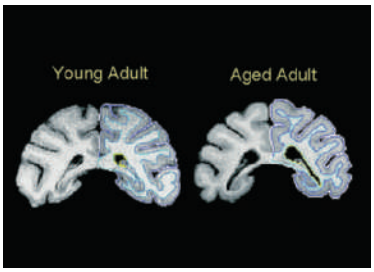
INTERNAL AGING. As the outward physical signs of aging become increasingly apparent, significant changes occur in the internal functioning of the organ systems. The capacities of many functions decline with age (see Figure 17-3; Whitbourne, 2001; Aldwin & Gilmer, 2004).

The brain becomes smaller and lighter with age, although, in the absence of disease, it retains its structure and function. As the brain shrinks, it pulls away from the skull, and the amount of space between brain and skull doubles from age 20 to age 70. Blood flow is reduced within the brain, which also uses less oxygen and glucose. The number of neurons, or brain cells, declines in some parts of the brain, although not as many as was once thought. For instance, recent research suggests that the number of cells in the brain's cortex may drop only minimally or not at all. In fact, some evidence suggests that certain types of neuronal growth may continue throughout the life span (Raz et al., 2007; Gattringer et al., 2012; Jäncke et al., 2015; see Figure 17-4).

The reduced flow of blood in the brain is due in part to the heart's reduced capacity to pump blood throughout the circulatory system. Because of hardening and shrinking of blood vessels throughout the body, the heart is forced to work harder, and it is typically unable to compensate fully. A 75-year-old man pumps less than three-quarters of the blood that he was able to pump during early adulthood (Kart, 1990; Yildiz, 2007).

Figure 17-4 Brain Cell Decline

These MRI images show loss of white, but not gray, matter in the brain of a 32-year-old rhesus monkey (right). The young adult is 5 years old.
(**Source:** Rosene et al., 1996.)



Other bodily systems work at lower capacity than they did earlier in life. For instance, the respiratory system is less efficient with age. The digestive system produces less digestive juice and is less efficient in pushing food through the system—which produces a higher incidence of constipation. Some hormones are produced at lower levels with increasing age. Furthermore, muscle fibers decrease both in size and in amount, and they become less efficient at using oxygen from the bloodstream and storing nutrients (Deruelle et al., 2008; Morley, 2012).

Although all of these changes are part of the normal process of aging, they often occur earlier in people who have less healthy lifestyles. For example, smoking accelerates declines in cardiovascular capacity at any age.

Lifestyle factors can also slow the changes associated with aging. For instance, people whose exercise program includes weightlifting may lose muscle fiber at a slower rate than those who are sedentary. Similarly, physical fitness is related to better performance on mental tests, may prevent a loss of brain tissue, and may even aid in the development of new neurons. An increasing number of studies suggest that sedentary older adults who begin aerobic fitness training ultimately show cognitive benefits (Kramer, Erickson, & Colcombe, 2006; Pereira et al., 2007; Lin et al., 2014).

Slowing Reaction Time

LO 17.3 Explain the extent to which people slow down as they age and the consequences of this slowing.

Karl winced as the "game over" message came up on his grandson's video game system. He enjoyed trying out their games, but he just couldn't shoot down those bad guys as quickly as his grandkids could.

As people get older, they take longer: longer to put on a tie, longer to reach a ringing phone, longer to press the buttons in a video game. One reason for this slowness is a lengthening of reaction time. Reaction time begins to increase in middle age, and by late adulthood the rise can be significant (Fozard et al., 1994; Benjuya, Melzer, & Kaplanski, 2004; Der & Deary, 2006).

It is not clear why people slow down. One explanation, known as the **peripheral slowing hypothesis**, suggests that overall processing speed declines in the peripheral nervous system. According to this notion, the peripheral nervous system, which encompasses the nerves that branch out from the spinal cord and brain and reach the extremities of the body, becomes less efficient with age. Because of this decrease in efficiency, it takes longer for information from the environment to reach the brain and longer for commands from the brain to be transmitted to the body's muscles (Salthouse, 2006).

peripheral slowing hypothesis
the theory suggesting that overall processing speed declines in the peripheral nervous system with increasing age

Other researchers have proposed an alternative explanation. According to the **generalized slowing hypothesis**, processing in all parts of the nervous system, including the brain, is less efficient. As a consequence, slowing occurs throughout the body, including the processing of both simple and complex stimuli and the transmission of commands to the muscles of the body (Cerella, 1990).

generalized slowing hypothesis
the theory that processing in all parts of the nervous system, including the brain, is less efficient

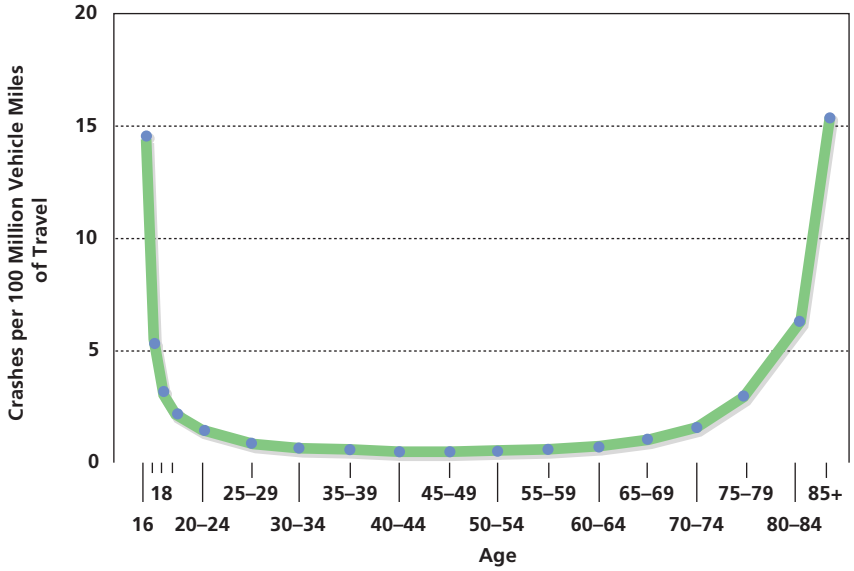
Although we don't know which explanation provides the more accurate account, it is clear that the slowing of reaction time and general processing results in a higher incidence of accidents for elderly persons. Because their reaction and processing time is slowed, they are unable to efficiently receive information from the environment that may indicate a dangerous situation, their decision-making processes may be slower, and ultimately their ability to remove themselves from harm's way is impaired. Drivers over the age of 70 have as many fatal accidents as teenagers when accidents are figured in terms of miles of driving (Whitbourne, Jacobo, & Munoz-Ruiz, 1996; see Figure 17-5).

Although it takes older individuals longer to respond, the *perception* of time seems to increase with age. The days and weeks seem to go by more quickly; generally, time seems to rush by faster for older adults than younger ones. The reason may be due to changes

Figure 17-5 Vehicle Fatalities across the Life Span

Drivers over age 70 have a fatal accident record comparable to that of teenagers when crashes are calculated per mile of driving. Why is this the case?

(**Source:** National Highway Traffic Safety Administration, 1994.)



in the way the brain coordinates its internal time clock (Facchini & Rampazi, 2009; Jones Ross, Cordazzo, & Scialfa, 2014).

The Senses: Sight, Sound, Taste, and Smell

LO 17.4 Describe how the senses are affected by aging.

Old age brings with it distinct declines in the sense organs of the body, although in this area there is a great deal of variation. Sensory declines are of major psychological consequence because the senses serve as people's link with the world outside the mind.

VISION. Age-related changes in the physical apparatus of the eye—the cornea, lens, retina, and optic nerve—lead to a decrease in visual abilities. For instance, the lens becomes considerably less transparent: The amount of light arriving at the retina of a healthy 60-year-old is only a third as much as that of a 20-year-old. The optic nerve becomes less efficient in transmitting nerve impulses (Schieber et al., 1992; Gawande, 2007).

As a result, vision declines along several dimensions. We see distant objects less clearly and need more light to see clearly, and it takes longer to adjust from dark to light places and vice versa.

These changes in vision produce everyday difficulties. Driving, particularly at night, becomes more challenging. Similarly, reading requires more lighting, and eye strain occurs more easily. Eyeglasses and contact lenses can correct many of these problems, however, and the majority of older people can see reasonably well (Owsley, Stalvey, & Phillips, 2003).

Several eye diseases become more common during late adulthood. For instance, *cataracts*—cloudy or opaque areas on the lens of the eye that interfere with passing light—frequently develop. People with cataracts have blurred vision and tend to experience glare in bright light. If cataracts are left untreated, the lens becomes milky white and blindness is the eventual result. However, cataracts can be surgically removed, and eyesight can be restored through the use of eyeglasses, contact lenses, or *intraocular lens implants*, in which a plastic lens is permanently placed in the eye (Walker, Anstey, & Lord, 2006).

Another serious problem that afflicts many elderly individuals is glaucoma. As we noted first in Chapter 15, *glaucoma* occurs when pressure in the fluid of the eye increases, either because the fluid cannot drain properly or because too much fluid is produced.

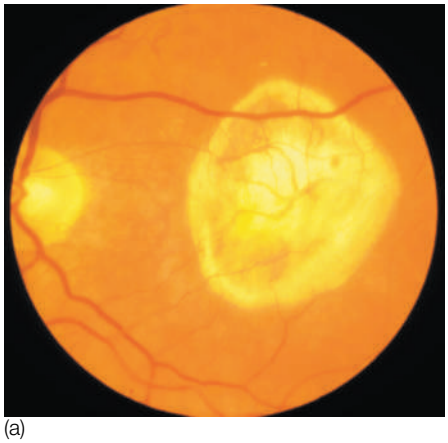
Glaucoma, too, can be treated by drugs or surgery if it is detected early enough.

The most common cause of blindness in people over the age of 60 is *age-related macular degeneration (AMD)*. This disorder affects the *macula*, a yellowish area of the eye located near the retina at which visual perception is most acute. When a portion of the macula thins and degenerates, eyesight gradually deteriorates (see Figure 17-6). If diagnosed early, macular degeneration can sometimes be treated with medication or lasers. In addition, there is some evidence that a diet rich in antioxidant vitamins (C, E, and A) can reduce the risk of the disease (Wiggins & Uwaydat, 2006; Coleman et al., 2008; Jager, Mieler, & Miller, 2008).

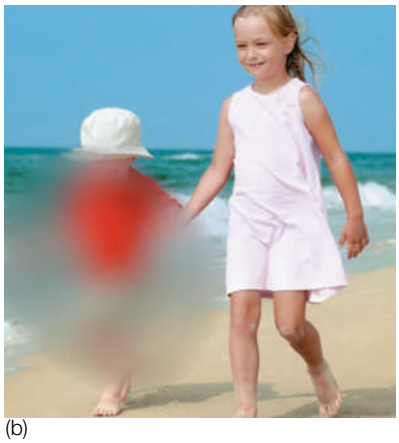
Figure 17-6 The World through Macular Degeneration

(a) Age-related macular degeneration affects the macula, a yellowish area of the eye located near the retina. Eyesight gradually deteriorates once the portion of the macula thins and degenerates. (b) Macular degeneration leads to a gradual deterioration of the center of the retina, leaving only peripheral vision. This is an example of what a person with macular degeneration might see.

(**Source:** AARP, 2005, p. 34.)



(a)



(b)

HEARING. Around 30 percent of adults between the ages of 65 and 74 have some degree of hearing loss, and the figure rises to 50 percent among people over the age of 75. Overall, more than 10 million elderly people in the United States have hearing impairments of one kind or another (Chisolm, Willott, & Lister, 2003; Pacala & Yueh, 2012; Bainbridge & Wallhagen, 2014).

Aging particularly affects a person's ability to hear higher frequencies. Loss of these frequencies makes it hard to hear conversations when there is considerable background noise or when several people are speaking simultaneously. Furthermore, some elderly persons actually find loud noises painful.

Although hearing aids can help compensate for these losses and would probably be helpful in around 75 percent of the cases of permanent hearing loss, only 20 percent of elderly people wear them. One reason is that hearing aids are far from perfect. They amplify background noises as much as they amplify conversations, making it difficult for wearers to separate what they want to hear from other sounds. An elderly person trying to follow a conversation in a restaurant may be jolted by the sound of a fork clattering onto a plate. Many elderly people feel that the use of hearing aids makes them appear even older than they really are and encourages others to treat them as if their minds were disabled (Lesner, 2003; Meister & von Wedel, 2003).

Hearing loss can be especially damaging to the social lives of older people. Unable to hear conversations fully, some elderly people with hearing problems withdraw from others, avoiding situations in which many people are present. They may also be unwilling to respond to others, since they are unsure of what was said to them. Hearing loss can lead to feelings of paranoia as the person fills in the blanks according to his or her mental fears rather than reality. For example, someone may say "I *hate* going to the mall," and the impaired listener may decide that they have said, "I hate going to Maude's." Because they are able to catch only fragments of conversations, a hearing-impaired older adult can easily feel left out and lonely (Myers, 2000; Goorabi, Hoseinabadi, & Share, 2008; Mikkola et al., 2014).

Furthermore, hearing loss may hasten cognitive declines in the elderly. As they struggle to understand what is being said, older people who have hearing problems may use considerable mental resources simply to try to perceive what is being said—mental resources that might otherwise be processing the information being conveyed. The result can be difficulties in remembering and understanding information (Wingfield, Tun, & McCoy, 2005).

TASTE AND SMELL. Elderly people who have enjoyed eating throughout their lives may experience a real decline in the quality of life because of changes in sensitivity to taste and smell. Both senses become less discriminating in old age, causing food to taste and smell less appetizing than it did earlier (Kaneda et al., 2000; Nordin, Razani, & Markison, 2003; Murphy, 2008).

The reason for the decrease in taste and smell sensitivity can be traced to physical changes. Most older people have fewer taste buds in the tongue than they did when they were younger. Furthermore, the olfactory bulbs in the brain begin to shrivel, which reduces the ability to smell. Because smell is responsible in part for taste, the shrinkage of the olfactory bulbs makes food taste even blander.

The loss of taste and smell sensitivity has an unfortunate side effect: Because food does not taste as good, people eat less and open the door to malnutrition. They may also over-salt their food to compensate for the loss of taste buds, thereby increasing their chances of developing *hypertension*, or high blood pressure, one of the most common health problems of old age (Smith et al., 2006).

Module 17.1 Review

- Because many older adults are as vigorous and involved with life as people several decades younger, we cannot define old age by chronological years alone; we also must take into account people's physical and psychological well-being, their *functional ages*. Yet despite many older people being vigorous, older people are often the victims of ageism—prejudice and discrimination against old people.
- Old age brings both external changes (thinning and graying hair, wrinkles, and shorter stature) and internal changes (decreased brain size, reduced blood flow within the brain, and diminished efficiency in circulation, respiration, and digestion).
- The two main hypotheses to explain the increase in reaction time in old age are the peripheral slowing hypothesis and the generalized slowing hypothesis.
- Vision may become more difficult at distances, in dim light, and when moving from darkness to light and vice versa. Hearing, especially of high frequencies, may diminish, causing social and psychological difficulties, and taste and smell may become less discriminating, leading to nutritional problems.

Journal Writing Prompt

Applying Lifespan Development: Should strict examinations for renewal of driver's licenses be imposed on older people? What issues should be taken into consideration?

Health and Wellness in Late Adulthood

Sandra Frye passes around a photo of her father. "He was 75 when this was taken. He looks great and he could still sail back then, but he was already forgetting things like what he'd done yesterday or what he'd eaten for breakfast."

Frye takes part in a support group for family members of Alzheimer's patients. The second picture she shares shows her father 10 years later. "It was sad. He'd start talking to me and his words would jumble. Then he'd forget who I was. He forgot he had a younger brother or that he'd been a pilot in World War II. A year after this photo, he was bedridden. Six months later, he died."

When Sandra Frye's father was diagnosed with Alzheimer's, he joined the 4.5 million Americans who suffer from this debilitating condition, a disease that saps both the physical and mental powers of its victims. In some ways, Alzheimer's disease symbolizes our view of elderly people, who, according to popular stereotypes, are more apt to be ill than healthy.

However, the reality is different: Most elderly people are in relatively good health for most of old age. According to surveys conducted in the United States, almost three-quarters of people 65 years old and above rate their health as good, very good, or excellent (USDHHS, 1990; Kahn & Rowe, 1999).

On the other hand, to be old is to be susceptible to a host of diseases. We now consider some of the major physical and psychological problems that beset older people.

Health Problems in Older People: Physical and Psychological Disorders

LO 17.5 Describe the general state of health of older people and to what disorders they are susceptible.

Most of the illnesses and diseases found in late adulthood are not peculiar to old age; people of all ages suffer from cancer and heart disease, for instance. However, the incidence of these and many other diseases rises with age, increasing the odds that an elderly person will be ill during the period. Moreover, while younger people can readily rebound from a variety of health problems, older persons bounce back more slowly from illnesses. And ultimately, the illness may get the best of an older person, preventing a full recovery.

COMMON PHYSICAL DISORDERS. The leading causes of death in elderly people are heart disease, cancer, and stroke. Close to three-quarters of people in late adulthood die from these problems. Because aging is associated with a weakening of the body's immune system, older adults are also more susceptible to infectious diseases (Feinberg, 2000).

WATCH THIS VIDEO ON MYPSYCHLAB LATE ADULTHOOD: HEALTH, SANDRA

In addition to their risk of fatal diseases and conditions, most older people have at least one chronic, long-term condition. For instance, *arthritis*, an inflammation of one or more joints, afflicts roughly half of older people. Arthritis can cause painful swelling in various parts of the body, and it can be disabling. Sufferers can find themselves unable to carry out the simplest of everyday activities, such as unscrewing the cap of a jar of food or turning a key in a lock. Although aspirin and other drugs can relieve some of the swelling and reduce the pain, the condition cannot be cured (Sun, Wu, & Kalunian, 2007).

Around one-third of older people have *hypertension*, or high blood pressure. Many people who have high blood pressure are unaware of their condition because it does not have any symptoms, which makes it more dangerous. Over time, higher tension within the circulatory system can result in deterioration of the blood vessels and heart, and can raise the risk of cerebrovascular disease, or stroke, if it is not treated (Wiggins & Uwaydat, 2006). (For more on risk factors in late adulthood, see the *From Research to Practice* box.)

PSYCHOLOGICAL AND MENTAL DISORDERS. Some 15 to 25 percent of those over age 65 are thought to show some symptoms of psychological disorder, although this represents a lower prevalence rate than in younger adults. The behavioral symptoms related to

Arthritis can produce swelling and inflammation in the joints of the hands.

From Research to Practice

Falling Is a Risk and a Fear for Older Adults

Falling is a serious health risk for older adults. It is the leading cause of both fatal and nonfatal injuries among this age group. Many thousands of older adults in the United States die each year from head and brain trauma and other fall-related injuries. Even those who survive a fall with little or no injury may become so fearful of a repeat incident that they limit their mobility and activity, resulting in reduced quality of life and an ironic increased likelihood of falling again due to the fitness loss associated with becoming more sedentary (Vellas et al., 1997; Sterling, O'Connor, & Bonadies, 2001; Crews & Campbell, 2004).

New research investigates how vision-impaired older adults think about their own risk of falling, and four major themes for explaining falls emerged from participants' responses to the researchers' interview questions:

- **Health and balance issues**: Respondents described a variety of specific health-related issues that they connected with falling, such as dizziness, circulation problems, nerve damage, and the physical side effects of medications.
- **Cognitive and behavioral factors**: Respondents described momentarily forgetting about their limitations and responding to events such as a ringing doorbell as they did when they were younger. They also cited risk-taking, such as using chairs to reach high places even though they knew better (Brundle et al., 2015).
- **Sight impairment (unseen hazards)**: The problem was not so much objects in the way as covert hazards. For instance, respondents described tripping on rugs, flooring transitions, and overhanging bedding, for example, as well as slipping on spills that they couldn't see and having difficulty telling when they reached the top or bottom of a flight of stairs.
- **Difficulty navigating environments outside the home**: Uneven pavement, leaves, litter, curbs and steps, and sloping ground were all cited as hazards of concern.

Although these hazards were previously shown to be common causes of falls, this research provided important context about how older adults perceive these risks and cope with them. An important finding in this regard was the frequency with which older adults believed that the risk of falling was outside their control. But medications can be adjusted, carelessness can be remedied, and safety features such as handrails and intercoms can be deployed in the home to lessen the risk of falling considerably (Brundle et al., 2015).

Shared Writing Prompt

What might be some simple interventions that could help an older adult become more mobile with less fear of falling?

these disorders are sometimes different in those over 65 from those displayed by younger adults (Haight, 1991; Whitbourne, 2001).

One of the more prevalent problems is major depression, which is characterized by feelings of intense sadness, pessimism, and hopelessness. One obvious reason older people may become depressed is because they suffer cumulative losses with the death of spouses and friends. Their own declining health and physical capabilities, which may make them feel less independent and in control, may contribute to the prevalence of depression (Menzel, 2008; Vink et al., 2009; Taylor, 2014).

These explanations make sense, but it is not yet entirely clear that depression is a significantly worse problem in late adulthood than it is earlier in life. Some studies suggest that the rate of depression actually may be lower during late adulthood. One reason for this contradictory finding is that there may be two kinds of depression in older adulthood: depression that continues from earlier stages of life and depression that occurs as a result of aging (Gatz, 1997).

WATCH THIS VIDEO ON MYPSYCHLAB

SPEAKING OUT: ALVIN: DEMENTIA

It is not unusual for some elderly people to suffer from drug-induced psychological disorders brought about by combinations of drugs they may be taking for various medical conditions. Because of changes in metabolism, a dose of a particular drug that would be appropriate for a 25-year-old might be much too high for a person of 75. The effects of drug interactions can be subtle, and they can manifest themselves in a variety of psychological symptoms, such as drug intoxication or anxiety. Because of these possibilities, older people who take medications must be careful to inform their physicians and pharmacists of every drug they take. They should also avoid medicating themselves with over-the-counter drugs because a combination of nonprescription and prescription drugs may be dangerous or even deadly.

The most common mental disorder of elderly people is **dementia**, a broad category of serious memory loss accompanied by declines in other mental functioning, which encompasses a number of diseases. Although dementia has many causes, the symptoms are similar: declining memory, lessened intellectual abilities, and impaired judgment. The chances of experiencing dementia increase with age. Less than 2 percent of people between 60 and 65 years are diagnosed with dementia, but the percentages double for every five-year period past 65. Consequently, almost one-third of people over the age of 85 suffer from some sort of dementia. There are some ethnic differences, too, with African Americans and Hispanics showing higher levels of dementia than Caucasians (Alzheimer's Association, 2012).

dementia
the most common mental disorder of the elderly, it covers several diseases, each of which includes serious memory loss accompanied by declines in other mental functioning

The most common form of dementia is Alzheimer's disease. Alzheimer's represents one of the most serious mental health problems faced by the aging population.

ALZHEIMER'S DISEASE. **Alzheimer's disease**, a progressive brain disorder that produces loss of memory and confusion, leads to the deaths of 100,000 people in the United States each year. Nineteen percent of people age 75 to 84 have Alzheimer's, and nearly half of people over the age of 85 are affected by the disease. Unless a cure is found, some 14 million people will be victims of Alzheimer's by 2050—more than three times the current number (Park et al., 2014).

Alzheimer's disease
a progressive brain disorder that produces loss of memory and confusion

The symptoms of Alzheimer's disease develop gradually. Generally, the first sign is unusual forgetfulness. A person may stop at a grocery store several times during the week, forgetting that he or she has already done the shopping. People may also have trouble recalling particular words during conversations. At first, recent memories are affected, and then older memories fade. Eventually, people with the disease are totally confused, unable to speak intelligibly or to recognize even their closest family and friends. In the final stages of the disease, they lose voluntary control of their muscles and are bedridden. Because victims of the disorder are initially aware that their memories are failing and often understand quite well the future course of the disease, they may suffer from anxiety, fear, and depression—emotions not difficult to understand, given the grim prognosis.

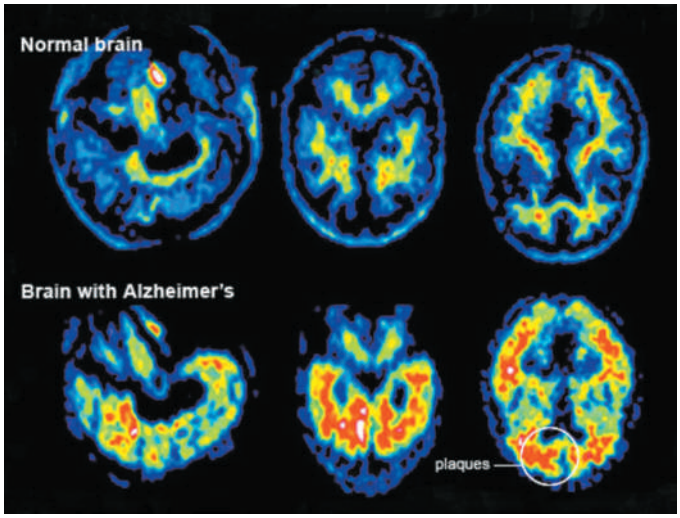
Biologically, Alzheimer's occurs when production of the protein *beta amyloid precursor protein*—a protein that normally helps the production and growth of neurons—goes awry, producing large clumps of cells that trigger inflammation and deterioration of nerve cells. The brain shrinks, and several areas of the hippocampus and frontal and temporal lobes show deterioration. Furthermore, certain neurons die, which leads to a shortage of various neurotransmitters, such as acetylcholine (Wolfe, 2006; Medeiros et al., 2007; Bredesen, 2009).

Although the physical changes in the brain that produce the symptoms of Alzheimer's are clear, what is not known is what triggers the problem in the first place. Several explanations have been advanced. For instance, as we saw in Chapter 2, genetics clearly plays a role, with some families showing a much higher incidence of Alzheimer's than others. In certain families, half the children appear to inherit the disease from their parents. Furthermore, years before the actual symptoms of Alzheimer's emerge, people who are genetically at high risk for the disease show differences in brain functioning (see Figure 17-7) (Coon et al., 2007; Thomas & Fenech, 2007; Baulac et al., 2009).

Most evidence suggests that Alzheimer's is an inherited disorder, but nongenetic factors, such as high blood pressure or diet may increase susceptibility to the disease. In one cross-cultural study, poor black residents in a Nigerian town were less likely to develop Alzheimer's than a comparable sample of African Americans living in the United States. The researchers speculate that variations in diet between the two groups—the residents of Nigeria ate mainly vegetables—might account for the differences in the Alzheimer's rates (Lahiri et al., 2007; Fuso et al., 2012; Roussotte et al., 2014).

Figure 17-7 A Different Brain?

Brain scans show differences between the brains of those with Alzheimer's disease and those who do not suffer from it. (Source: Booheimer et al., 2000.)



Other explanations for the disease have also been investigated. For example, scientists are studying certain kinds of viruses, dysfunctions of the immune system, and hormone imbalances that may produce the disease. Other studies have found that lower levels of linguistic ability in the early 20s are associated with declines in cognitive capabilities due to Alzheimer's much later in life (Alisky, 2007; Carbone et al., 2014).

At the present time, there is no cure for Alzheimer's disease; treatment deals only with the symptoms. While understanding of the causes of Alzheimer's is incomplete, several drug treatments for Alzheimer's appear promising, although none is effective in the long term. The most promising drugs are related to the loss of the neurotransmitter acetylcholine (Ach) that occurs in some forms of Alzheimer's disease. Donepezil (Aricept) and Rivastigmine (Exelon) are among the most common drugs prescribed, and they alleviate some of the symptoms of the disease. Still, they are effective in only half of Alzheimer's patients, and only temporarily (Gauthier & Scheltens, 2009).

Other drugs being studied include anti-inflammatory drugs, which may reduce the brain inflammation that occurs in Alzheimer's. In addition, the chemicals in vitamins C and E are being tested, since some evidence suggests that people who take such vitamins are at lower risk for developing the disorder. Still, at this point, it is clear that no drug treatment is truly effective (Alzheimer's Association, 2004; Mohajeri & Leuba, 2009; Sabbagh, 2009)

As victims lose the ability to feed and clothe themselves, or even to control bladder and bowel functions, they must be cared for 24 hours a day. Because such care is typically impossible for even the most dedicated families, most Alzheimer's victims end their lives in nursing homes. Patients with Alzheimer's make up some two-thirds of those in nursing homes (Prigerson, 2003).

People who care for the victims of Alzheimer's often become secondary victims of the disease. It is easy to become frustrated, angry, and exhausted by the demands of Alzheimer's patients, whose needs may be overpowering. In addition to the physical chore of providing total care, caregivers face the loss of a loved one, who not only is visibly deteriorating but can also act emotionally unstable and even fly into rages. The burdens of caring for a person with Alzheimer's can be overwhelming (Ott, Sanders, & Kelber, 2007; Sanders et al., 2008; Iavarone et al., 2014). (Also see the *Are You an Informed Consumer of Development?* feature.)

Are You an Informed Consumer of Development?

Caring for People with Alzheimer's Disease

Alzheimer's disease is one of the most difficult illnesses to deal with, as a friend or loved one progressively deteriorates both mentally and physically. However, several steps can be taken to help both patient and caregiver deal with Alzheimer's:

- Make patients feel secure in their home environments by keeping them occupied in everyday tasks of living as long as possible.
- Provide labels for everyday objects, furnish calendars and detailed but simple lists, and give oral reminders of time and place.
- Keep clothing simple: Provide clothes with few zippers and buttons, and lay them out in the order in which they should be put on.
- Put bathing on a schedule. People with Alzheimer's may be afraid of falling and of hot water, and may therefore avoid needed bathing.
- Prevent people with the disease from driving. Although patients often want to continue driving, their accident rate is high—some 20 times higher than average.
- Monitor the use of the telephone. Alzheimer patients who answer the phone have been victimized by agreeing to requests of telephone salespeople and investment counselors.
- Provide opportunities for exercise, such as a daily walk. This prevents muscle deterioration and stiffness.
- Caregivers should remember to take time off. Although caring for an Alzheimer's patient can be a full-time chore, caregivers need to lead their own lives. Seek out support from community service organizations.
- Call or write the Alzheimer's Association, which can provide support and information. The Association can be reached at 225 N. Michigan Ave. FL. 17, Chicago, IL 60601-7633; Tel. 1-800-272-3900; http://www.alz.org.

Wellness in Late Adulthood: The Relationship between Aging and Illness

LO 17.6 Summarize how wellness can be maintained in old age.

Is getting sick an inevitable part of old age? Not necessarily. Whether an older person is ill or well depends less on age than on a variety of factors, including genetic predisposition, past and present environmental factors, and psychological factors.

Certain diseases, such as cancer and heart disease, have a clear genetic component. Some families have a higher incidence of breast cancer, for instance, than others. At the same time, though, a genetic predisposition does not automatically mean that a person will get a particular illness. People's lifestyles—whether or not they smoke, the nature of their diets, their exposure to cancer-causing agents, such as sunlight or asbestos—may raise or lower their chances of coming down with such a disease.

Furthermore, economic well-being also plays a role. For instance, as at all stages of life, living in poverty restricts access to medical care. Even relatively well-off people may have difficulties finding affordable health care. For example, the average 65-year-old couple retiring in 2013 is estimated to need $220,000 to pay for medical costs through their retirement. Furthermore, older people spend almost 13 percent of their total expenditures on health care, more than two times what younger individuals spend (Administration on Aging, 2003; Wilde et al., 2014).

Finally, psychological factors play an important role in determining people's susceptibility to illness—and ultimately the likelihood of death. For example, having a sense of control over one's environment, even in terms of making choices involving everyday matters, leads to a better psychological state and superior health outcomes (Taylor, 1991; Levy et al., 2002).

PROMOTING GOOD HEALTH. People can do specific things to enhance their physical well-being—as well as their longevity—during old age. It is probably no surprise that the right things to do are no different from what people should do during the rest of the life span: Eat a proper diet, exercise, and avoid obvious threats to health, such as smoking (see Figure 17-8). Medical and social services providers who work with elderly people have begun to emphasize the importance of these lifestyle choices for older adults. The goal of many such professionals has become not just to keep older adults from illness and death, but to extend people's *active life spans*, the amount of time they remain healthy and able to enjoy their lives (Sawatzky & Naimark, 2002; Gavin & Myers, 2003; Katz & Marshall, 2003).

Sometimes, however, older people experience difficulties that prevent them from following even these simple guidelines. For instance, varying estimates suggest that between 15 and 50 percent of elderly people do not have adequate nutrition, and several million experience hunger every day (deCastro, 2002; Donini, Savina, & Cannella, 2003; Strohl, Bednar, & Longley, 2012).

The reasons for such malnutrition and hunger are varied. Some elderly people are too poor to purchase adequate food, and some are too frail to shop or cook for themselves. Others feel little motivation to prepare and eat proper meals, particularly if they live alone or are depressed. For those who have experienced significant declines in taste and smell sensitivity, eating well-prepared food may no longer be enjoyable. And some older people may never have eaten well-balanced meals in earlier periods of their lives (Wolfe, Olson, & Kendall, 1998).

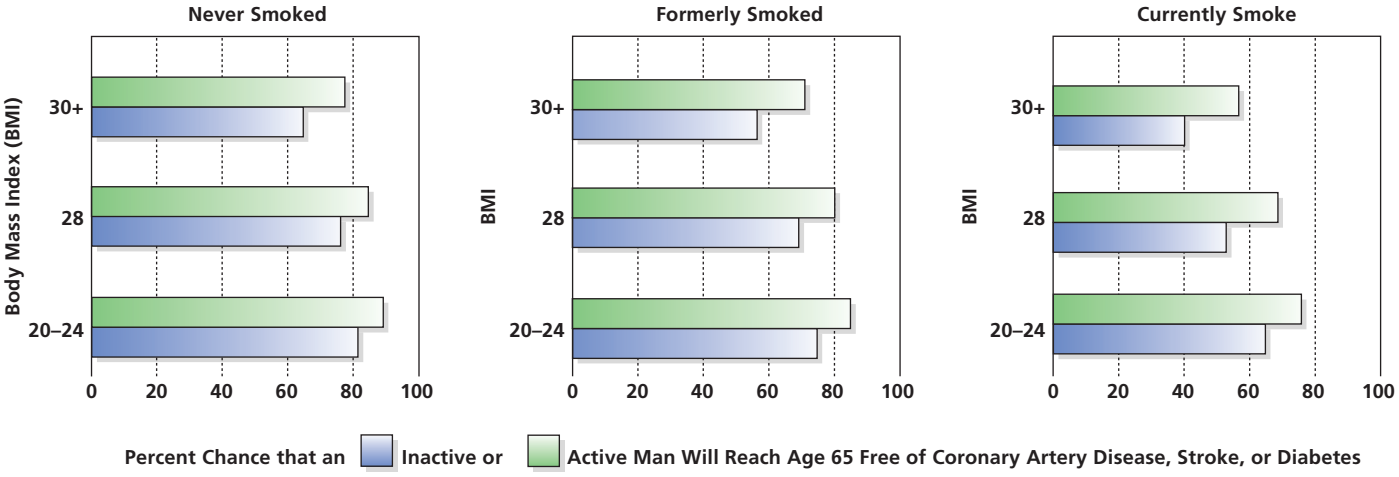
Obtaining sufficient exercise may also prove problematic for older persons. Physical activity increases muscle strength and flexibility, reduces blood pressure and the risk of heart attack, and

Economic well-being and diet are important factors in the relationship between aging and illness.

Figure 17-8 Benefits of Exercise and a Healthy Diet

A study of more than 7,000 men, aged 40 to 59, found that not smoking, keeping weight down, and exercising regularly can greatly reduce the risk of coronary heart disease, stroke, and diabetes. Although the study included only men, a healthy lifestyle can benefit women too. (To find your body mass index [BMI], multiply your weight in pounds by 705. Divide the result by your height in inches, then divide by your height again.)

(**Source:** Based on Wannamethee et al., 1998.)



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produces several other benefits, but many older people do not get sufficient exercise to experience any of these benefits (Hardy & Grogan, 2009; Kamijo et al., 2009; Kelley et al., 2009).

For instance, illness may prevent older adults from exercising, and even inclement weather during the winter may restrict a person's ability to get out of the house. Furthermore, problems can combine: A poor person with insufficient money to eat properly may as a consequence have little energy to put into physical activity (Traywick & Schoenberg, 2008; Logsdon et al., 2009).

Sexuality in Old Age: Use It or Lose It

LO 17.7 Describe how sexuality is affected by aging.

Do your grandparents have sex? Quite possibly, yes. Although the answer may surprise you, increasing evidence suggests that people are sexually active well into their 80s and 90s. This happens in spite of societal stereotypes suggesting that it is somehow improper for two 75-year-olds to have sexual intercourse, and even worse for a 75-year-old to masturbate. Such negative attitudes are a function of societal expectations in the United States. In many other cultures, elderly people are expected to remain sexually active, and in some societies, people are expected to become less inhibited as they age (Hillman, 2000; Lindau et al., 2007).

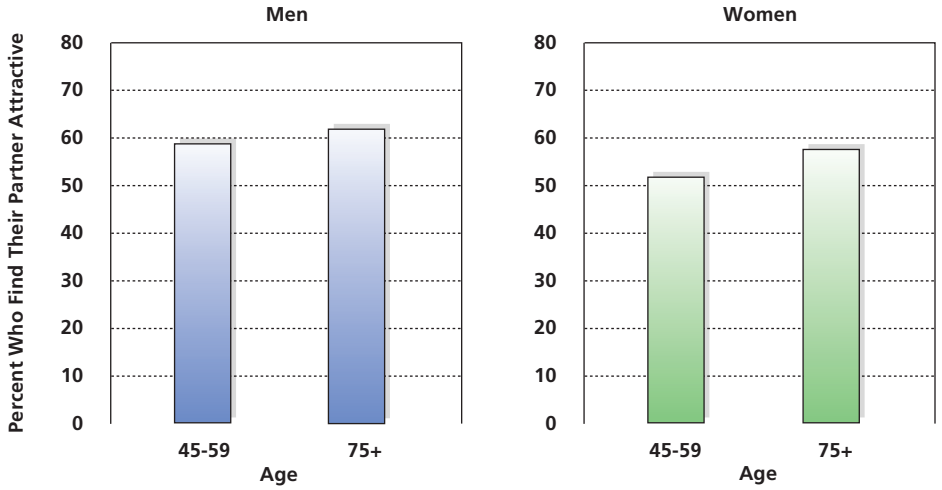
Two major factors determine whether an elderly person will engage in sexual activity. One is good physical and mental health. People need to be physically healthy and to hold generally positive attitudes about sexual activity in order for sex to take place. The other determinant of sexual activity during old age is previous regular sexual activity. The longer elderly men and women have gone without sexual activity, the less likely is future sexual activity. "Use it or lose it" seems an accurate description of sexual functioning in older people. Sexual activity can and often does continue throughout the life span. Furthermore, there's some intriguing evidence that having sex may have some unexpected side benefits: One study found that having sex regularly is associated with a lower risk of death (Henry & McNab, 2003; Huang et al., 2009; Hillman, 2012; McCarthy & Pierpaoli, 2015)!

Masturbation is the most common sexual practice in late adulthood. One survey found that 43 percent of men and 33 percent of women over the age of 70 masturbated. The average frequency for those who masturbated was once per week. Around two-thirds

Figure 17-9 Attractiveness over Time

More than 50 percent of Americans over age 45 find their partners attractive, and as time goes on, more attractive.

(**Source:** AARP/Modern Maturity Sexuality Study, 1999.)



of married men and women had sex with their spouses, again averaging around once per week. In addition, the percentage of people who view their sexual partners as physically attractive actually increases with age (see Figure 17-9; Budd, 1999; Herbenick et al., 2010).

Of course, there are some changes in sexual functioning related to age. Testosterone, the male hormone, declines during adulthood, with some research finding a decrease of approximately 30 to 40 percent from the late 40s to the early 70s. It takes a longer time, and more stimulation, for men to get a full erection, and many men routinely take drugs such as Viagra to achieve and maintain erections. The refractory period—the time following an orgasm during which men are unable to become aroused again—may last as long as a day or even several days. Women's vaginas become thin and inelastic, and they produce less natural lubrication, making intercourse more difficult.

Even in the elderly, sex must be approached responsibly. Older adults—like younger ones—are susceptible to sexually transmitted diseases. In fact, the rate of new cases of other sexually transmitted infections is among the highest for any age group (Seidman, 2003; National Institute of Aging, 2004).

Approaches to Aging: Why Is Death Inevitable?

LO 17.8 Identify the factors involved with life span and the causes of death.

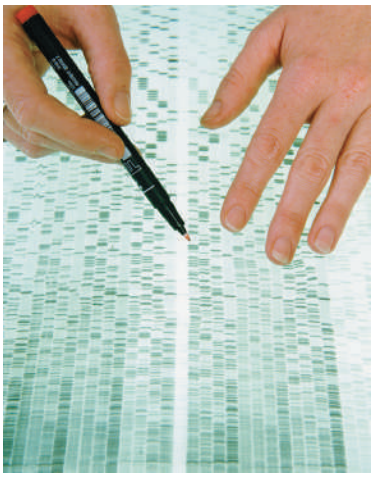
Hovering over our discussion of health in late adulthood is the specter of death. At some point, no matter how healthy we have been throughout life, we know that we will experience physical declines and that life will end. But why?

There are two major approaches to explaining why we undergo physical deterioration and death: genetic programming theories and wear-and-tear theories.

GENETIC PROGRAMMING THEORIES OF AGING. **Genetic programming theories of aging** suggest that our body's DNA genetic code contains a built-in time limit for the reproduction of human cells. After a certain amount of time has gone by—determined genetically—the cells are no longer able to divide, and the individual begins to deteriorate (Rattan, Kristensen, & Clark, 2006).

genetic programming theories of aging
theories that suggest that our body's DNA genetic code contains a built-in time limit for the reproduction of human cells

There are actually several variations of the genetic programming approach. One is that the genetic material contains a "death gene" that is programmed to direct the body to deteriorate and die. Researchers who take an evolutionary viewpoint, described first in Chapter 1, suggest that survival of the species would require that people live long enough to reproduce. A long life span after the reproductive years, however, would be unnecessary. According to this view, genetically related diseases that tend to strike later



According to genetic preprogramming theories of aging, our DNA genetic code contains a built-in limit on the length of life.

in life would continue to exist because they allow people time to have children, thus passing along genes that are "programmed" to cause diseases and death.

A variation of the genetic programming view is that the cells of the body can only duplicate a certain number of times. Throughout our lives, new cells are being made, through cell duplication, to repair and replenish all of our various tissues and organs. According to this view, however, the genetic instructions for running the body can be read only a certain number of times before they become illegible. (Think of a computer disk containing a program that is used over and over and eventually just gives out.) As these instructions become incomprehensible, cells stop reproducing. Because the body is not being renewed at the same rate, people begin to experience bodily deterioration and ultimately death (Hayflick, 2007; Thoms, Kuschel, & Emmert, 2007).

Evidence for the genetic programming theory comes from research showing that when human cells are permitted to divide in the laboratory, they can do so successfully only around 50 times. Each time they divide, *telomeres*, which are tiny, protective areas of DNA at the tip of chromosomes, grow shorter. When a cell's telomere has just about disappeared, the cell stops replicating, making it susceptible to damage and producing signs of aging (Chung et al., 2007; Epel, 2009).

WEAR-AND-TEAR THEORIES OF AGING. The other general set of theories to explain aging and physical decline are **wear-and-tear theories of aging**, which argue that the mechanical functions of the body simply wear out—the way cars and washing machines do. In addition, some wear-and-tear theorists suggest that the body's constant manufacture of energy to fuel its activities creates by-products. These by-products, combined with the toxins and threats of everyday life (such as radiation, chemical exposure, accidents, and disease), eventually reach such high levels that they impair the body's normal functioning. The ultimate result is deterioration and death.

wear-and-tear theories of aging
theories that the mechanical functions of the body simply wear out with age

One specific category of by-products that has been related to aging includes free radicals, electrically charged molecules or atoms that are produced by the cells of the body. Because of their electrical charge, free radicals may cause negative effects on other cells of the body. A great deal of research suggests that oxygen free radicals may be implicated in a number of age-related problems, including cancer, heart disease, and diabetes (Sierra, 2006; Hayflick, 2007; Sonnen et al., 2009).

RECONCILING THE THEORIES OF AGING. Genetic programming theories and wear-and-tear theories make different suggestions about the inevitability of death. Genetic programming theories suggest that there is a built-in time limit to life—it's programmed in the genes, after all. On the other hand, wear-and-tear theories, particularly those that focus on the toxins that are built up during the course of life, paint a somewhat more optimistic view. They suggest that if a means can be found to eliminate the toxins produced by the body and by exposure to the environment, aging might well be slowed. For example, certain genes seem to slow aging and increase people's ability to withstand age-related diseases (Ghazi, Henis-Korenblit, & Kenyon, 2009; Aldwin & Igarashi, 2015).

We don't know which class of theories provides the more accurate account of the reasons for aging. Each is supported by some research, and each seems to explain certain aspects of aging. Ultimately, then, just why the body begins to deteriorate and die remains something of a mystery (Horiuchi, Finch, & Mesle, 2003).

LIFE EXPECTANCY: HOW LONG HAVE I GOT? Although the reasons for deterioration and death are not fully apparent, conclusions about average life expectancy can be stated quite clearly: Most of us can expect to live into old age. The **life expectancy**—the average age of death for members of a population—of a person born in 2010, for instance, is 78 years of age.

life expectancy
the average age of death for members of a population

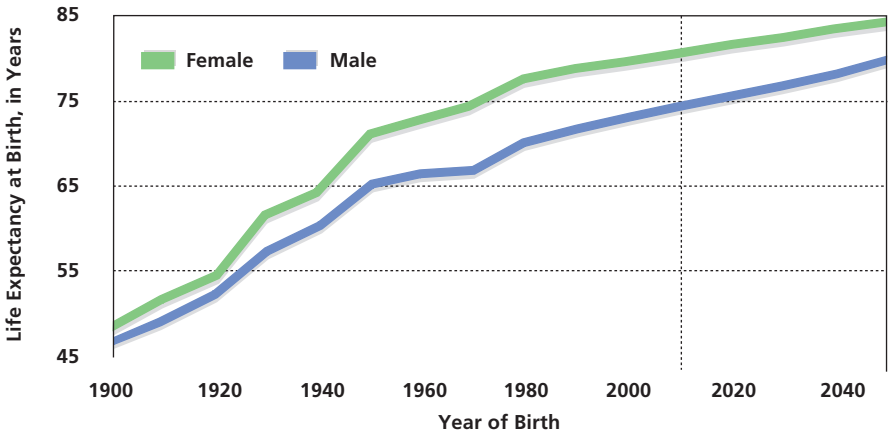
Average life expectancy has been steadily increasing. In 1776, average life expectancy in the United States was just 35. By the early 1900s, it had risen to 47. And in only four decades, from 1950 to 1990, it increased from 68 to over 75 years. Predictions are that it will continue to rise steadily, possibly reaching age 80 by the year 2050 (see Figure 17-10).

There are several reasons for the steady increase in life expectancy over the past 200 years. Health and sanitation conditions are generally better, with many diseases, such as smallpox,

Figure 17-10 Living to Age 100

If increases in life expectancy continue, it may be a common occurrence for people to live to be 100 by the end of this century. What implications does this have for society?

(**Source:** U.S. Bureau of the Census, 1997.)



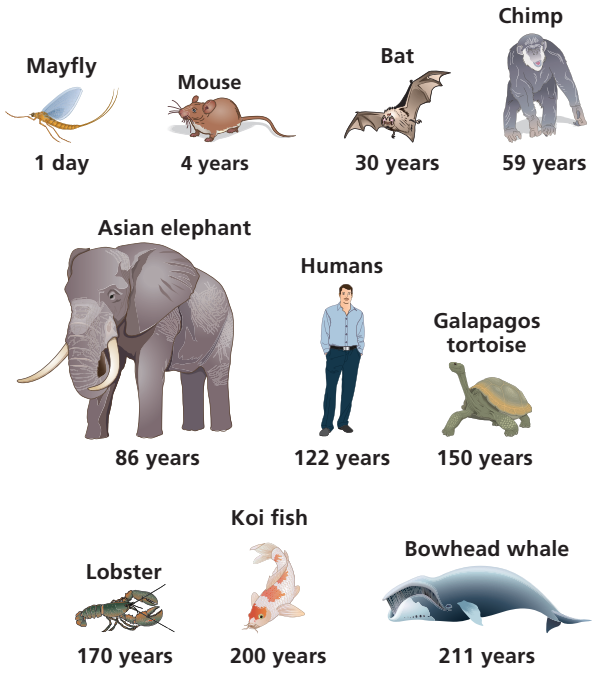
wiped out entirely. Other diseases that used to kill people at early ages, such as measles and mumps, are now better controlled through vaccines and preventive measures. People's working conditions are generally better, and many products are safer than they once were. As we've seen, many people are becoming aware of lifestyle choices, such as keeping their weight down, eating lots of fresh fruit and vegetables, and exercising, which can extend their lives. As environmental factors continue to improve, we can predict that life expectancy will continue to increase. Also, as we've seen, many people are becoming aware of the importance of lifestyle choices for extending not just the length of their lives, but their active life spans, the years they spend in health and enjoyment of life.

One major question for gerontologists is just how far the life span can be increased. The most common answer is that the upper limit of life hovers around 120 years, the age reached by Jeanne Calment, who was the oldest person in the world until she died in 1997 at the age of 122. Living beyond this age would probably require some major genetic alterations in humans, because every species seems to have biological constraints that keep them from growing old beyond a particular life span (see Figure 17-11). Still, as we consider next, several scientific and technological advances that have occurred in the last decade suggest that significantly extending the life span is not an impossibility (Kirkwood, 2010).

Figure 17-11 Animal Life Spans

Maximum recorded life spans for animals found in the wild.

(**Source:** Based on Kirkwood, 2010).



Postponing Aging: Can Scientists Find the Fountain of Youth?

LO 17.9 **Discuss the possible extension of the life span through scientific advances and its implications.**

Are researchers close to finding the scientific equivalent of the mythical fountain of youth that can postpone aging?

They haven't found it yet, but they're getting closer, at least in nonhuman species. Researchers have made significant strides in the last decade in identifying potential ways that aging may be held off. For instance, studies involving nematodes—microscopic, transparent worms that typically live for just nine days—have found that it is possible to extend their lives to 50 days, which is the equivalent of having a human live to the age of 420 years. Fruit flies' lives have also been extended, doubling their life expectancy (Whitbourne, 2001; Libert et al., 2007; Ocorr et al., 2007).

According to new findings in several areas, there is no single mechanism that is likely to postpone aging. Instead, it is probable that a combination of some of the following most promising avenues for increasing the length of life will prove effective:

- *Telomere therapy.* As noted earlier, telomeres are the tiny areas at the tip of chromosomes that grow shorter each time a cell divides and eventually disappear, ending cell replication. Some scientists believe that if telomeres could be lengthened, age-related problems could be slowed. Researchers are now attempting to find genes that control the natural production of telomerase, an enzyme that seems to regulate the length of telomeres (Steinert, Shay, & Wright, 2000; Urquidi, Tarin, & Goodison, 2000; Chung et al., 2007).
- *Drug therapy.* Scientists in 2009 discovered that the drug *rapamycin* could extend life in mice by 14 percent by interfering with the activity of a protein *mTOR* (Blagosklonny et al., 2010; Stipp, 2012; Zhang et al., 2014).
- *Unlocking longevity genes.* Certain genes control the body's ability to overcome environmental challenges, making it better able to overcome physical adversity. If those genes can be harnessed, they may provide a way of increasing the life span. One particularly promising family of genes is *sirtuins*, which may regulate and promote longer life (Guarente, 2006; Sinclair & Guarente, 2006; Glatt et al., 2007).
- *Reducing free radicals through antioxidant drugs.* As mentioned earlier, free radicals are unstable molecules that are a by-product of normal cell functioning that may drift through the body, damaging other cells and leading to aging. Although antioxidant drugs designed to reduce the number of free radicals have not yet been proven effective, some scientists think that they may eventually be perfected. Furthermore, some speculate it may be possible to insert in human cells genes that produce enzymes that act as antioxidants. In the meantime, nutritionists urge a diet rich in antioxidant vitamins, which are found in fruits and vegetables (Kedziora-Kornatowska et al., 2007; Haleem et al., 2008; Kolling & Knopf, 2014).
- *Restricting calories.* For at least the last decade, researchers have known that laboratory rats who are fed an extremely low-calorie diet, one that provides 30 to 50 percent of their normal intake, often live 30 percent longer than better-fed rats, provided that they obtain all the vitamins and minerals that they require. The reason appears to be that fewer free radicals are produced in the hungry rats. Researchers hope to develop drugs that mimic the effects of calorie restriction without forcing people to feel hungry all the time (Mattson, 2003; Ingram, Young, & Mattison, 2007; Cuervo, 2008).
- *The bionic solution: replacing worn-out organs.* Heart transplants—liver transplants—lung transplants: We live in an age where the removal of damaged or diseased organs and their replacement with better-functioning ones seems nearly routine.

However, despite significant advances in organ transplantation, transplants frequently fail because the body rejects the foreign tissue. To overcome this problem, some researchers suggest that replacement organs can be grown from a recipient's cloned cells, thereby solving the rejection problem. In an even more radical advance, genetically engineered cells from nonhumans that do not evoke rejection could be cloned, harvested, and transplanted into people who require transplants. Finally, it is possible that technical advances permitting the development of artificial organs that can completely replace diseased or damaged ones will become common (Cascalho, Ogle, & Platt, 2006; Kwant et al., 2007; Li & Zhu, 2007).

From *a health-care professional's* perspective

Given what you've learned about explanations of life expectancy, what might you do to try to extend your own life?

Unfortunately, all these possibilities for the extension of the human life span remain unproven. Furthermore, a more immediate problem to solve is the reduction in the significant disparities in life expectancies between members of different racial and ethnic groups, as discussed in the following *Developmental Diversity* segment. These differences have important implications for society at large.

Developmental Diversity and Your Life

Gender, Race, and Ethnic Differences in Average Life Expectancy: Separate Lives, Separate Deaths

- The average white child born in the United States is likely to live 78 years. The average African American child is likely to live 5.5 years less.
- A child born in Japan has a life expectancy of more than 83 years; for a child born in Mozambique, life expectancy is less than 40 years.
- A male born in the United States today is most likely to live to the age of 76; a female will probably live some 5 years longer.

The racial and ethnic differences are troubling. They point out the disparities in socioeconomic well-being of various groups in the United States, illustrated in Figure 17-12.

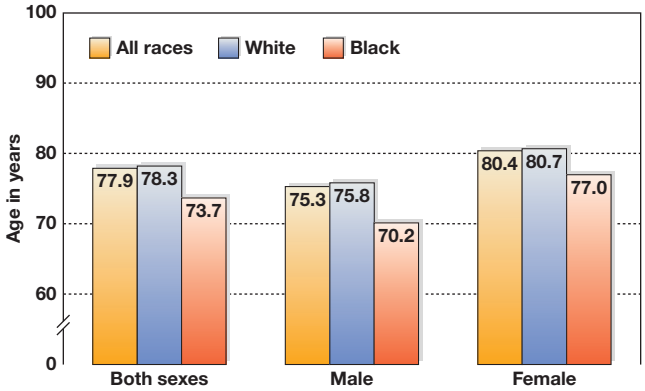
There are several reasons for these discrepancies. Consider, for example, the gender gap in life expectancy, which is particularly pronounced. Across the industrialized world, women live longer than men by some 4 to 10 years. This female advantage begins just after conception: Although slightly more males are conceived, males are more likely to die during the prenatal period, infancy, and childhood.

A child born in Japan has a life expectancy of 83 years. In countries like Gambia, people have an average life expectancy of 45.

Figure 17-12 Life Expectancy of African Americans and Whites

Both male and female African Americans have a shorter life expectancy than male and female Caucasians. Are the reasons for this genetic, cultural, or both?

(**Source:** Kochanek, Arias, & Anderson, 2013.)



Consequently, by the age of 30 there are roughly equal numbers of men and women. But by the age of 65, 84 percent of females and only 70 percent of males are still alive. For those over 85, the gender gap widens: For every male, 2.57 women are still alive (United Nations World Population Prospects, 2006; World Factbook, 2012).

There are several explanations for the gender gap. One is that the naturally higher levels of the hormones estrogen and progesterone in women provide some protection from diseases, such as heart attacks. It is also possible that women engage in healthier behavior during their lives, such as eating well. However, no conclusive evidence supports any of these explanations fully (DiGiovanna, 1994; Emslie & Hunt, 2008).

Whatever its cause, the gender gap has continued to increase. During the early part of the twentieth century, there was only a two-year difference in favor of women, but in the 1980s this gap grew to seven years. The size of the gap now seems to have leveled off, largely because men are more likely than previously to engage in positive health behaviors (such as smoking less, eating better, and exercising more).

Module 17.2 Review

- Although most older people are healthy, the incidence of some serious diseases rises in old age, and most people have at least one chronic ailment before they die. Older people are susceptible to psychological disorders, such as depression. The most prevalent and damaging brain disorder among older people is Alzheimer's disease.
- Proper diet, exercise, and avoidance of health risks can lead to prolonged wellness during old age.
- Sexuality can continue throughout the life span in healthy adults. People who enjoy sex before old age are most likely to continue doing so as they age further.
- Whether death is caused by genetic programming or by general physical wear and tear is an unresolved question. Life expectancy, which has risen for centuries, varies with gender, race, and ethnicity.
- New approaches to increasing life expectancy include telomere therapy, reducing free radicals through antioxidant drugs, restricting caloric intake, and replacing worn-out organs.

Journal Writing Prompt

Applying Lifespan Development: In what ways is socioeconomic status related to wellness in old age and to life expectancy?

Cognitive Development in Late Adulthood

> *Three women were talking about the inconveniences of growing old.*
>
> *"Sometimes," one of them confessed, "when I go to my refrigerator, I can't remember if I'm putting something in or taking something out."*
>
> *"Oh, that's nothing," said the second woman. "There are times when I find myself at the foot of the stairs wondering if I'm going up or if I've just come down."*
>
> *"Well, my goodness!" exclaimed the third woman. "I'm certainly glad I don't have any problems like that"—and she knocked on wood. "Oh," she said, starting up out of her chair, "there's someone at the door." (Dent, 1984, p. 38)*

This old joke summons up the stereotypic view of aging. In fact, not too long ago many gerontologists would have subscribed to the view that older people are befuddled and forgetful.

Today, however, the view has changed dramatically. Researchers no longer see the cognitive abilities of older people as inevitably declining. Overall intellectual ability and specific cognitive skills, such as memory and problem solving, are more likely to remain strong. With the appropriate practice and exposure to certain kinds of environmental stimuli, cognitive skills can actually improve.

Intelligence in Older People

LO 17.10 Describe how well older adults function cognitively.

The notion that older people become less cognitively adept initially arose from misinterpretations of research evidence. As we first noted in Chapter 15, early research on how intelligence changed as a result of aging typically drew a simple comparison between younger and older people's performance on the same IQ test, using traditional cross-sectional experimental methods. For example, a group of 30-year-olds and a group of 70-year-olds might have been given the same test and had their performance compared.

Such a procedure, however, presents several drawbacks, as we noted in Chapter 1. One is that cross-sectional methods do not take into account *cohort effects*—influences attributable to growing up in a particular era. For example, if the younger group—because of when they grew up—has more education, on average, than the older group, we might expect the younger group to do better on the test for that reason alone. Furthermore, because some traditional intelligence tests include timed portions or reaction-time components, the slower reaction time of older people might account for their inferior performance.

To try to overcome such problems, developmental psychologists turned to longitudinal studies, which followed the same individuals for many years. However, because of

repeated exposure to the same test, subjects may, over time, become familiar with the test items. Furthermore, participants in longitudinal studies may move away, stop participating, become ill, or die, leaving a smaller and possibly more cognitively skilled group of people. In short, longitudinal studies have their drawbacks, and their use initially led to some erroneous conclusions about older people.

RECENT FINDINGS ABOUT INTELLIGENCE IN OLDER PEOPLE. More recent research has attempted to overcome the drawbacks of both cross-sectional and longitudinal methods. In what is probably the most ambitious—and still ongoing—study of intelligence in older people, developmental psychologist K. Warner Schaie has employed sequential methods. As we discussed in Chapter 1, *sequential studies* combine cross-sectional and longitudinal methods by examining several different age groups at a number of points in time.

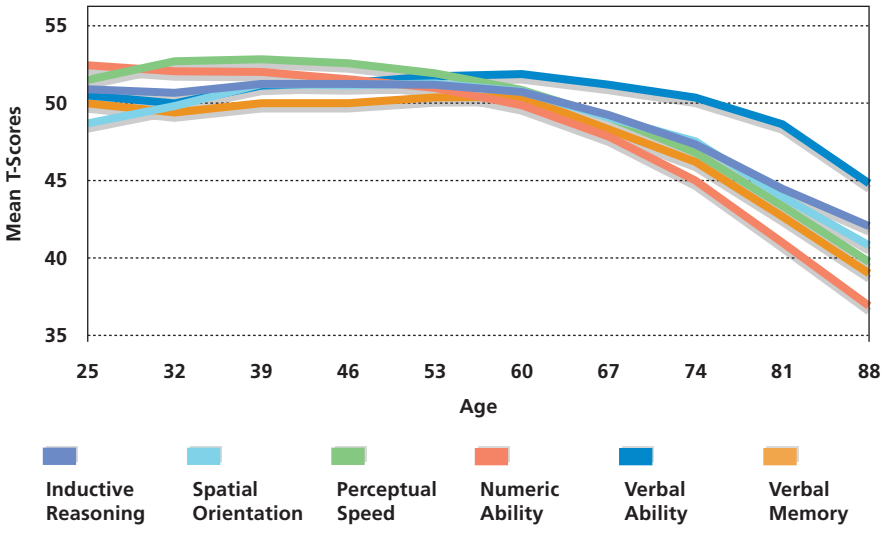
In Schaie's massive study, a battery of tests of cognitive ability was given to a group of 500 randomly chosen individuals. The people belonged to different age groups, starting at age 20 and extending at five-year intervals to age 70. The participants were tested, and continue to be tested, every seven years, and more people are recruited to participate every year. At this point, more than 5,000 participants have been tested (Schaie, 1994).

The study, along with other research, supports several generalizations about the nature of intellectual change during old age. Among the major changes are the following (Schaie, 1994; Craik & Salthouse, 1999; Salthouse, 2006):

- Some abilities gradually decline throughout adulthood, starting at around age 25, while others stay relatively steady (see Figure 17-13). There is no uniform pattern in adulthood of age-related changes across all intellectual abilities. In addition, as we discussed in Chapter 15, fluid intelligence (the ability to deal with new problems and situations) declines with age, while crystallized intelligence (the store of information, skills, and strategies that people have acquired) remains steady and in some cases actually improves (Baltes & Schaie, 1974; Schaie, 1993; Deary, 2014).
- For the average person, some cognitive declines are found in all abilities by age 67. However, these declines are minimal until the 80s. Even at age 81, less than half of the people tested showed consistent declines over the previous seven years.
- Significant individual differences are found in the patterns of change in intelligence. Some people begin to show intellectual declines in their 30s, whereas others do not

Figure 17-13 Changes in Intellectual Functioning

Although some intellectual abilities decline across adulthood, others stay relatively steady.
(**Source:** Schaie, 1994, p. 307.)



experience any decreases until they are in their 70s. In fact, around a third of those in their 70s score higher than the average young adult.

- Environmental and cultural factors play a role in intellectual decline. People with an absence of chronic disease, higher socioeconomic status (SES), involvement in an intellectually stimulating environment, a flexible personality style, marriage to a bright spouse, maintenance of good perceptual processing speed, and feelings of self-satisfaction with one's accomplishments in midlife or early old age showed less decline.

The relationship between environmental factors and intellectual skills suggests that with the proper stimulation, practice, and motivation, older people can maintain their mental abilities. Such **plasticity** in cognitive skills illustrates that there is nothing fixed about the changes that occur in intellectual abilities during late adulthood. In mental life, as in so many other areas of human development, the motto "use it or lose it" is quite fitting. Based on this principle, some developmentalists have sought to develop interventions to help older adults maintain their information processing skills.

plasticity
the degree to which a developing structure or behavior is susceptible to experience

For example, a relatively small investment of time and effort can pay big dividends in intellectual functioning among older adults. In one study, researchers examined the long-term, real-world benefits of cognitive training in older adults. Participants received 10 cognitive training sessions lasting about an hour each, with each successive session becoming increasingly challenging. Three groups of participants received memory training (such as mnemonic strategies for memorizing word lists), reasoning training (such as finding the pattern in a series of numbers), or processing speed training (such as identifying objects that flashed briefly on a computer screen). Some participants also received "booster" training one year later and again three years later, each time consisting of four more sessions (Willis et al., 2006).

Remarkably, cognitive benefits were evident five years after the original training sessions. Compared to a control group that received no training, participants who received reasoning training performed 40 percent better on reasoning tasks at the five-year mark, those who received memory training performed 75 percent better on memory tasks, and those who received speed training performed a staggering 300 percent better on speed tasks (Vedantam, 2006; Willis et al., 2006)!

It is important to note that not all developmentalists believe the "use it or lose it" hypothesis. For example, developmental psychologist Timothy Salthouse suggests that the rate of true, underlying cognitive decline in late adulthood is unaffected by mental exercise. Instead, he argues that some people—the kind who have consistently engaged throughout their lives in high levels of mental activity, such as completing crossword puzzles—enter late adulthood with a "cognitive reserve." This cognitive reserve allows them to continue to perform at relatively high mental levels, even though underlying declines are actually happening. His hypothesis is controversial, though, and most developmentalists accept the hypothesis that mental exercise is beneficial (Hertzog et al., 2008; Salthouse, 2006, 2012a, 2012b).

Memory: Remembrance of Things Past—and Present

LO 17.11 Discuss in what ways memory does and does not decline in late adulthood.

Composer Aaron Copland summed up what had happened to his memory in old age by remarking, "I have no trouble remembering everything that had happened 40 or 50 years ago—dates, places, faces, music. But I'm going to be 90 my next birthday, November 14th, and I find I can't remember what happened yesterday" (Time, 1980, p. 57). Our confidence in the accuracy of Copland's analysis is strengthened by an error in his statement: On his next birthday, he would be only 80 years old!

Is memory loss an inevitable part of aging? Not necessarily. For instance, cross-cultural research reveals that in societies where older people are held in relatively high esteem,

such as in China, people are less likely to show memory losses than in societies where they are held in less regard. In such cultures, the more positive expectations regarding aging may lead people to think more positively about their own capabilities (Levy & Langer, 1994; Hess, Auman, & Colcombe, 2003).

From *a health-care professional's* perspective

How might cultural factors, such as the esteem in which a society holds its older members, work to affect an older person's memory performance?

Memory loss is not as common among Chinese elderly as it is in the West. What are some factors that contribute to cultural differences in memory loss of the elderly?

Even when the declines in memory that can be directly traced to aging do occur, they are limited primarily to *episodic memories*, which relate to specific life experiences, such as recalling the year you first visited New York City. In contrast, other types of memory, such as *semantic memories* (general knowledge and facts, such as the fact that 2 + 2 = 4 or the name of the capital of North Dakota) and *implicit memories* (memories about which people are not consciously aware, such as how to ride a bike), are largely unaffected by age (Dixon, 2003; Nilsson, 2003).

Memory capacities do change during old age. For instance, *short-term memory* slips gradually during adulthood until age 70, when the decline becomes more pronounced. The largest drop is for information that is presented quickly and verbally, such as when someone staffing a computer helpline rattles off a series of complicated steps for fixing a problem with a computer. In addition, information about things that are completely unfamiliar is more difficult to recall. For example, declines occur in memory for prose passages, names and faces of people, and even such critical information as the directions on a medicine label, possibly because new information is not registered and processed as effectively when it is initially encountered. Although these age-related changes are generally minor, and their impact on everyday life negligible (because most elderly people automatically learn to compensate for them), memory losses are real (Carroll, 2000; Light, 2000; Carmichael et al., 2012).

AUTOBIOGRAPHICAL MEMORY: RECALLING THE DAYS OF OUR LIVES. When it comes to **autobiographical memory**, memories of information about one's own life, older people are subject to some of the same principles of recall as younger individuals. For instance, memory recall frequently follows the *Pollyanna principle*, in which pleasant memories are more likely to be recalled than unpleasant memories. Similarly, people tend to forget information about their past that is not congruent with the way they currently see themselves. They are more likely to make the material that they do recall "fit" their current conception of themselves, like a strict parent who forgets that she got drunk at her high school prom (Rubin & Greenberg, 2003; Skowronski, Walker, & Betz, 2003; Loftus, 2003).

autobiographical memory
memories of information about one's own life

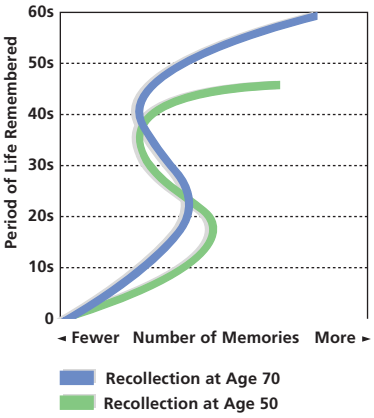
Everyone tends to recall particular periods of life better than others. As can be seen in Figure 17-14, 70-year-olds tend to recall autobiographical details from their 20s and 30s best. In contrast, 50-year-olds are likely to have more memories of their teenage years and their 20s. In both cases, recall of earlier years is better than recall of somewhat more recent decades but not as complete as recall of very recent events (Rubin, 2000).

People in late adulthood also use information that they recall in different ways from younger individuals when they make decisions. For example, they process information more slowly and may make poorer judgments when complex rules are

Figure 17-14 Remembrances of Things Past

Recall of autobiographical memories varies with age, with 70-year-olds recalling details from their 20s and 30s best, and 50-year-olds recalling memories from their teenage years and 20s. People of both ages also recall more recent memories best of all.

(**Source:** Rubin, 1986.)



involved, and they focus more on emotional content than younger people. On the other hand, the accumulated knowledge and experience of people in late adulthood can compensate for their deficits, particularly if they are highly motivated to make good decisions (Peters et al., 2007).

EXPLAINING MEMORY CHANGES IN OLD AGE. Explanations for apparent changes in memory among older people tend to focus on three main categories: environmental factors, information processing deficits, and biological factors.

- ***Environmental factors.*** Certain short-term factors that cause declines in memory may be found more frequently in older people. For example, older people are more apt than younger ones to take the kinds of prescription drugs that hinder memory. The lower performance of older people on memory tasks may be related to drug taking and not to age per se.

  Similarly, declines in memory can sometimes be traced to life changes in late adulthood. For instance, retirees, no longer facing intellectual challenges from their jobs, may become less practiced in using memory. Also, their motivation to recall information may be lower than previously, accounting for lower performance on tasks involving memory. They may also be less motivated than younger people to do their best in testing situations in experiments.

- ***Information processing deficits.*** Memory declines may also be linked to changes in information processing capabilities. For example, as we reach later adulthood, our ability to inhibit irrelevant information and thoughts may decrease, and these irrelevant thoughts interfere with successful problem solving. Similarly, the speed of information processing may decline, perhaps in a similar way to the slowing of reaction times that we discussed earlier, leading to the memory impairments observed in old age (Palfai, Halperin, & Hoyer, 2003; Salthouse, Atkinson, & Berish, 2003; Ising et al., 2014).

  Another information processing view suggests that older adults concentrate on new material less effectively than younger individuals and have greater difficulty paying attention to appropriate stimuli and organizing material in memory. This information processing deficit approach, which has received the most research support, suggests that memory declines are due to changes in the ability to pay attention to and organize tasks involving memory skills. According to this view, older people also use less efficient processes to retrieve information from memory. These information processing deficits subsequently lead to declines in recall abilities (Castel & Craik, 2003; Luo & Craik, 2008, 2009).

- ***Biological factors.*** The last of the major approaches to explaining changes in memory during late adulthood concentrates on biological factors. According to this view, memory changes are a result of brain and body deterioration.

  For instance, declines in episodic memory may be related to the deterioration of the frontal lobes of the brain or a reduction in estrogen. Some studies also show a loss of cells in the hippocampus, which is critical to memory. However, specific sorts of memory deficits occur in many older people without any evidence of underlying biological deterioration (Eberling et al., 2004; Lye et al., 2004; Stevens et al., 2008).

Never Too Late

LO 17.12 Describe how learning and education continue in late adulthood.

Martha Tilden and Jim Hertz, both 71, loved the Metropolitan Opera House tour, the talk by the famous tenor, the ballet, and the lectures they attended during the "Lincoln Center Festival" trip they are just finishing.

Martha and Jim are veterans of Road Scholar (formerly Elderhostel), which has scrapped any suggestion of "elderness" or cheap student housing. All the educational programs they have taken have featured comfortable hotel or dorm rooms and mixed-age

events. Now Martha and Jim are discussing their next program, trying to decide between a wildlife trip to Ontario and a "Building Bridges to Islam" program in Virginia.

More than 100,000 people enroll annually in thousands of classes organized by the Road Scholar program, the largest educational program for people in late adulthood. Represented on college campuses across the world, the Road Scholar movement is among the increasing evidence that intellectual growth and change continue to be important throughout people's lives, including late adulthood. As we saw in our examination of research on cognitive training, exercising specific cognitive skills may be especially important to older adults who want to maintain their intellectual functioning (Simson, Wilson, & Harlow-Rosentraub, 2006).

The popularity of programs such as Road Scholar is part of a growing trend among older people. Because the majority of older people have retired, they have time to pursue further education and delve into subjects in which they have always been interested.

Although not everyone is able to afford tuitions charged by Road Scholar, many public colleges provide free tuition to those 65 and older. In addition, some retirement communities are located at or near college campuses, such as those constructed by the University of Michigan and Penn State University (Powell, 2004; Forbes, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB

SUCCESSFUL AGING, INDEPENDENT LIFESTYLE: THELMA, 81 YEARS OLD

Although some elderly people are doubtful about their intellectual capabilities and consequently avoid regular college classes in which they compete with younger students, their concern is largely misplaced. Older adults often have no trouble maintaining their standing in rigorous college classes. Furthermore, professors and other students generally find the presence of older people, with their varied and substantial life experiences, a real educational benefit (Simpson, Simon, & Wilson, 2001; Simson, Wilson, & Harlow-Rosentaub, 2006).

TECHNOLOGY AND LEARNING IN LATE ADULTHOOD. One of the biggest generational divides involves the use of technology. People 65 and older are less likely to use technology than younger individuals (see Figure 17-15).

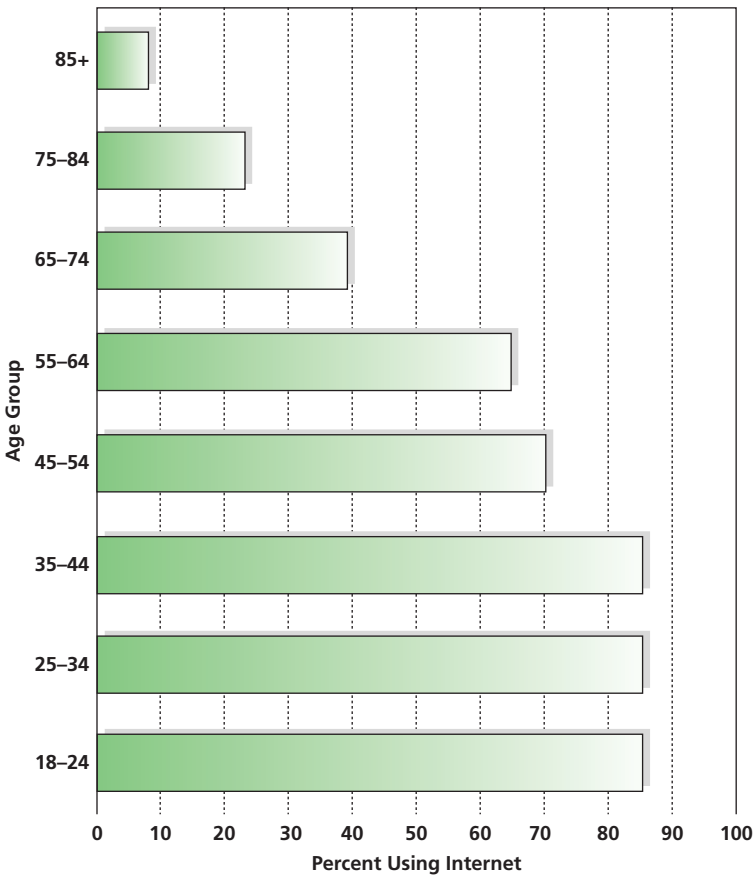
Why are older people less likely to use technology? One is that they are less interested and motivated, in part because they are less likely to be working and therefore less in need of learning new technology skills. But another barrier is cognitive. For example, because fluid intelligence (the ability to deal with new problems and situations) shows some declines with age, this may impact on the ability to learn technology (Ownby et al., 2008; Charness & Boot, 2009).

This hardly means that people in late adulthood are unable to learn to use technology. An increasing number of individuals are using e-mail and social networking sites, such as Facebook. It is likely that the lag in the adoption of technology between younger and older adults will decrease as technology use becomes even more widespread in the general society (Lee & Czaja, 2009).

Figure 17-15 Technology Use and Age

Older individuals in the United States are far less likely to use the Internet than those who are younger.

(**Source:** Charness & Boot, 2009, Figure 1A.)



Module 17.3 Review

- Although some intellectual abilities gradually decline throughout adulthood, starting at around age 25, others stay relatively steady. The intellect retains considerable plasticity and can be maintained with stimulation, practice, and motivation.
- Declines in memory affect mainly episodic memories and short-term memory. Explanations of memory changes in old age have focused on environmental factors, information processing declines, and biological factors.
- Older people can enjoy and participate actively in college-level and other classes, and their presence in classes with younger people adds a different and welcome perspective.

Journal Writing Prompt

Applying Lifespan Development: Do you think steady or increasing crystallized intelligence can partially or fully compensate for declines in fluid intelligence? Why or why not?

Epilogue

Who are the old, and how old are they? In this chapter we began by reviewing the demographics of old age and looking at the phenomenon of ageism. We discussed health and wellness during late adulthood and found that older people can extend their well-being through good diet, good habits, and good exercise. We also discussed the length of the life span and explored some of the reasons why life expectancy has been increasing. We ended with an examination of cognitive abilities among the elderly and evidence showing that there are considerable discrepancies between stereotypical views of older people's intellectual abilities and memory and reality.

Return to the prologue of this chapter, about John Benjamin, who would like to live forever, and answer the following questions.

1. How does John's *functional age* compare with his *demographic age*? How do you think the two will compare five years from now?
2. What factors in John's background and current life likely contribute to the fact that his cognitive abilities have experienced no discernible decline?
3. How has John been affected by primary aging? How has his lifestyle affected his secondary aging?
4. John wants to live forever. What are some of the new approaches that may increase longevity for humans?

Looking Back

LO 17.1 Describe what it is like to grow old in the United States today.

The number and proportion of older people in the United States and many other countries are larger than ever, and elderly people are the fastest growing segment of the U.S. population. Older people as a group are subjected to stereotyping and discrimination, a phenomenon referred to as *ageism*.

LO 17.2 Summarize the physical changes that occur in old age.

Old age is a period in which outward physical changes unmistakably indicate aging, but many older people remain fit, active, and agile well into the period. Older people experience a decrease in brain size and a reduction of blood flow (and oxygen) to all parts of the body, including the brain. The circulatory, respiratory, and digestive systems all work with less efficiency.

LO 17.3 Explain the extent to which people slow down as they age and the consequences of this slowing.

Reaction time among the elderly is slower, a fact that is explained by the peripheral slowing hypothesis (processing speed in the peripheral nervous system slows down) and the generalized slowing hypothesis (processing in all parts of the nervous system slows down).

LO 17.4 Describe how the senses are affected by aging.

Physical changes in the eye bring declines in vision, and several eye diseases become more prevalent in old age, including cataracts, glaucoma, and age-related macular degeneration (AMD). Hearing also declines, particularly the ability to hear higher frequencies. Hearing loss has psychological and social consequences, since it discourages older people from engaging in social interactions. Declines in the senses of taste and smell also occur in late adulthood.

LO 17.5 Describe the general state of health of older people and to what disorders they are susceptible.

Although some people are healthy, the incidence of certain serious diseases rises in old age and the ability to recuperate declines. Most older people suffer from at least one long-term ailment. The leading causes of death in old age are heart disease, cancer, and stroke. Older people are also susceptible to psychological disorders, such as depression, and brain disorders, especially Alzheimer's disease.

LO 17.6 Summarize how wellness can be maintained in old age.

Psychological and lifestyle factors can influence wellness in old age. A sense of control over one's life and environment can have positive effects, as can a proper diet, exercise, and the avoidance of risk factors, such as smoking.

LO 17.7 Describe how sexuality is affected by aging.

Despite some changes in sexual functioning, sexuality continues throughout old age, provided both physical and mental health are good.

LO 17.8 Identify the factors involved with life span and the causes of death.

The inevitability of death is unquestioned but unexplained. Genetic programming theories claim that the body has a built-in time limit on life, while wear-and-tear theories maintain that the body simply wears out. Life expectancy has been rising steadily for centuries and continues to do so, with differences according to gender, race, and ethnicity.

LO 17.9 Discuss the possible extension of the life span through scientific advances and its implications.

The life span may be further increased by technological advances such as telomere therapy, the use of antioxidant drugs to reduce free radicals, development of low-calorie diets, and organ replacement.

LO 17.10 Describe how well older adults function cognitively.

According to sequential studies, such as those conducted by developmental psychologist K. Warner Schaie, intellectual abilities tend to decline slowly throughout old age, but different abilities change in different ways. Training, stimulation, practice, and motivation can help older people maintain their mental abilities.

LO 17.11 Discuss in what ways memory does and does not decline in late adulthood.

Loss of memory in late adulthood is not general but specific to certain kinds of memory. Episodic memories are most affected, while semantic and implicit memories are largely unaffected. Short-term memory declines gradually until age 70, then deteriorates quickly. Explanations of memory changes may focus on environmental factors, information processing declines, and biological factors. Which approach is most accurate is not entirely settled.

LO 17.12 Describe how learning and education continue in late adulthood.

The popularity of programs like Road Scholar attests to the desire of many older people to continue learning. Older students can significantly enhance college courses by bringing their experiences and prior learning to the classroom.

Key Terms and Concepts

gerontologists 564
ageism 564
primary aging 567
secondary aging 567
osteoporosis 567
peripheral slowing hypothesis 569
generalized slowing hypothesis 569
dementia 575
Alzheimer's disease 575
genetic programming theories of aging 579
wear-and-tear theories of aging 580
life expectancy 580
plasticity 586
autobiographical memory 587

Chapter 18

Social and Personality Development in Late Adulthood

Learning Objectives

LO 18.1 Describe ways in which personality develops during late adulthood.

LO 18.2 Explain how age relates to the distribution of resources, power, and privilege.

LO 18.3 Define wisdom and describe how it is correlated with age.

LO 18.4 Differentiate the theories of aging.

LO 18.5 Describe the circumstances in which older people live and the difficulties they face.

LO 18.6 Discuss how financially secure older people are in the United States today.

LO 18.7 Summarize the positives and negatives of retiring as well as typical stages retired people pass through.

LO 18.8 Describe how marriages fare in late adulthood.

LO 18.9 Describe the typical reactions to the death of a spouse during late adulthood.

LO 18.10 Discuss the nature of relationships in late adulthood.

LO 18.11 Explain how aging affects family relationships.

LO 18.12 Discuss what causes elder abuse and how it can be prevented.

Chapter Overview

Prologue: Pottering about in the Sun

Simone Thomas, 81, sets up her easel and watercolors in the garden of her California home. "I've been illustrating children's books for 50 years," she says. Simone had once hoped to become a famous painter and after art school moved to Italy to pursue her dream. "I didn't become the next Michelangelo," she says, laughing, "but my life worked out just fine. I met my husband Gabriel over there, so how could things have gone better?"

Gabriel died five years ago. "It was really hard to get through that first year," Simone admits. "I went to Italy and remembered it all, our meeting and falling in love, and I cried a lot. But then I came home and started illustrating two new books. It's a lifeline, my work, and though I only take on about half as many jobs as I used to, it pays the rent, and I get to spend time doing what I love. That's mainly playing the piano rather badly and walking the beach with my grandkids when they visit."

The newest thing in Simone's life? "My brother Dev lost his wife to cancer last year, so I've asked him to move in with me. We've always been close, and he's good about pulling his own weight with cooking and such. We'll be a happy pair of geriatrics, pottering about in the sun." ■

Looking Ahead

The desire to be productive and useful is not exclusive to any age group. For people in late adulthood such as Simone, talents honed over a lifetime and connections to family offer rich opportunities to stay active and connected with others.

We turn in this chapter to the social and emotional aspects of late adulthood, which remain as central an aspect of life as in earlier stages of the life span. We begin by considering how personality continues to develop in elderly individuals, and then turn to an examination of various ways people can age successfully.

Next, we consider how various societal factors affect the day-to-day living conditions of older adults. We discuss options in living arrangements, as well as ways economic and financial issues influence people's lives. We also look at how culture governs the way we treat older people, and we examine the influence of work and retirement on elderly individuals, considering the ways retirement can be optimized.

Finally, we consider relationships in late adulthood, not only among married couples but also among other relatives and friends. We will see how the social networks of late adulthood continue to play an important—and sustaining—role in people's lives. We examine how events such as

Many grandparents include their grandchildren as an integral part of their social networks.

the divorce of a parent, decades earlier, can still have a critical impact on the course of people's lives. We end with a discussion of the growing phenomenon of elder abuse.

Personality Development and Successful Aging

> *Greta Roach has a puckish manner, a habit of nudging you when she is about to say something funny. This happens often, because that is how she views the world. Even last year's knee injury, which forced her to drop out of her bowling league and halted the march of blue-and-chrome trophies across her living-room table, is not—in her mind—a frailty of age.*
>
> *Roach, 93, takes the same spirited approach to life in her 90s as she did in her 20s, something not all elders can do. . . . "I enjoy life. I belong to all the clubs. I love to talk on the telephone. I write to my old friends." She pauses. "Those that are still alive." (Pappano, 1994, pp. 19, 30)*

In many ways, Roach, with her wit, high spirits, and enormous activity level, is much the same person she was in earlier years. Yet for other older adults, time and circumstances seem to bring changes in their outlook on life, in their views of themselves, and perhaps even in their basic personalities. One of the fundamental questions asked by lifespan developmentalists concerns the degree to which personality either remains stable or changes in later adulthood.

Continuity and Change in Personality during Late Adulthood

LO 18.1 Describe ways in which personality develops during late adulthood.

Is personality relatively stable throughout adulthood or does it vary in significant ways? The answer, it turns out, depends on which facets of personality we wish to consider. According to developmental psychologists Paul Costa and Robert McCrae, the "Big Five" basic personality traits (neuroticism, extroversion, openness, agreeableness, and conscientiousness) are remarkably stable across adulthood. For instance, even-tempered people at age 20 are still even-tempered at age 75, and people who hold positive self-concepts early in adulthood still view themselves positively in late adulthood (Costa & McCrae, 1997; McCrae & Costa, 2003; Curtis, Windsor, & Soubelet, 2015).

For example, at age 93, Greta Roach is still active and humorous, as she was in her 20s. Similarly, other longitudinal investigations have found that personality traits remain quite stable. Consequently, there seems to be a fundamental continuity to personality (Field & Millsap, 1991).

Despite this general stability of basic personality traits, there is still the possibility of change over time. As we noted in Chapter 16, the profound changes that occur throughout adulthood in people's social environments may produce fluctuations and changes in personality. What is important to a person at age 80 is not necessarily the same as what was important at age 40.

In order to account for these sorts of changes, some theorists have focused their attention on the discontinuities of development. As we'll see next, the work of Erik Erikson, Robert Peck, Daniel Levinson, and Bernice Neugarten has examined the changes in personality that occur as a result of new challenges that appear in later adulthood.

ego-integrity-versus-despair stage
Erikson's final stage of life, characterized by a process of looking back over one's life, evaluating it, and coming to terms with it

EGO INTEGRITY VERSUS DESPAIR: ERIKSON'S FINAL STAGE. Psychoanalyst Erik Erikson's final word on personality concerns late adulthood, the time, he suggested, when elderly people move into the last of life's eight stages of psychosocial development. Labeled the **ego-integrity-versus-despair stage**, this last period is characterized by a process of looking back over one's life, evaluating it, and coming to terms with it.

People who are successful in this stage of development experience a sense of satisfaction and accomplishment, which Erikson terms "integrity." When people achieve integrity, they feel that they have realized and fulfilled the possibilities that have come their way in life, and they have few regrets. On the other hand, some people look back on their lives with dissatisfaction. They may feel that they have missed important opportunities and have not accomplished what they wished. Such individuals may be unhappy, depressed, angry, or despondent over what they have done or failed to do with their lives—in short, they despair.

PECK'S DEVELOPMENTAL TASKS. Although Erikson's approach provides a picture of the broad possibilities of later adulthood, other theorists offer a more differentiated view of what occurs in the final stage of life. For instance, psychologist Robert Peck (1968) suggests that personality development in elderly people is occupied by three major developmental tasks or challenges.

In Peck's view—which is part of a comprehensive description of change across adulthood—the first task in old age is that people must redefine themselves in ways that do not relate to their work roles or occupations. He labels this stage **redefinition of self versus preoccupation with work role**. As we will see when we discuss retirement, the changes that occur when people stop working can trigger a difficult adjustment that has a major impact on the way people view themselves. Peck suggests that people must adjust their values to place less emphasis on themselves as workers or professionals and more on attributes that don't involve work, such as being a grandparent or a gardener.

redefinition of self versus preoccupation with work role
the theory that those in old age must redefine themselves in ways that do not relate to their work roles or occupations

The second major developmental task in late adulthood, according to Peck, is **body transcendence versus body preoccupation**. As we saw in Chapter 17, elderly individuals can undergo significant changes in their physical capabilities as a result of aging. In the body-transcendence-versus-body-preoccupation stage, people must learn to cope with and move beyond those physical changes (transcendence). If they don't, they become preoccupied with their physical deterioration, to the detriment of their personality development. Greta Roach, who just gave up bowling in her 90s, is an example of someone who is coping well with the physical changes of aging.

body transcendence versus body preoccupation
a period in which people must learn to cope with and move beyond changes in physical capabilities as a result of aging

Finally, the third developmental task faced by those in old age is **ego transcendence versus ego preoccupation**, in which elderly people must come to grips with their coming death. They need to understand that although death is inevitable, and probably not too far off, they have made contributions to society. If people in late adulthood see these contributions, which can take the form of children or work- and civic-related activities, as lasting beyond their own lives, they will experience ego transcendence. If not, they may become preoccupied with the question of whether their lives had value and worth to society.

ego transcendence versus ego preoccupation
the period in which elderly people must come to grips with their coming death

LEVINSON'S FINAL SEASON: THE WINTER OF LIFE. Daniel Levinson's theory of adult development does not focus as much as Erikson's and Peck's theories on the challenges that aging adults must overcome. Instead, he looks at the processes that can lead to personality change as we grow old. According to Levinson, people enter late adulthood by passing through a transition stage that typically occurs around age 60 to 65 (Levinson, 1986, 1992). During this transition period, people come to view themselves as entering late adulthood—or, ultimately, as being "old." Knowing full well what society's stereotypes about elderly individuals are, and how negative they can be, people struggle with the notion that they are now in this category.

According to Levinson, with age people come to realize that they are no longer on the center stage of life but are increasingly playing bit parts. This loss of power, respect, and authority may be difficult for individuals accustomed to having control in their lives.

On the positive side, people in late adulthood can serve as resources to younger individuals, and they may find themselves regarded as "venerated elders" whose advice is sought and relied upon. Furthermore, old age can bring with it a new freedom to do things for the simple sake of the enjoyment and pleasure they bring rather than because they are obligations.

COPING WITH AGING: NEUGARTEN'S STUDY. Rather than focusing on the commonalities of aging, or the processes and tasks involved in aging, Bernice Neugarten (1972, 1977)—in what became a classic study—examined the different ways that people cope with aging. Neugarten found four different personality types in her research on people in their 70s:

- *Disintegrated and disorganized personalities.* Some people are unable to accept aging, and they experience despair as they get older. They are often found in nursing homes or are hospitalized.
- *Passive-dependent personalities.* Others become fearful with age—fear of falling ill, fear of the future, fear of their own inability to cope. They are so fearful that they may seek out help from family and care providers, even when they don't need it.
- *Defended personalities.* Others respond to the fear of aging in a quite different manner. They try to stop it in its tracks. They may attempt to act young, exercising vigorously and engaging in youthful activities. Unfortunately, they may set up unrealistic expectations for themselves and run the risk of feeling disappointed as a result.
- *Integrated personalities.* The most successful individuals cope comfortably with aging. They accept becoming older and maintain a sense of self-dignity.

Neugarten found that the majority of the people she studied fell into the final category. They acknowledged aging and were able to look back at their lives and gaze into the future with acceptance.

LIFE REVIEW AND REMINISCENCE: THE COMMON THEME OF PERSONALITY DEVELOPMENT. Looking back over one's life is a major thread running through the work of Erikson, Peck, Levinson, and Neugarten's views of personality development in old age. Indeed, **life review**, in which people examine and evaluate their lives, is a common theme for most personality theorists who focus on late adulthood.

life review
the point in life in which people examine and evaluate their lives

According to gerontologist Robert Butler (2002), life review is triggered by the increasingly obvious prospect of one's death. As people age, they look back on their lives, remembering and reconsidering what has happened to them. We might at first suspect that such reminiscence may be harmful, as people relive the past, wallow in past problems, and revive old wounds, but this is not the case at all. By reviewing the events of their lives, elderly people often come to a better understanding of their past. They may be able to resolve lingering problems and conflicts that they had with particular people, such as an estrangement from a child, and they may feel they can face their current lives with greater serenity (Bohlmeijer, Westerhof, & de Jong, 2008; Korte, Westerhof, & Bohlmeijer, 2012; Latorre et al., 2015).

The process of life review can improve memory and foster feelings of interconnectedness.

Life review offers other benefits. For example, reminiscence may lead to a sense of sharing and mutuality, a feeling of interconnectedness with others. Moreover, it can be a source of social interaction as older adults seek to share their prior experiences with others (Parks, Sanna, & Posey, 2003).

Reminiscence may even have cognitive benefits, improving memory in older people. By reflecting on the past, people activate a variety of memories about people and events in their lives. In turn, these memories may trigger other, related memories and may bring back sights, sounds, and even smells of the past.

The outcomes of life review and reminiscence are not always positive. People who become obsessive about the past, reliving old insults and mistakes that cannot be rectified, may end up feeling guilt, depression, and anger against people from the past who may not even still be alive. In such cases, reminiscence produces declines in psychological functioning (DeGenova, 1993; Cappeliez, Guindon, & Robitaille, 2008).

Overall, however, the process of life review and reminiscence can play an important role in the ongoing lives of elderly individuals. It provides continuity between past and present, and may increase awareness of the contemporary world. It also can provide new insights into the past and into others, allowing people to continue personality growth and to function more effectively in the present (Coleman, 2005; Haber, 2006; Alwin, 2012).

Age Stratification Approaches to Late Adulthood

LO 18.2 Explain how age relates to the distribution of resources, power, and privilege.

Age, like race and gender, provides a way of ranking people within a given society. **Age stratification theories** suggest that economic resources, power, and privilege are distributed unequally among people at different stages of the life course. Such inequality is particularly pronounced during late adulthood.

age stratification theories
the view that an unequal distribution of economic resources, power, and privilege exists among people at different stages of the life course

Even as advances in medical technologies have led to a longer life span, power and prestige for the elderly have eroded, at least in industrialized societies. For example, the peak earning years are the 50s; later, earnings tend to decline. Furthermore, younger people have more independence and are often physically removed from their elders, making them less dependent on older adults. In addition, rapidly changing technology causes older adults to be seen as lacking important skills. Ultimately, older adults are regarded as not particularly productive members of society and in some cases simply irrelevant (Macionis, 2001). As Levinson's theory emphasizes, people are certainly aware of the declines in status that accompany growing old in Western societies. Levinson considers adjusting to them to be the major transition of late adulthood.

Age stratification theories help explain why aging is viewed more positively in less industrialized societies. For example, in cultures in which agricultural activities predominate, older people can accumulate control over important resources, such as animals and land. In such societies, in which the concept of retirement is unknown, older individuals (especially older males) are exceptionally respected, in part because they continue to be involved in daily activities central to the society. Furthermore, because agricultural practices change at a less rapid pace than the technological advances that characterize more industrialized societies, people in late adulthood are seen as possessing considerable wisdom. Cultural values that stress respect for elders are not limited to less industrialized countries. They shape how elderly adults are treated in a variety of societies, as discussed in the *Developmental Diversity and Your Life* feature.

Does Age Bring Wisdom?

LO 18.3 Define wisdom and describe how it is correlated with age.

One of the benefits of age is supposed to be wisdom. But does the average elderly person have wisdom, and do people gain wisdom as they become older?

Although it seems reasonable to believe that we get wiser as we get older, we don't know for sure because the concept of **wisdom**—expert knowledge in the practical aspects of life—has, until recent years, received little attention from gerontologists and other researchers. In part, this lack of attention stems from the difficulty in defining and measuring the concept, which is unusually vague (Baltes & Smith, 2008; Meeks & Jeste, 2009; Montepare, Kempler, & McLaughlin-Volpe, 2014).

wisdom
expert knowledge in the practical aspects of life

Wisdom can be seen as reflecting an accumulation of knowledge, experience, and contemplation, and by this definition, older age may be necessary, or at least helpful, to acquiring true wisdom (Kunzmann & Baltes, 2005; Staudinger, 2008; Randall, 2012).

Developmental Diversity and Your Life

How Culture Shapes the Way We Treat People in Late Adulthood

The view we hold of late adulthood is colored by the culture in which we live. For example, Asian societies, in general, hold elderly people, particularly members of their own families, in higher esteem than Western cultures tend to. Although the strength of this standard has been declining in areas of Asia in which industrialization has been increasing rapidly, such as Japan, the view of aging and the treatment of people in late adulthood still tend to be more positive than in Western cultures (Cobbe, 2003; Degnen, 2007; Smith & Hung, 2012).

What is it about Asian cultures that leads to higher levels of esteem for old age? In general, cultures that hold the elderly in high regard are relatively homogeneous in socioeconomic terms. In addition, the roles that people play in those societies entail greater responsibility with increasing age, and elderly people control resources to a relatively large extent.

Moreover, the roles played by people in Asian society display more continuity throughout the life span than in Western cultures, and older adults continue to engage in activities that are valued by society. Finally, Asian cultures are more organized around extended families in which the older generations are well integrated into the family structure (Fry, 1985; Sangree, 1989). In such an arrangement, younger family members may come to see older members as having accumulated a great deal of wisdom, which they can share.

On the other hand, even those societies that articulate strong ideals regarding the treatment of older adults do not always live up to those standards. For instance, the Chinese people, whose admiration, respect, and even worship for individuals in late adulthood are strong, show that people's actual behavior, in almost every segment of the society except for the most elite, fails to be as positive as their attitudes are. Furthermore, it is typically sons and their wives who are expected to care for elderly parents; parents with just daughters may find themselves with no one to care for them in late adulthood. In short, conduct toward elderly people in particular cultures is not uniform, and it is important not to make broad, global statements about how older adults are treated in a given society (Comunian & Gielen, 2000; Li, Ji & Chen, 2014).

It is not just Asian cultures that hold the elderly in particular esteem. For example, in Latino cultures, the elderly are thought to have a special inner strength, and they are assumed to be a valuable resource for younger individuals in a family. In many African cultures, reaching an old age is seen as a sign of divine intervention, and the elderly are called "big person" in a number of African languages (Diop, 1989; Holmes & Holmes, 1995; Lehr, Seiler, & Thomae, 2000).

What aspects of Asian cultures lead them to hold higher levels of esteem for old age?

Wisdom is not the same as intelligence, but distinguishing these two qualities can be tricky. Some researchers suggest that a primary distinction is related to timing: Whereas knowledge that is derived from intelligence is related to the here-and-now, wisdom is a more timeless quality. Intelligence may permit a person to think logically and systematically, but wisdom provides an understanding of human behavior. According to psychologist Robert Sternberg, who has conducted considerable research related to practical intelligence, intelligence permits humans to invent the atom bomb, whereas wisdom prevents them from using it (Karelitz, Jarvin, & Sternberg, 2010; Wink & Staudinger, 2015).

Measuring wisdom is difficult. Ursula Staudinger and Paul Baltes (2000) designed a study showing that it is possible to assess people reliably on the concept. Pairs of people

ranging in age from 20 to 70 years discussed difficulties relating to life events. One problem involved someone who gets a phone call from a good friend who says that he or she is planning to commit suicide. Another involved a 14-year-old girl who wanted to move out of her family home immediately. Participants were asked what they should do and consider.

Although there were no absolute right or wrong answers to these problems, the responses were evaluated against several criteria, including the amount of factual knowledge the participants brought to bear on the problem; their knowledge about decision-making strategies, such as considering the consequences of a decision; how well the participants considered the problem within the context of the central character's life span and the values that the central character may hold; and whether the participants recognized that there may not be a single, absolute solution.

Using these criteria, participants' responses were rated as relatively wise or unwise. For instance, an example of a response to the suicide problem rated as particularly wise is the following:

> *On the one hand this problem has a pragmatic side, one has to react one way or another. On the other hand, it also has a philosophical side whether human beings are allowed to kill themselves etc. . . . First one would need to find out whether this decision is the result of a longer process or whether it is a reaction to a momentary life situation. In the latter case, it is uncertain how long this condition will last. There can be conditions that make suicide conceivable. But I think no one should be easily released from life. They should be forced to "fight" for their death if they really want it. . . . It seems that one has a responsibility to try to show the person alternative pathways. Currently, for example, there seems to be a trend in our society that it becomes more and more accepted that old people commit suicide. This can also be viewed as dangerous. Not because of the suicide itself but because of its functionality for society. (Staudinger & Baltes, 1996, p. 762)*

The Staudinger and Baltes study also found that the older participants benefited more from an experimental condition designed to promote wise thinking, and other research suggests that the very wisest individuals may be older adults.

Other research has looked at wisdom in terms of the development of theory of mind—the ability to make inferences about others' thoughts, feelings, and intentions, their mental states. Although the research findings are mixed, some research finds that older adults, with their added years of experience to draw upon, utilize a more sophisticated theory of mind (Karelitz, Jarvin, & Sternberg, 2010; Rakoczy, Harder-Kasten, & Sturm, 2012).

Successful Aging: What Is the Secret?

LO 18.4 Differentiate the theories of aging.

> *At age 77, Elinor Reynolds spends most of her time at home, leading a quiet, routine existence. Never married, Elinor receives visits from her two sisters every few weeks, and some of her nieces and nephews stop by on occasion. But for the most part, she keeps to herself. When asked, she says she is quite happy.*
>
> *In contrast, Carrie Masterson, also 77, is involved in something different almost every day. If she is not visiting the senior center, participating in some kind of activity, she is out shopping. Her daughter complains that Carrie is "never home" when she tries to reach her by phone, and Carrie replies that she has never been busier—or happier.*

Clearly, there is no single way to age successfully. How people age depends on personality factors and the circumstances in which people find themselves. Some people become progressively less involved with day-to-day events, whereas others maintain active ties to people and their areas of personal interest. Three major approaches provide explanations: disengagement theory, activity theory, and continuity theory. While disengagement theory suggests that successful aging is characterized by gradual withdrawal, activity theory argues that successful aging occurs when people maintain their

engagement with the world. Continuity theory takes a compromise position, suggesting that what is important is maintaining a desired level of involvement. We'll consider each approach in turn.

disengagement theory
theory suggesting that late adulthood is marked by a gradual withdrawal from the world on physical, psychological, and social levels

DISENGAGEMENT THEORY: GRADUAL RETREAT. According to **disengagement theory**, late adulthood often involves a gradual withdrawal from the world on physical, psychological, and social levels (Cummings & Henry, 1961). On a physical level, elderly people have lower energy levels and tend to slow down progressively. Psychologically, they begin to withdraw from others, showing less interest in the world around them and spending more time looking inward. Finally, on a social level, they engage in less interaction with others, in terms of both day-to-day, face-to-face encounters and participation in society as a whole. Some older adults also become less involved and invested in the lives of others.

Disengagement theory suggests that withdrawal is a mutual process. Because of norms and expectations about aging, society in general begins to disengage from those in late adulthood. For example, mandatory retirement ages compel elderly people to withdraw from work-related roles, thereby accelerating the process of disengagement.

Although there is some logic to disengagement theory, research has not been supportive. Furthermore, the theory has been criticized because it takes the failure of society to provide sufficient opportunities for meaningful engagement during late adulthood and then, in a sense, blames people in this age group for not being engaged.

Of course, some degree of disengagement is not necessarily negative. For example, a gradual withdrawal in late adulthood may permit people to become more reflective about their own lives and less constrained by social roles. Furthermore, people can become more discerning in their social relationships, focusing on those who best meet their needs (Settersten, 2002; Wrosch, Bauer, & Scheier, 2005; Liang & Luo, 2012).

Still, most gerontologists reject disengagement theory, pointing out that disengagement is relatively uncommon. In most cases, people remain engaged, active, and busy throughout old age, and (especially in non-Western cultures) the expectation is that people will remain actively involved in everyday life. Clearly, disengagement is not an automatic, universal process (Bergstrom & Holmes, 2000; Crosnoe & Elder, 2002).

activity theory
the theory suggesting that successful aging occurs when people maintain the interests, activities, and social interactions with which they were involved during middle age

ACTIVITY THEORY: CONTINUED INVOLVEMENT. The lack of support for disengagement theory led to an alternative, known as activity theory. **Activity theory** suggests that successful aging occurs when people maintain the interests and activities they pursued during middle age and resist any decrease in the amount and type of social interaction they have with others. According to this perspective, happiness and satisfaction with life are assumed to spring from a high level of involvement with the world. Moreover, successful aging occurs when older adults adapt to inevitable changes in their environments not by withdrawing but by resisting reductions in their social involvement (Consedine, Magai, & King, 2004; Hutchinson & Wexler, 2007; Rebok et al., 2014).

Activity theory suggests that successful aging in late adulthood reflects a continuation of activities in which elderly people participated earlier. Even in cases in which it is no longer possible to participate in certain activities—such as work, following retirement—activity theory argues that successful aging occurs when replacement activities are found.

But activity theory is not the full story. For one thing, activity theory makes little distinction between various types of activities. Surely not every activity will have an equal impact on a person's happiness and satisfaction with life, and being involved in various activities just for the sake of remaining engaged is unlikely to be satisfying. In sum, the specific nature and quality of the activities in which people engage are likely to be more critical than the mere quantity or frequency of their activities (Adams, 2004).

While disengagement theory suggests that people in late adulthood begin to gradually withdraw from the world, activity theory argues that successful aging occurs when people maintain their involvement with others.

From *a social worker's* perspective

How might cultural factors affect an older person's likelihood of pursuing either the disengagement strategy or the activity strategy?

A more significant concern is that for some people in late adulthood, the principle of "less is more" clearly holds. For such individuals, less activity brings greater enjoyment of life. They are able to slow down and do only the things that bring them the greatest satisfaction. In fact, some people view the ability to moderate their pace as one of the bounties of late adulthood. For them, a relatively inactive, and perhaps even solitary, existence is welcomed.

In short, neither disengagement theory nor activity theory provides a complete picture of successful aging. For some people, a gradual disengagement occurs, and this leads to relatively high levels of happiness and satisfaction. For others, preserving a significant level of activity and involvement leads to greater satisfaction (Ouwehand, de Ridder, & Bensing, 2007).

CONTINUITY THEORY: A COMPROMISE POSITION. The current view of successful aging is a compromise between a certain degree of disengagement and activity. **Continuity theory** suggests that people simply need to maintain their desired level of involvement in society in order to maximize their sense of well-being and self-esteem (Whitbourne, 2001; Atchley, 2003).

continuity theory
the theory suggesting that people need to maintain their desired level of involvement in society in order to maximize their sense of well-being and self-esteem

According to continuity theory, those who were highly active and social will be happiest if they largely remain so. Those more retiring individuals, who enjoy solitude and solitary interests, such as reading or walks in the woods, will be happiest if they are free to pursue that level of sociability (Holahan & Chapman, 2002; Wang et al., 2014).

It is also clear that, regardless of the level of activity in which older adults engage, most experience positive emotions as frequently as younger individuals. Furthermore, they become more skilled in regulating their emotions.

Other factors enhance feelings of happiness during late adulthood. For instance, good physical and mental health is clearly important in determining an elderly person's overall sense of well-being. Similarly, having enough financial security to provide for basic needs, including food, shelter, and medical care, is critical. In addition, a sense of autonomy, independence, and personal control over one's life is a significant advantage (Charles, Mather, & Carstensen, 2003; Charles & Carstensen, 2010; Vacha-Haase, Hil, & Bermingham, 2012).

From Research to Practice

Is Age Really Just a State of Mind?

If you walked into a certain monastery in New Hampshire in 1981, it would have felt like taking an instantaneous journey through time. Inside those walls it was 1959 again. Everything was from that time period, including the décor, the books and magazines—even the programming on the radio and on the small black-and-white television. This was no time capsule, though—it was a pioneering study of the connection between mind and body. Psychologist Ellen Langer brought eight men in their 70s to the monastery to spend five days living as if they were suddenly 20 years younger. During that time they could not see their reflections—only portraits of how they used to look in their 50s. They were no longer treated like old men, instead being expected to take care of themselves. They talked about events of the late 50s as if they were present day. In every way possible, the illusion was created that the last 22 years had been wiped away from their lives (Grierson, 2014).

A remarkable thing happened at the end of the study: the men weren't just pretending to be younger. They were acting younger. They were looking younger. And their performance on a number of physiological measures such as strength and dexterity improved. Even their vision improved!

What Langer had showed, in that study and other research, was that the declines of aging were at least partly a state of mind. People act old because they think of themselves as old. But when they think of themselves as youthful and have purpose and autonomy in their life, they can become rejuvenated. Langer's more recent research continues to show, for example, that people's vision can be improved if they are primed to expect that it will (Alexander & Langer, 1990; Hsu, Chung, & Langer, 2010).

Langer calls this link between mind and body *mindfulness*. It is analogous to the placebo effect: People tend to experience the outcomes they expect to experience. Langer has amassed considerable correlational evidence of the mindfulness phenomenon: Men who go prematurely bald (and therefore see themselves as older) have an increased risk of developing prostate cancer and coronary heart disease. Women who received a new hairstyle that they felt made them appear younger actually showed a drop in blood pressure. Women who have children later in life, and therefore are acting and feeling younger than their years, tend to live longer. And among couples in age-discrepant marriages, the person with the older partner tends to have a shorter than normal life expectancy whereas the person with the younger partner tends to have a longer than normal one (Hsu, Chung, & Langer, 2010).

Langer's current research is taking the mindfulness concept to new heights, testing whether women with terminal late-stage breast cancer will experience a curative benefit from living as if they went back 20 years in time, like the elderly men at the New Hampshire monastery did. Langer hopes that by living life fully as they did before their cancer emerged, these patients' bodies will find a way to make the cancer go away. It's an audacious experiment to say the least—one that puts Langer's mindfulness concept to its toughest test ever. Even a small effect would be revolutionary. Whether that comes to pass or not, only time will tell (Grierson, 2014).

Shared Writing Prompt

What might be some alternative explanations for the correlations Langer reports between various age markers and health?

Finally, the way elderly people perceive old age can influence their happiness and satisfaction. Those who view late adulthood in terms of positive attributes—such as the possibility of gaining knowledge and wisdom—are apt to perceive themselves in a more positive light than those who view old age in a more pessimistic and unfavorable way (Levy, Slade, & Kasl, 2002; Levy, 2003).

Ultimately, as a group, people in late adulthood report being happier than younger people, according to the results of surveys. And it's not that those over 65 have always been happier. Instead, being older seems to bring a degree of contentment in the majority of people (Yang, 2008). Also see the *From Research to Practice* box.

SELECTIVE OPTIMIZATION WITH COMPENSATION: A GENERAL MODEL OF SUCCESSFUL AGING. In considering the factors that lead to successful aging, developmental psychologists Paul Baltes and Margret Baltes focus on the *selective optimization with compensation model* (summarized in Figure 18-1). As we first noted in Chapter 15, the assumption underlying the model is that late adulthood brings with it changes and losses in underlying capabilities, which vary from one person to another. However, it is possible to overcome such shifts in capabilities through selective optimization.

selective optimization
the process by which people concentrate on selected skill areas to compensate for losses in other areas

Selective optimization is the process by which people concentrate on particular skill areas to compensate for losses in other areas. They do this by seeking to fortify their general motivational, cognitive, and physical resources while also, through a process of selection, focusing on particular areas of special interest. A person who has run marathons all her life may have to cut back or give up entirely other activities in order to increase her training. By giving up other activities, she may be able to maintain her running skills through concentration on them (Burnett-Wolle & Godbey, 2007; Scheibner & Leathem, 2012; Hahn & Lachman, 2015).

At the same time, the model suggests that elderly individuals engage in compensation for the losses that they have sustained due to aging. Compensation may take the form, for instance, of employing a hearing aid to offset losses in hearing. Piano virtuoso Arthur Rubinstein provides another example of selective optimization with compensation. In his later years, he maintained his concert career and was acclaimed for his playing. To manage this, he used several strategies that illustrate the model of selective optimization with compensation.

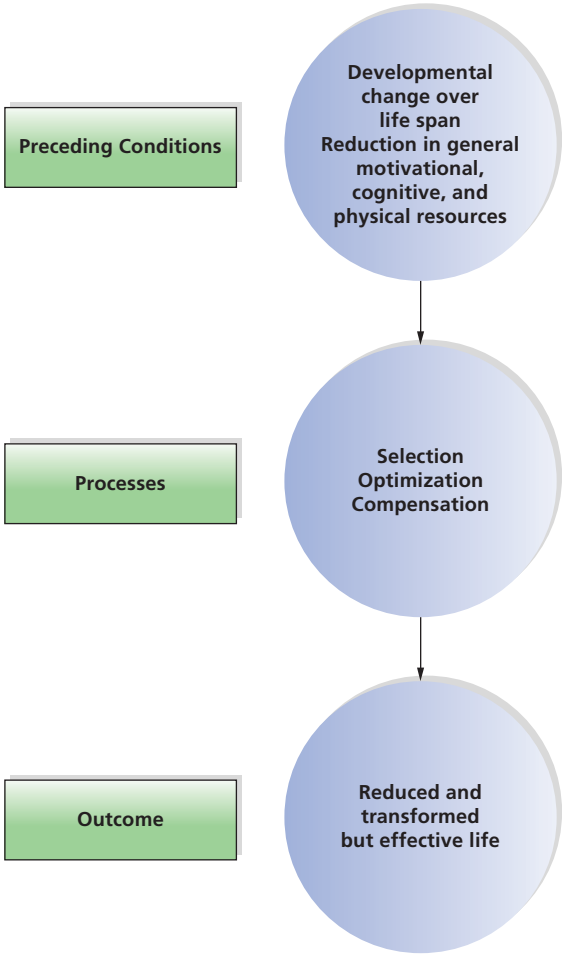
First, Rubinstein reduced the number of pieces he played at concerts—an example of being selective in what he sought to accomplish. Second, he practiced those pieces more often, thus using optimization. Finally, in an example of compensation, he slowed down the tempo of musical passages immediately preceding faster passages, thereby fostering the illusion that he was playing just as fast as he had ever played (Baltes & Baltes, 1990).

In short, the model of selective optimization with compensation illustrates the fundamentals of successful aging. Although late adulthood may bring about various changes in underlying capabilities, people who focus on making the most of their achievements in particular areas may well be able to compensate for any limitations and losses that do occur. The outcome is a life that is reduced in some areas but is also transformed and modified and, ultimately, is effective and successful.

Figure 18-1 Selective Optimization with Compensation

According to the model proposed by Paul Baltes and Margret Baltes, successful aging occurs when an older adult focuses on his or her most important areas of functioning and compensates for losses in other areas. Is this unique to old age?

(**Source:** Based on Baltes & Baltes, 1990.)



Module 18.1 Review

- While some aspects of personality remain stable, others change to reflect the social environments through which people pass as they age. Erikson calls older adulthood the ego-integrity-versus-despair stage, focusing on individuals' feelings about their lives, while Peck focuses on three tasks that define the period. According to Levinson, after struggling with the notion of being old, people can experience liberation and self-regard. Neugarten focuses on the ways people cope with aging.
- Age stratification theories suggest that the unequal distribution of economic resources, power, and privilege becomes particularly pronounced during late adulthood.
- Wisdom is defined as expert knowledge in the practical aspects of life, won through the accumulation of knowledge, experience, and contemplation. Because it is experience-based, wisdom may be dependent on aging. Societies in which elderly people are respected for their wisdom are generally characterized by social homogeneity, extended families, responsible roles for older people, and control of significant resources by older people.
- Disengagement theory suggests that older people gradually withdraw from the world, which can lead to reflection and satisfaction. In contrast, activity theory suggests that the happiest people continue to be engaged with the world. A compromise position—that of continuity theory—may be the most useful approach. The most successful model for aging may be selective optimization with compensation.

Journal Writing Prompt

Applying Lifespan Development: How might personality traits account for success or failure in achieving satisfaction through the life review process?

The Daily Life of Late Adulthood

Before I retired 10 years ago, everyone told me I'd miss work, get lonely, and feel flat without the challenges of business. Baloney! This is the best time of my life! Miss work? No way. What's to miss? Meetings? Training sessions? Evaluations? Sure, there's less money and people, but I have all I need with my savings, my hobbies, and my traveling.

This positive view of life in late adulthood was expressed by a 75-year-old retired insurance worker. Although the story is certainly not the same for all retirees, many, if not most, find their post-work lives happy and involving. We will consider some of the ways in which people lead their lives in late adulthood, beginning with where they live.

Living Arrangements: The Places and Spaces of Their Lives

LO 18.5 Describe the circumstances in which older people live and the difficulties they face.

Think "old age," and if you are like most people, your thoughts soon turn to nursing homes. Popular stereotypes place most elderly people in lonely, unpleasant, institutional surroundings under the care of strangers.

The reality, however, is quite different. Although it is true that some people finish their lives in nursing homes, they are a tiny minority—only 5 percent. Most people live out their entire lives in home environments, typically in the company of at least one other family member.

continuing-care community
a community that offers an environment in which all the residents are of retirement age or older and need various levels of care

LIVING AT HOME. A large number of older adults live alone. People over 65 represent a quarter of America's 9.6 million single-person households. Roughly two-thirds of people over the age of 65 live with other members of the family. In most cases they live with spouses. Some older adults live with their siblings, and others live in multigenerational settings with their children, grandchildren, and even occasionally great-grandchildren.

The consequences of living with a family member are quite varied, depending on the nature of the setting. For married couples, living with a spouse represents continuity with earlier life. For people who move in with their children, the adjustment to life in a multigenerational setting can be jarring. Not only is there a potential loss of independence and privacy, but older adults may feel uncomfortable with the way their children are raising their grandchildren. Unless there are some ground rules about the specific roles that people are to play in the household, conflicts can arise (Navarro, 2006).

Living in a multigenerational setting with children and their families can be rewarding and helpful for those in late adulthood. Are there any disadvantages to this type of situation? What are some solutions?

Living in extended families is more typical for some groups than for other groups. For instance, African Americans are more likely than whites to live in multigenerational families. Furthermore, the amount of influence that family members have over one another and the interdependence of extended families are generally greater in African American, Asian American, and Hispanic families than in Caucasian families (Becker, Beyene, & Newsom, 2003).

SPECIALIZED LIVING ENVIRONMENTS. For some 10 percent of those in late adulthood, home is an institution. As we'll see, elderly people live in a broad range of different types of specialized environments.

One of the more recent innovations in living arrangements is the **continuing-care community**. Such communities typically offer an environment in which all the residents are of retirement age or older. Residents may need various levels of care, which is provided by the community. Residents sign contracts under which the community makes a commitment to provide care at whatever level is needed. In many

such communities, people start out living in separate houses or apartments, either independently or with occasional home care. As they age and their needs increase, residents may eventually move into *assisted living*, in which people live in independent housing but are supported by medical providers to the extent required. Continuing care ultimately extends all the way to full-time nursing care, which is often provided at an on-site nursing home.

Continuing-care communities tend to be fairly homogeneous in terms of religious, racial, and ethnic backgrounds, and they are often organized by private or religious organizations. Because joining may involve a substantial initial payment, members of such communities tend to be relatively well-off financially. Increasingly, though, continuing-care communities are making efforts to raise the level of diversity. Furthermore, they are attempting to increase opportunities for intergenerational interaction by establishing day-care centers on the premises and developing programs that involve younger populations (Chaker, 2003; Berkman, 2006).

Several types of nursing institutions exist, ranging from those that provide part-time day care to homes that offer 24-hour-a-day, live-in care. In **adult day-care facilities**, elderly individuals receive care only during the day but spend nights and weekends in their own homes. During the time that they are at the facility, people receive nursing care, take their meals, and participate in scheduled activities. Sometimes adult facilities are combined with infant and child day-care programs, an arrangement that allows for interaction between the old and the young (Tse & Howie, 2005; Gitlin et al., 2006; Dabelko & Zimmerman, 2008).

adult day-care facilities
settings in which elderly individuals receive care only during the day, but spend nights and weekends in their own homes

Other institutional settings offer more extensive care. The most intensive institutions are **skilled-nursing facilities**, which provide full-time nursing care for people who have chronic illnesses or are recovering from a temporary medical condition. Although only 4.5 percent of those age 65 and older live in nursing homes, the number increases dramatically with age. Around 3 percent of the over-65 population lives in nursing homes, while around 10 percent of the over-85 population live in nursing homes (Administration on Aging, 2006; Nursing Home Data Compendium, 2013).

skilled-nursing facilities
settings that provide full-time nursing care for people who have chronic illnesses or are recovering from a temporary medical condition

The greater the extent of nursing home care, the greater the adjustment required of residents. Although some newcomers adjust relatively rapidly, the loss of independence brought about by institutional life may lead to difficulties. In addition, elderly people are as susceptible as other members of society to society's stereotypes about nursing homes, and their expectations may be particularly negative. They may see themselves as just marking time until they eventually die, forgotten and discarded by a society that venerates youth (Biedenharn & Normoyle, 1991; Baltes, 1996).

INSTITUTIONALISM AND LEARNED HELPLESSNESS. Although the fears of those in nursing homes may be exaggerated, they can lead to **institutionalism**, a psychological state in which people develop apathy, indifference, and a lack of caring about themselves. Institutionalism is brought about, in part, by a sense of *learned helplessness*, a belief that one has no control over one's environment (Peterson & Park, 2007).

institutionalism
a psychological state in which people in nursing homes develop apathy, indifference, and a lack of caring about themselves

The sense of helplessness brought about by institutionalism can literally have deadly consequences. Consider, for instance, what happens when people enter nursing homes in late adulthood. One of the most conspicuous changes from their independent past is that they no longer have control over their most basic activities. They may be told when and what to eat, their sleeping schedules may be arranged by others, and even their visits to the bathroom may be regulated (Wolinsky, Wyrwich, & Babu, 2003; Iecovich & Biderman, 2012; de Oliveira et al., 2014).

A classic experiment showed the consequences of such a loss of control. Psychologists Ellen Langer and Irving Janis (1979) divided elderly residents of a nursing home into two

Elderly people in adult day-care facilities socialize with others during meals and activities.

groups. One group of residents was encouraged to make a variety of choices about their day-to-day activities. The other group was given no choices and was encouraged to let the nursing home staff care for them. The results were clear. The participants who had choices were not only happier, they were also healthier: 18 months after the experiment began, only 15 percent of the choice group had died—compared to 30 percent of the comparison group.

In short, the loss of control over certain aspects of their daily life experienced by residents of nursing homes and other institutions can have a profound effect on their well-being. Keep in mind that not all nursing homes are the same, however. The best go out of their way to permit residents to make basic life decisions, and they attempt to give people in late adulthood a sense of control over their lives.

From *a health-care professional's* perspective

What policies might a nursing home institute to minimize the chances that its residents will develop institutionalism? Why are such policies relatively uncommon?

Financial Issues: The Economics of Late Adulthood

LO 18.6 Discuss how financially secure older people are in the United States today.

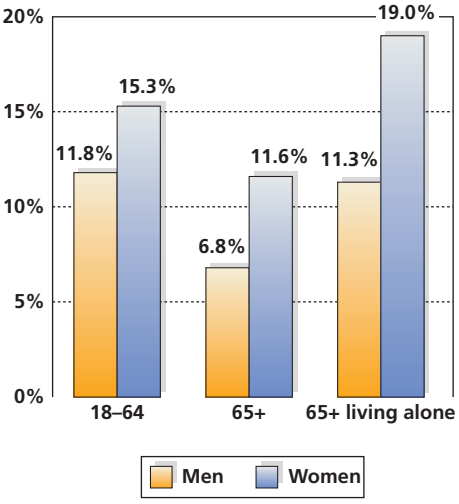
People in late adulthood, like people in all other stages of life, range from one end of the socioeconomic spectrum to the other. Like the man quoted earlier in this section of the chapter, those who were relatively affluent during their working years tend to remain relatively affluent, while those who were poor at earlier stages of life tend to remain poor when they reach late adulthood.

However, the social inequities that various groups experience during their earlier lives become magnified with increasing age. At the same time, people who reach late adulthood today may experience growing economic pressure as a result of the ever-increasing human life span, which means it is more likely they will run through their savings.

Overall, just under 10 percent of people age 65 and older live in poverty, a proportion that is quite close to that for people less than age 65. However, there are significant differences in gender and racial groups. For instance, women are almost twice as likely as men to be living in poverty. Of those elderly women living alone, around one-fourth live on incomes below the poverty line. A married woman may also slip into poverty if she becomes widowed, for she may have used up savings to pay for her husband's final illness, and the husband's pension may cease with his death (Spraggins, 2003; see Figure 18.2).

Figure 18.2 Poverty and the Elderly

While 10 percent of those 65 years of age and older live in poverty, women are almost twice as likely as men to be living in poverty. (**Source:** DeNavas-Walt, Proctor, & Smith, 2013.)



Furthermore, 8 percent of whites in late adulthood live below the poverty level, 19 percent of Hispanics, and 24 percent of African Americans. Minority women fare the worst of any category. For example, divorced black women aged 65 to 74 had a poverty rate of 47 percent (Federal Interagency Forum on Age-Related Statistics, 2000; U.S. Bureau of the Census, 2013).

One source of financial vulnerability for people in late adulthood is the reliance on a fixed income for support. Unlike that of a younger person, the income of an elderly person, which typically comes from a combination of Social Security benefits, pensions, and savings, rarely keeps up with inflation. Consequently, as inflation drives up the price of goods such as food and clothing, income does not rise as quickly. What may have been a reasonable income at age 65 is worth much less 20 years later, as the elderly person gradually slips into poverty.

The rising cost of health care is another source of financial vulnerability in older adults. The average older person spends close to 20 percent of his or her income for health-care costs. For those who require care in nursing home facilities, the financial costs can be staggering, running an average of close to $80,000 a year (MetLife Mature Market Institute, 2009).

Unless major changes are made in the way that Social Security and Medicare are financed, the costs borne by younger U.S. citizens in the workforce must rise

significantly. Increasing expenditures mean that a larger proportion of younger people's pay must be taxed to fund benefits for the elderly. Such a situation is apt to lead to increasing friction and segregation between younger and older generations. Indeed, as we'll see, Social Security payments are one key factor in many people's decisions about how long to work.

Work and Retirement in Late Adulthood

LO 18.7 Summarize the positives and negatives of retiring as an older adult.

"Don't forget your change, Mrs. Brody," Jim Hardy reminds his customer. "And enjoy your grandkids' visit." Hardy waves goodbye and the woman smiles as she waves back.

Jim Hardy turned 84 last month and he works 24 hours a week at the local supermarket. "I wasn't always a cashier," Hardy says. "I've done lots of work in my time. Started out on a logging operation, first in Vancouver, then up in Maine. But I got married and the missus wanted me to do something steady, so I got a job doing repairs for the telephone company. Worked that job for more than 40 years."

When Hardy's wife died five years ago, he thought about retiring and moving to Hawaii. "Beautiful country out there and the people are friendly." But Hardy didn't retire. He took the supermarket job instead.

"I like it here" he says. "I see folks. Talk to 'em. I'm not sure I'd know what to do if I wasn't working."

Deciding when to retire is a major decision faced by the majority of individuals in late adulthood. Some, like Jim Hardy, wish to work as long as they can. Others retire the moment their financial circumstances permit it.

When they do retire, many people experience a fair amount of difficulty in making the identity shift from "worker" to "retiree." They lack a professional title, they may no longer have people asking them for advice, and they can't say "I work for the Diamond Company."

For others, though, retirement represents a major opportunity, offering the chance to lead, perhaps for the first time in adulthood, a life of leisure. Because a significant number of people retire as early as age 55 or 60, and because people's life spans are expanding, many people spend far more time in retirement than in previous generations. Moreover, because the number of people in late adulthood continues to increase, retirees are an increasingly significant and influential segment of the U.S. population.

OLDER WORKERS: COMBATING AGE DISCRIMINATION. Many other people continue to work, either full or part time, for some part of late adulthood. That they can do so is largely because of legislation that was passed in the late 1970s, in which mandatory retirement ages were made illegal in almost every profession. Part of broader legislation that makes age discrimination illegal, these laws gave most workers the opportunity either to remain in jobs they held previously or to begin working in entirely different fields (Lindemann & Kadue, 2003; Lain, 2012).

Whether older adults continue to work because they enjoy the intellectual and social rewards that work provides or because they need to work for financial reasons, many encounter age discrimination. Age discrimination remains a reality despite laws making it illegal. Some employers encourage older workers to leave their jobs in order to replace them with younger employees whose salaries will be considerably lower. Furthermore, some employers believe that older workers are not up to the demands of the job or are less willing to adapt to a changing workplace—stereotypes about the elderly that are enduring, despite legislative changes.

There is little evidence to support the idea that older workers' ability to perform their jobs declines. In many fields, such as art, literature, science, politics, and even entertainment, it is easy to find examples of people who have made some of their greatest contributions during late adulthood. Even in those few professions that were specifically exempted from laws prohibiting mandatory retirement ages—those involving public safety—the evidence does not support the notion that workers should be retired at an arbitrary age.

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TRANSITIONING TO RETIREMENT: MARY AND GEORGE

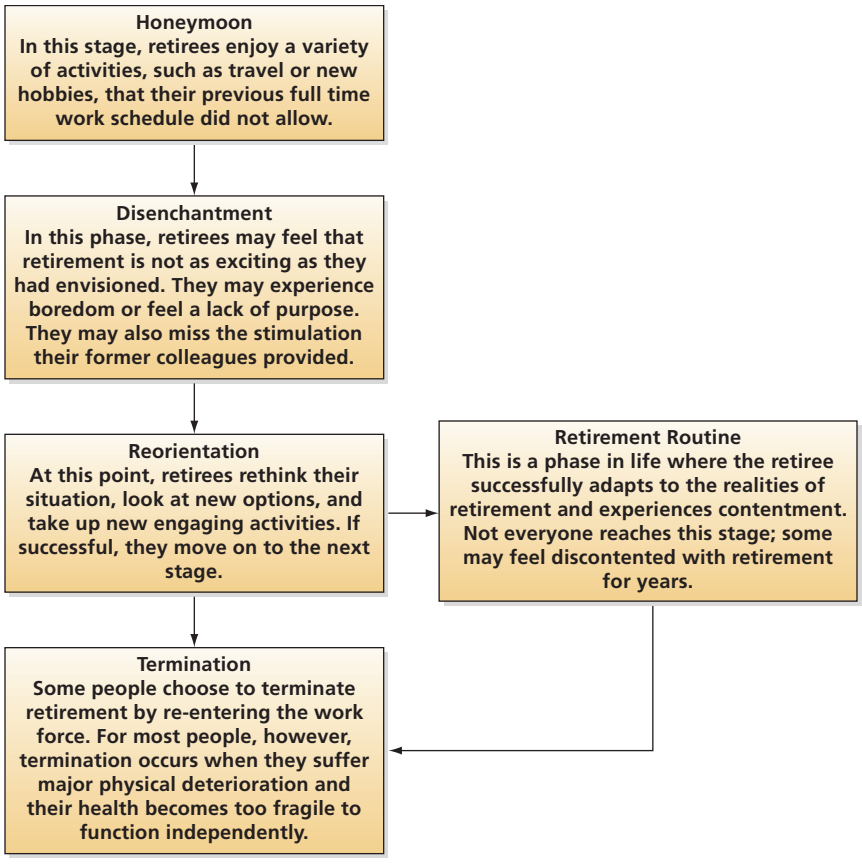
For instance, one large-scale, careful study of older police officers, firefighters, and prison guards came to the conclusion that age was not a good predictor of the general level of a worker's performance or whether he or she was likely to be incapacitated on the job. Instead, a case-by-case analysis of individual workers' performance was a more accurate predictor (Landy & Conte, 2004).

Although age discrimination remains a problem, market forces may help reduce its severity. As baby boomers retire and the workforce drastically shrinks, companies may begin to offer incentives to older adults to either remain in the workforce or to return to it after they have retired. Still, for most older adults, retirement is the norm.

RETIREMENT: FILLING A LIFE OF LEISURE. Why do people decide to retire? Although the basic reason seems apparent—to stop working—the retirement decision is actually based on a variety of factors. For instance, sometimes workers are burned out after a lifetime of work; they seek a respite from the tension and frustration of their jobs and from the sense that they are not accomplishing as much as they once wished they could. Others retire because their health has declined, and still others because they are offered incentives by their employers in the form of bonuses or increased pensions if they retire by a certain age. Finally, some people have planned for years to retire and intend to use their increased leisure to travel, study, or spend more time with their children and grandchildren (Nordenmark & Stattin, 2009; Petkoska & Earl, 2009; Müller, et al., 2014).

Whatever the reason they retire, people often pass through a series of retirement stages, summarized in Figure 18.3. Retirement may begin with a *honeymoon* period, in which former workers engage in a variety of activities, such as travel, that were previously

Figure 18.3 Stages of Retirement
(**Source:** Based on Atchley, 1982.)



Are You an Informed Consumer of Development?

Planning for—and Living—a Good Retirement

What makes for a good retirement? Gerontologists suggest that several factors are related to success (Rowe & Kahn, 1998; Noone, Stephens, & Alpass, 2009):

- Plan ahead financially. Because most financial experts suggest that Social Security pensions will be inadequate in the future, personal savings are critical. Similarly, having adequate health-care insurance is essential.
- Consider tapering off from work gradually. Sometimes it is possible to enter into retirement by shifting from full-time to part-time work. Such a transition may be helpful in preparing for eventual full-time retirement.
- Explore your interests before you retire. Assess what you like about your current job and think how that might be translated into leisure activities.
- If you are married or in a long-term partnership, spend some time discussing your views of the ideal retirement with your partner. You may find that you need to negotiate a vision that will suit you both.
- Consider where you want to live. Try out, temporarily, a community to which you are thinking of moving.
- Determine the advantages and disadvantages of downsizing your current home. You may need less space than you did earlier in life, and you might welcome fewer maintenance chores.
- Plan to volunteer your time. People who retire have an enormous wealth of skills, and these are often needed by nonprofit organizations and small businesses. Organizations such as the Retired Senior Volunteer Program and the Foster Grandparent Program can help match your skills with people who need them.

hindered by full-time work. The next phase may be *disenchantment*, in which retirees conclude that retirement is not all they thought it would be. They may miss the stimulation and companionship of their previous jobs, or they may find it hard to keep busy (Atchley & Barusch, 2005; Osborne, 2012; Schlosser, Zinni, & Armstrong-Stassen, 2012).

The next phase is *reorientation*, in which retirees reconsider their options and become engaged in new, more fulfilling activities. If successful, this leads to the *retirement routine* stage, in which they come to grips with the realities of retirement and feel fulfilled in this new phase of life. Not all people reach this stage; some may feel disenchanted with retirement for years.

Finally, the last phase of the retirement process is *termination*. Although some people terminate retirement by going back to work, termination for most people results from major physical deterioration. In this case, health becomes so bad that the person can no longer function independently. Obviously, not everyone passes through all these stages, and the sequence is not universal. In large measure, a person's reactions to retirement stem from the reasons he or she retired in the first place. For example, a person forced into retirement for health reasons will have a very different experience from a person who eagerly chose to retire at a particular age. Similarly, the retirement of people who loved their jobs may be a quite different experience from that of people who despised their work.

In short, the psychological consequences of retirement vary a great deal from one individual to the next. For many people, though, retirement is a continuation of a life well lived, and they use it to the fullest. Moreover, as we see in the *Are You an Informed Consumer of Development?* feature, one can do several things to plan a good retirement.

Module 18.2 Review

- Elderly people live in a variety of settings, although most live at home with a family member.
- Financial issues can trouble older people, largely because their incomes are fixed, health-care costs are increasing, and the life span is lengthening.
- People may pass through stages, including a honeymoon period, disenchantment, reorientation, retirement routine, and termination, as they adjust to retirement.

Journal Writing Prompt

Applying Lifespan Development: Based on the research on successful aging, what advice would you give someone who is nearing retirement?

Relationships: Old and New

Leonard Timbola, 94, describes how he met his wife, Ellen, 90.

"I was 23 when Pearl Harbor happened and I enlisted right away. I was sent to Fort Bragg and I was lonely. I'd often go into Fayetteville and just poke around. One day I was in a bookstore reaching for a book. You remember what it was?"

"Out of the Silent Planet," *Ellen says. "I happened to be reaching for it at the same time. Our hands met, and then our eyes."*

"And that was the end of my bachelorhood," says Leonard. "Fate sent me to that bookstore."

Ellen continues. "We shared that book and everything else from then on. We were married four months later."

"Just before I shipped out," says Leonard.

This is the way they are: He starts a thought, she finishes it. Unless it's the other way around.

"She wrote every day. I got her letters in bunches, and that was the best reading I ever did." He places his hand on Ellen's knee. Her hand joins his there.

"You weren't nearly as frequent a writer," she reminds him gently. "But when I did get one from you, I read it every day."

"Well that's the same thing," he laughs.

The warmth and affection between Leonard and Ellen are unmistakable. Their relationship, spanning eight decades, continues to bring them quiet joy, and their life is the sort to which many couples aspire. Yet it is also something of a rarity for those in the last stage of life. For every older person who is part of a couple, many more are alone.

What is the nature of the social world of people in late adulthood? To answer the question, we will first consider the nature of marriage in that period.

Marriage in the Later Years: In Sickness and in Health

LO 18.8 Describe how marriages fare in late adulthood.

It's a man's world—at least when it comes to marriage after the age of 65. The proportion of men who are married at this age is far greater than that of women (see Figure 18.4). One reason for this disparity is that 70 percent of women outlive their husbands by at least a few years. Because there are fewer men available (many have died), these women are unlikely to remarry.

Furthermore, the marriage gradient that we first discussed in Chapter 14 is still a powerful influence. Reflecting societal norms that suggest that women should marry men older than themselves, the marriage gradient works to keep women single even in the later years of life. At the same time, it makes remarriage for men much easier, since the available pool of eligible partners is much larger (Treas & Bengtson, 1987; AARP, 1990).

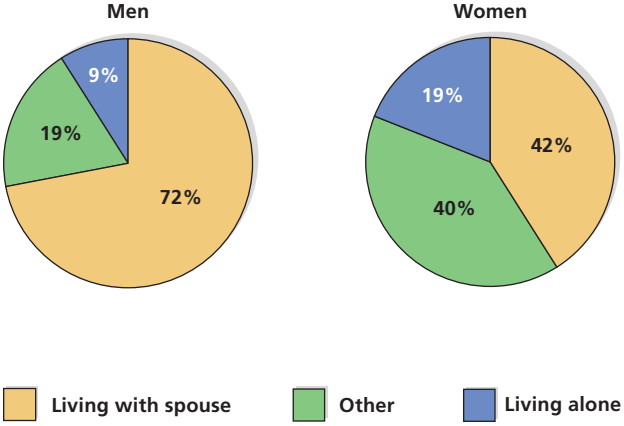
The vast majority of people who are still married in later life report that they are satisfied with their marriages. Their partners provide substantial companionship and emotional support. Because at this period in life they have typically been together for a long time, they have great insight into their partners (Jose & Alfons, 2007; Petrican, Moscovitch, & Grady, 2014).

At the same time, not every aspect of marriage is equally satisfying, and marriages may undergo severe stress as spouses experience changes in their lives. For instance, the retirement of one or both spouses can bring about a shift in the nature of a couple's relationship (Henry, Miller, & Giarrusso, 2005).

Figure 18.4 Living Patterns of Older Americans

What, if anything, do these patterns suggest about the relative health and adjustment of older men and women?

(**Source:** Administration on Aging, 2006.)



DIVORCE. For some couples, the stress is so great that one spouse or the other seeks a divorce. Some 15 percent of Americans over the age of 50 are divorced. The divorce rate has doubled since 1990 (Roberts, 2013).

The reasons for divorce at such a late stage of life are varied. Often, women who divorce do so because their husbands are abusive or alcoholic. But in the more frequent case of a husband seeking a divorce from his wife, the reason is often that he has found a younger woman. Often the divorce occurs soon after retirement, when men who have been highly involved in their careers are in psychological turmoil (Solomon et al., 1998).

Divorce so late in life is particularly difficult for women. Between the marriage gradient and the limited size of the potential pool of eligible men, it is unlikely that an older divorced woman will remarry. Divorce in late adulthood can be devastating. For many women, marriage has been their primary role and the center of their identities, and they may view divorce as a major failure. As a consequence, happiness and the quality of life for divorced women often plummet (Goldscheider, 1994; Davies & Denton, 2002).

Seeking a new relationship becomes a priority for many men and women who are divorced or whose spouses have died. As in earlier stages of life, people seeking to develop relationships use a variety of strategies to meet potential partners, such as joining singles organizations or using the Internet to seek out companionship (Durbin, 2003; Dupuis, 2009).

It is important to keep in mind that some people enter late adulthood having never married. For those who have remained single throughout their lives—about 5 percent of the population—late adulthood may bring fewer transitions, since the status of living alone does not change. In fact, never-married individuals report feeling less lonely than do most people their age, and they have a greater sense of independence (Newton & Keith, 1997).

DEALING WITH RETIREMENT: TOO MUCH TOGETHERNESS?

> *When Morris Abercrombie finally stopped working full time, his wife, Roxanne, found some aspects of his increased presence at home troubling. Although their marriage was strong, his intrusion into her daily routine and his constant questioning about whom she was on the phone with and where she was going when she went out were irksome. Finally, she began to wish he would spend less time around the house. It was an ironic thought: She had passed much of Morris's preretirement years wishing that he would spend more time at home.*

The situation in which Morris and Roxanne found themselves is not unique. For many couples, retirement means that relationships need to be renegotiated. In some cases, retirement results in a couple's spending more time together than at any other point in their marriage. In others, retirement alters the long-standing distribution of household chores, with men taking on more responsibility than before for the everyday functioning of the household.

Research suggests that an interesting role reversal often takes place. In contrast to the early years of marriage, when wives, more than husbands, typically desire greater companionship with their spouses, in late adulthood husbands' companionship needs tend to be greater than their wives'. The power structure of marriage also changes: Men become more affiliative and less competitive following retirement. At the same time, women become more assertive and autonomous (Kulik, 2002).

CARING FOR AN AGING SPOUSE. The shifts in health that accompany late adulthood sometimes require women and men to care for their spouses in ways that they never envisioned. Consider, for example, one woman's comments of frustration:

> *I cry a lot because I never thought it would be this way. I didn't expect to be mopping up the bathroom, changing him, doing laundry all the time. I was taking care of babies at twenty; now I'm taking care of my husband. (Doress et al., 1987, pp. 199–200)*

At the same time, some people view caring for an ailing and dying spouse in a more positive light, regarding it in part as a final opportunity to demonstrate love and devotion.

One of the most difficult responsibilities of later adulthood can be caring for one's ill spouse.

Some caregivers report feeling quite satisfied as a result of fulfilling what they see as their responsibility to their spouse. And some of those who experience emotional distress initially find that the distress declines as they successfully adapt to the stress of caregiving.

Yet even if giving care is viewed in such a light, without doubt it is an arduous chore, made more difficult by the fact that the spouses providing the care are probably not in the peak of physical health themselves. Caregiving may indeed be detrimental to the provider's own physical and psychological health. For instance, caregivers report lower levels of satisfaction with life than do noncaregivers (Choi & Marks, 2006; Mausbach et al., 2012; Davis et al., 2014).

In most cases, it should be noted, the spouse who provides the care is the wife. Just under three-quarters of people who provide care to a spouse are women. Part of the reason is demographic: Men tend to die earlier than women, and consequently they contract the diseases leading to death earlier than women. A second reason relates to society's traditional gender roles, which view women as "natural" caregivers. As a consequence, health-care providers may be more likely to suggest that a wife cares for her husband than that a husband cares for his wife.

The Death of a Spouse: Becoming Widowed

LO 18.9 Describe the typical reactions to the death of a spouse during late adulthood.

Hardly any event is more painful and stressful than the death of one's spouse. Especially for those who married young, the death of a spouse leads to profound feelings of loss and often brings about drastic changes in economic and social circumstances. If the marriage has been a good one, the death of the partner means the loss of a companion, a lover, a confidante, a helper.

Upon a partner's death, spouses suddenly assume a new and unfamiliar societal role: widowhood. At the same time, they lose the role with which they were most familiar: spouse. Abruptly, widowed people are no longer part of a couple; instead they are viewed by society, and themselves, solely as individuals. All this occurs as they are dealing with profound and sometimes overwhelming grief.

Widowhood brings a variety of new demands and concerns. There is no longer a companion with whom to share the day's events. If the deceased spouse primarily carried out household chores, the surviving spouse must learn how to do these tasks and must perform them every day. Although initially family and friends provide a great deal of support, this assistance quickly fades into the background, and newly widowed people are left to make the adjustment to being single on their own (Hanson & Hayslip, 2000; Smith, J. M., 2012).

People's social lives often change drastically following the death of a spouse. Married couples tend to socialize with other married couples; widowed individuals may feel like "fifth wheels" as they seek to maintain the friendships they enjoyed as a member of a couple. Eventually, such friendships may cease, although they may be replaced by friendships with other single people (Fry & Debats, 2010).

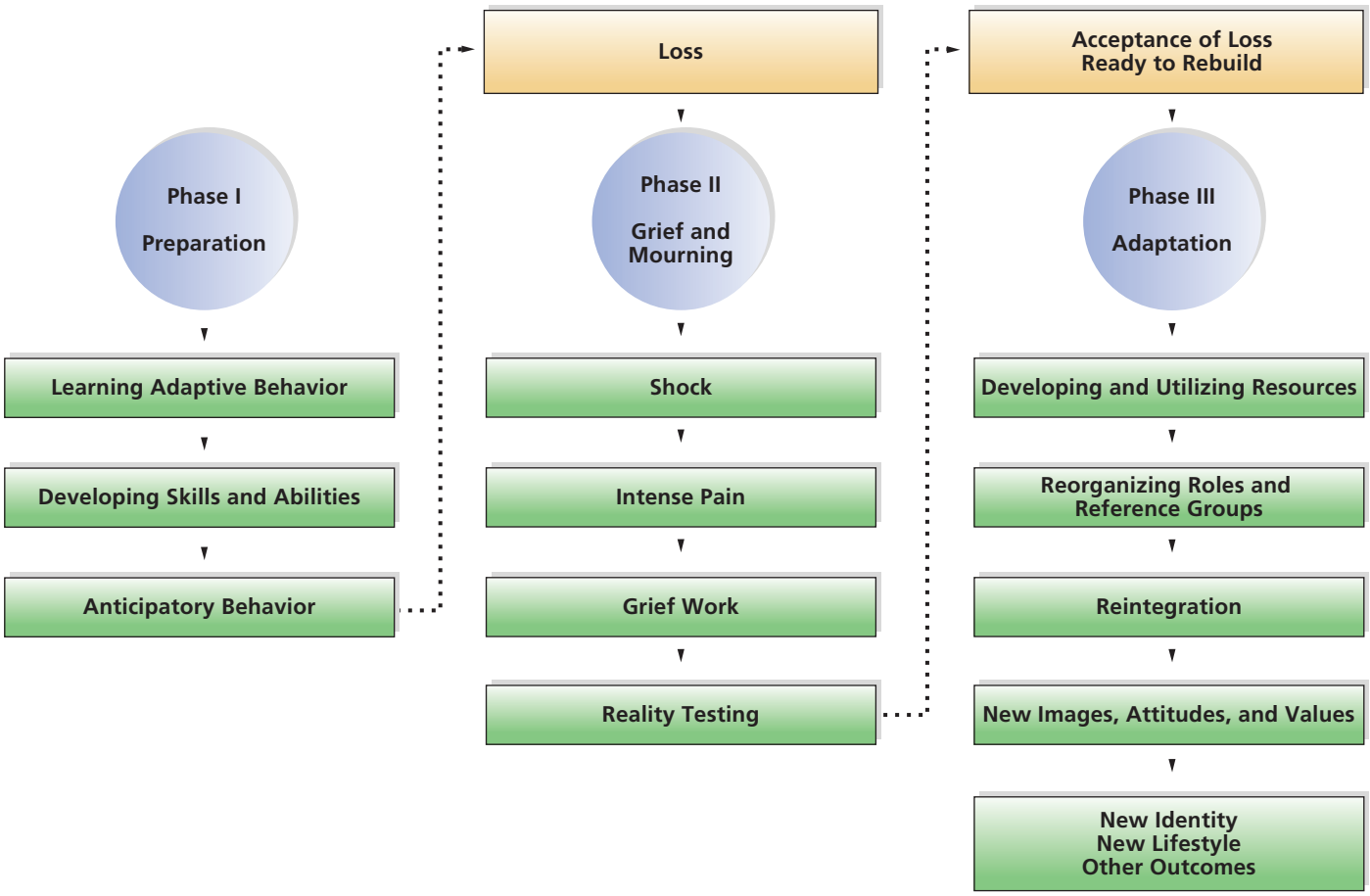
Economic issues are of major concern to many widowed people. Although many have insurance, savings, and pensions to provide economic security, some individuals, most often women, experience a decline in their economic well-being as the result of a spouse's death, as noted earlier in this chapter. In such cases, the change in financial status can force distressing decisions, such as selling the house in which the couple spent their entire married lives (Meyer, Wolf, & Himes, 2006).

The process of adjusting to widowhood encompasses three stages (see Figure 18.5). In the first stage, *preparation*, spouses prepare, in some cases years and even decades ahead of time, for the eventual death of the partner. Consider, for instance, the purchase of life insurance, the preparation of a will, and the decision to have children, who may eventually provide care in one's old age. Each of these actions helps prepare for the eventuality that one will be widowed and will require some degree of assistance (Roecke & Cherry, 2002).

Figure 18.5 The Process of Adjustment to Widowhood

Do you think the process of adjustment is identical for men and women?

(**Source:** Based on Heinemann & Evans, 1990.)



The second stage of adjustment to widowhood, *grief and mourning*, is an immediate reaction to the death of a spouse. It starts with the shock and pain of loss and continues as the survivor works through the period of emotions the loss brings up. The length of time a person spends in this period depends on the degree of support received from others, as well as on personality factors. In some cases, the grief and mourning period may last for years, while in others it lasts a few months.

The last stage of adjustment to the death of a spouse is *adaptation*. In adaptation, the widowed individual starts a new life. The period begins with the acceptance of one's loss and continues with the reorganization of roles and the formation of new friendships. The adaptation stage also encompasses a period of reintegration in which a new identity—as an unmarried person—is developed.

It is important to keep in mind that this three-stage model of loss and change does not apply to everyone, and the timing of the stages varies considerably. Moreover, some people experience *complicated grief*, a form of unrelenting mourning that continues sometimes for months and even years. In complicated grief, people find it difficult to let go of a loved one, and they have intrusive memories of the deceased that impede normal functioning (Holland et al., 2009; Piper et al., 2009; Zisook & Shear, 2009).

From *a social worker's* perspective

What are some factors that can combine to make older adulthood a more difficult time for women than for men?

For most people, though, life returns to normal and becomes enjoyable once again after the death of a spouse. Still, the death of a spouse is a profound event in any period of life. During late adulthood, its implications are particularly powerful, since it can be seen as a forewarning of one's own mortality.

The Social Networks of Late Adulthood

LO 18.10 Discuss the nature of relationships in late adulthood.

Elderly people enjoy friends as much as younger people do, and friendships play an important role in the lives of those in late adulthood. Time spent with friends is often valued more highly during late adulthood than time spent with family, and friends are often seen as more important providers of support than family members. Furthermore, around a third of older persons report that they made a new friend within the past year, and many older adults engage in significant interaction (see Figure 18.6; Ansberry, 1997).

WATCH THIS VIDEO ON MYPSYCHLAB

GRIEVING A LOSS PART 2: BOB, 81 YEARS OLD

FRIENDSHIP: WHY FRIENDS MATTER IN LATE ADULTHOOD. One reason for the importance of friendship relates to the element of control. In friendship relationships, unlike family relationships, we choose whom we like and whom we dislike, meaning that we have considerable control. Because late adulthood may bring with it a gradual loss of control in other areas, such as in one's health, the ability to maintain friendships may take on more importance than in other stages of life (Pruchno & Rosenbaum, 2003; Stevens, Martina, & Westerhof, 2006; Singh & Srivastava, 2014).

In addition, friendships—especially ones that have developed recently—may be more flexible than family ties, given that recent friendships are not likely to have a history of obligations and past conflicts. In contrast, family ties may have a long and sometimes stormy record that can reduce the emotional sustenance they provide (Monsour, 2002; Lester et al., 2012).

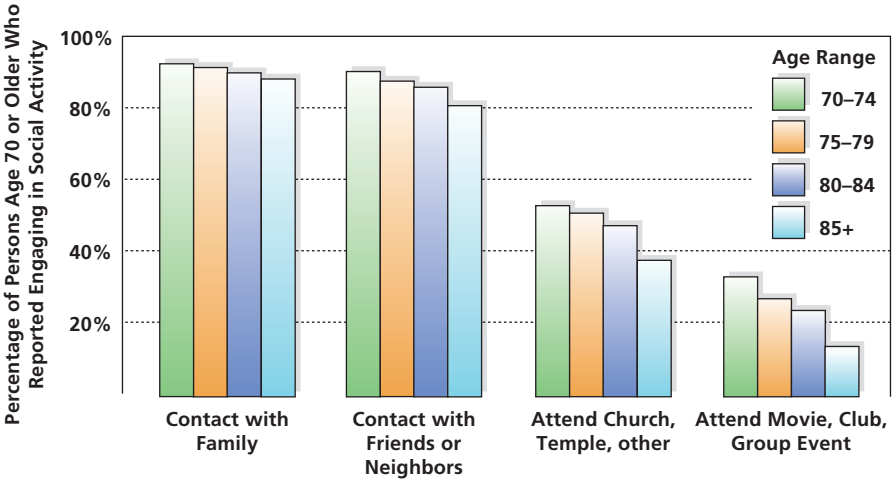
Another reason for the importance of friendships in late adulthood relates to the increasing likelihood, over time, that one will be without a marital partner. When a spouse dies, people typically seek out the companionship of friends to help deal with their loss and also for some of the companionship that was provided by the deceased spouse.

Of course, it isn't only spouses who die during old age; friends die too. The way adults view friendship in late adulthood determines how vulnerable they are to the death of a friend. If the friendship has been defined as irreplaceable, then the loss of the friend may be quite difficult. On the other hand, if the friendship is defined as one of

Figure 18.6 Social Activity in Late Adulthood

Friends and family play an important role in the social activities of the elderly.

(**Source:** Federal Interagency Forum on Age Related Statistics, 2000.)



many friendships, then the death of a friend may be less traumatic. In such cases, older adults are more likely to become involved subsequently with new friends.

SOCIAL SUPPORT: THE SIGNIFICANCE OF OTHERS. Friendships also provide one of the basic social needs: social support. **Social support** is assistance and comfort supplied by a network of caring, interested people. Such support plays a critical role in successful aging (Avlund, Lund, & Holstein, 2004; Gow et al., 2007; Evans, 2009; Li, Xu, & Li, 2014).

social support
assistance and comfort supplied by a network of caring, interested people

The benefits of social support are considerable. For instance, people can provide emotional support by lending a sympathetic ear and providing a sounding board for one's concerns. Furthermore, social support from people who are experiencing similar problems—such as the loss of a spouse—can provide an unmatched degree of understanding and a pool of helpful suggestions for coping strategies that would be less credible coming from others.

Finally, people can furnish material support, such as helping with rides or picking up groceries. They can provide help in solving problems, such as dealing with a difficult landlord or fixing a broken appliance.

The benefits of social support extend not only to the recipient of the support but also to the provider. People who offer support experience feelings of usefulness and heightened self-esteem, knowing that they are making a contribution to others' welfare.

What kinds of social support are most effective and appropriate? It can vary from preparing food, accompanying someone to a movie, or inviting someone to dinner. But the opportunity for reciprocity is important, too. Reciprocity is the expectation that if someone provides something positive to another person, eventually, the favor will be returned. In Western societies, older adults—like younger people—value _relationships in which reciprocity is possible (Becker, Beyene, & Newsom, 2003).

With increasing age, it may be progressively more difficult to reciprocate the social support that one receives. As a consequence, relationships may become more asymmetrical, placing the recipient in a difficult psychological position.

WATCH THIS VIDEO ON MYPSYCHLAB
LATE ADULTHOOD: HAPPINESS, MOLLY

Family Relationships: The Ties That Bind

LO 18.11 Explain how aging affects family relationships.

Even after the death of a spouse, most older adults are part of a larger family unit. Connections with siblings, children, grandchildren, and even great-grandchildren continue, and they may provide an important source of comfort to adults in the last years of their lives.

Siblings may provide unusually strong emotional support during late adulthood. Because they often share old, pleasant memories of childhood, and because they usually represent the oldest existing relationships a person has, siblings can provide important support. While not every memory of childhood may be happy, continuing interaction with brothers and sisters still provides substantial emotional support during late adulthood.

CHILDREN. Even more important than siblings are children and grandchildren. Even in an age in which geographic mobility is high, most parents and children remain fairly close, both geographically and psychologically. Some 75 percent of children live within a 30-minute drive of their parents, and parents and children visit and talk with one another frequently. Daughters tend to be in more frequent contact with their parents than sons, and mothers tend to receive more communication more frequently than fathers (Ji-liang, Li-qing, & Yan, 2003; Diamond, Fagundes, & Butterworth, 2010; Byrd-Craven et al., 2012).

Because the great majority of older adults have at least one child who lives fairly close by, family members still provide significant aid to one another. Moreover, parents and children tend to share similar views of how adult children should behave toward their parents (see Table 18-1). In particular, they expect that children should help their parents understand their resources, provide emotional support, and talk over matters of

Table 18-1 Views of Parents and Children Regarding Behavior of Adult Children toward Parents

Rank	Children's Ranking	Parent's Ranking
1	Help understand resources	Discuss matters of importance
2	Give emotional support	Help understand resources
3	Discuss matters of importance	Give emotional support
4	Make room in home in emergency	Give parents advice
5	Sacrifice personal freedom	Be together on special occasions
6	Care when sick	Sacrifice personal freedom
7	Be together on special occasions	Make room in home in emergency
8	Provide financial help	Feel responsible for parent
9	Give parents advice	Care when sick
10	Adjust family schedule to help	Adjust family schedule to help
11	Feel responsible for parent	Visit once a week
12	Adjust work schedule to help	Adjust work schedule to help
13	Believe that parent should live with child	Provide financial help
14	Visit once a week	Write once a week
15	Live close to parent	Believe that parent should live with child
16	Write once a week	Live close to parent

(**Source:** Based on Hamon & Blieszner, 1990.).

importance, such as medical issues. Furthermore, it is most often children who end up caring for their aging parents when they require assistance (Dellmann-Jenkins & Brittain, 2003; Ron, 2006; Funk, 2010).

The bonds between parents and children are sometimes asymmetrical, with parents seeking a closer relationship and children a more distant one. Parents have a greater *developmental stake* in close ties, since they see their children as perpetuating their beliefs, values, and standards. On the other hand, children are motivated to maintain their autonomy and live independently from their parents. These divergent perspectives make parents more likely to minimize conflicts they experience with their children, and children more likely to maximize them.

For parents, their children remain a source of great interest and concern. Some surveys show, for instance, that even in late adulthood parents talk about their children nearly every day, particularly if the children are having some sort of problem. At the same time, children may turn to their elderly parents for advice, information, and sometimes tangible help, such as money (Diamond, Fagundes, & Butterworth, 2010).

GRANDCHILDREN AND GREAT-GRANDCHILDREN. As we discussed first in Chapter 16, not all grandparents are equally involved with their grandchildren. Even those grandparents who take great pride in their grandchildren may be relatively detached from them, avoiding any direct care role. On the other hand, many grandparents include their grandchildren as an integral part of their social networks (Coall & Hertwig, 2010, 2011; Geurts, van Tilburg, & Poortman, 2012).

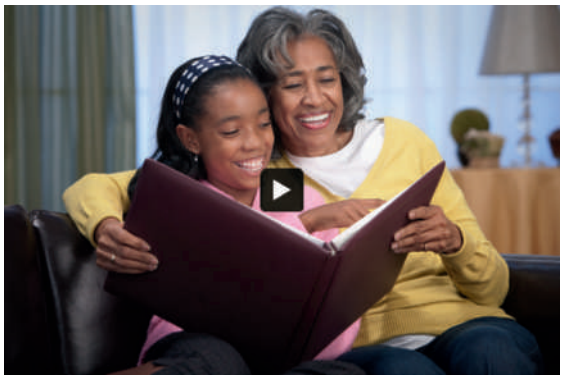
As we saw, grandmothers tend to be more involved with their grandchildren than grandfathers; similarly, there are gender differences in the feelings grandchildren have toward their grandparents. Specifically, most young adult grandchildren feel closer to their grandmothers than to their grandfathers. In addition, most express a preference for their maternal grandmothers over their paternal grandmothers (Hayslip, Shore, & Henderson, 2000; Lavers-Preston & Sonuga-Barke, 2003; Bishop et al., 2009).

African American grandparents tend to be more involved with their grandchildren than white grandparents, and African American grandchildren often feel closer to their grandparents. Moreover, grandfathers seem to play a more central role in the lives of African American children than in the lives of white children. The reason for these racial

differences probably stems in large measure from the higher proportion of multigenerational families among African Americans than among whites. In such families, grandparents usually play a central role in childrearing (Crowther & Rodriguez, 2003; Stevenson, Henderson, & Baugh, 2007; Gelman et al., 2014).

Great-grandchildren play less of a role in the lives of both white and African American great-grandparents. Most great-grandparents do not have close relationships with their great-grandchildren. Close relationships tend to occur only when the great-grandparents and great-grandchildren live relatively near one another (McConnell, 2012).

WATCH THIS VIDEO ON MYPSYCHLAB
SUCCESSFUL AGING: EXTENDED FAMILY: MARIA, 68 YEARS OLD



There are several explanations for the relative lack of involvement of great-grandparents with great-grandchildren. One is that by the time they reach great-grandparenthood, older adults are so old that they do not have much physical or psychological energy to expend on forming relationships with their great-grandchildren. Another is that there may be so many great-grandchildren that great-grandparents do not feel strong emotional ties to them. It is not uncommon for a great-grandparent who has had a large number of children to have so many great-grandchildren that they are difficult to keep track of.

Still, even though most great-grandparents may not have close relationships with their great-grandchildren, they profit emotionally from the mere fact that they have great-grandchildren. For instance, great-grandparents may see their great-grandchildren as representing both their own and their family's continuation, as well as providing a concrete sign of their longevity. Furthermore, as health advances in late adulthood continue to increase, great-grandparents are physically able to contribute more to the lives of their great-grandchildren (McConnell, 2012).

Elder Abuse: Relationships Gone Wrong

LO 18.12 Discuss what causes elder abuse and how it can be prevented.

When Lorene Templeton was 74, her son Aaron moved in with her. "I was lonely and welcomed the company. When Aaron offered to take care of my finances, I gave him my power of attorney."

For the next three years, Aaron cashed Lorene's checks, withdrew her money, and used her credit card. "When I found out, Aaron apologized. He said he needed the money to get out of trouble. He promised to stop."

But he didn't. Aaron emptied Lorene's accounts and then demanded the key to her safe deposit box. When she refused, he beat her until she lost consciousness.

"His problem was drugs," Lorene says. "Finally, I called the police and they arrested him. Now I feel free for the first time in years."

It would be easy to assume that such cases are rare. The truth of the matter, however, is that they are considerably more common than we would like to believe. According to some estimates, **elder abuse**, the physical or psychological mistreatment or neglect of elderly individuals, had been experienced by as many as 11 percent of the elderly consulted during the previous year. Even these estimates may be too low, since people who are abused are often too embarrassed or humiliated to report their plight. And as the number of elderly people increases, experts believe that the number of cases of elder abuse will also rise (Acierno et al., 2010; Dow & Joosten, 2012).

elder abuse
the physical or psychological mistreatment or neglect of elderly individuals

Elder abuse is most frequently directed at family members and particularly at elderly parents. Those most at risk are likely to be less healthy and more isolated than the average person in late adulthood, and they are more likely to be living in a caregiver's home. Although there is no single cause for elder abuse, it often is the result of a combination of economic, psychological, and social pressures on caregivers who must provide high levels of care 24 hours a day. Thus, people with Alzheimer's disease or other sorts of dementia are particularly likely to be targets of abuse (Tauriac & Scruggs, 2006; Baker, 2007; Lee, 2008).

The best approach to dealing with elder abuse is to prevent it from occurring in the first place. Family members caring for an older adult should take occasional breaks. Social support agencies can be contacted; they can provide advice and concrete support. For instance, the National Family Caregivers Association (800-896-3650) maintains a caregivers' network and publishes a newsletter. Anyone suspecting that an elderly person is being abused should contact local authorities, such as their state's Adult Protective Services or Elder Protective Services.

Module 18.3 Review

- While marriages in older adulthood are generally happy, stresses due to aging can bring divorce. Retirement often requires a reworking of power relationships within the marriage.
- The death of a spouse brings highly significant psychological, social, and material changes to the survivor.
- Friendships are very important in later life, providing social support and companionship from peers who are likely to understand the older adult's feelings and problems.
- Family relationships are a continuing part of most older people's lives, especially relationships with siblings and children.
- Elder abuse typically involves a socially isolated elderly parent in poor health and a caregiver who feels burdened by the parent. The best way to prevent abuse is to provide relief for the caregiver in the form of breaks and social support.

Journal Writing Prompt

Applying Lifespan Development: What are some ways the retirement of a spouse can bring stress to a marriage? Is retirement likely to be less stressful in households where both spouses work, or twice as stressful?

Epilogue

Social and personality development continues in the last years of life. In this chapter, we focused on the question of change versus stability in personality and the sorts of life events that can affect personality development. We debunked a few stereotypes as we looked at the ways older people live and at the effects of retirement. Relationships, especially marital and family relationships but also friendships and social networks, are important to the well-being of older adults. We closed the chapter with a look at the troubling phenomenon of elder abuse.

Turn back to the prologue of this chapter, about Simone Thomas, the widowed children's book illustrator, and answer the following questions.

1. How does Simone employ selective optimization in her life?
2. Think of Simone's life in terms of age stratification theories. Do you think she feels a loss of status? Why or why not?
3. How do you think Simone's priorities have changed since she was 20? In what ways might this have affected her personality?
4. How do you think having Simone's brother move in with her might benefit them both? Do you think there are any drawbacks to this arrangement for her?

Looking Back

LO 18.1 Describe ways in which personality develops during late adulthood.

In Erikson's ego-integrity-versus-despair stage of psychosocial development, as people reflect on their lives, they may feel either satisfaction, which leads to integration, or dissatisfaction, which can lead to despair and a lack of integration. Robert Peck identifies the three main tasks of this period as redefinition of self versus preoccupation with work role, body transcendence versus body preoccupation, and ego transcendence versus ego preoccupation Daniel Levinson identifies a transitional stage that people pass through on the way to late adulthood, during which they struggle with being "old" and with societal stereotypes. A successful transition can lead to liberation and self-respect. Bernice Neugarten identified four personality types according to the way they cope with aging: disintegrated and disorganized, passive-dependent, defended, and integrated. Life review, a common theme of developmental theories of late adulthood, can help people resolve past conflicts and achieve wisdom and serenity, but some people become obsessive about past errors and slights.

LO 18.2 Explain how age relates to the distribution of resources, power, and privilege.

Age stratification theories suggest that the unequal distribution of economic resources, power, and privilege is particularly pronounced during late adulthood. In general, Western societies do not hold elderly people in as high esteem as many Asian societies.

LO 18.3 Define wisdom and describe how it is correlated with age.

Wisdom reflects the accumulation of knowledge related to human behavior. Because it is gathered through experience, it appears to be correlated with age.

LO 18.4 Differentiate the theories of aging.

Disengagement theory and activity theory present opposite views of ways to deal successfully with aging. People's choices depend partly on their prior habits and personalities. The model of selective optimization with compensation involves focusing on personally important areas of functioning and compensating for ability losses in those areas.

LO 18.5 Describe the circumstances in which older people live and the difficulties they face.

Living arrangement options include staying at home, living with family members, participating in adult day care, residing in continuing-care communities, and living in skilled-nursing facilities.

LO 18.6 Discuss how financially secure older people are in the United States today.

Elderly people may become financially vulnerable because they must cope with rising health-care expenses and other costs on a fixed income.

LO 18.7 Summarize the positives and negatives of retiring as well as typical stages retired people pass through.

People who retire must fill an increasingly longer span of leisure time. Those who are most successful plan ahead and have varied interests. People who retire often pass through stages, including a honeymoon period, disenchantment, reorientation, a retirement routine stage, and termination.

LO 18.8 Describe how marriages fare in late adulthood.

Marriages in later life generally remain happy, although stresses brought about by major life changes that accompany aging can cause rifts. Divorce is usually harder on the woman than the man, partly because of the continuing influence of the marriage gradient. Deterioration in the health of a spouse can cause the other spouse—typically the wife—to become a caregiver, which can bring both challenges and rewards.

LO 18.9 Describe the typical reactions to the death of a spouse during late adulthood.

The death of a spouse forces the survivor to assume a new societal role, accommodate to the absence of a companion and chore-sharer, create a new social life, and resolve financial problems. Sociologists Gloria Heinemann and Patricia Evans have identified three stages in adjusting to widowhood: preparation, grief and mourning, and adaptation. Some people never reach the adaptation stage.

LO 18.10 Discuss the nature of relationships in late adulthood.

Friendships are important in later life because they offer personal control, companionship, and social support.

LO 18.11 Explain how aging affects family relationships.

Family relationships, especially with siblings and children, provide a great deal of emotional support for people in later life.

LO 18.12 Discuss what causes elder abuse and how it can be prevented.

In the increasingly prevalent phenomenon of elder abuse, parents who are socially isolated and in poor health may be abused by children who are forced to act as caregivers. The best defense against elder abuse is prevention by ensuring that caregivers receive time off and have access to social support.

Key Terms and Concepts

SUMMARY

8 Putting It All Together

Late Adulthood

ARTHUR WINSTON AND BEN TUFTY have chosen two distinct ways to live out their late adulthood. While Arthur loves his job and can't conceive of retiring, Ben couldn't wait to retire and now enjoys his leisure to the fullest. What the two retirees have in common is their commitment to maintaining their physical health, intellectual activity, and key relationships—even if they have chosen radically different ways to do these things. By paying attention to their needs in all three spheres, Arthur and Ben have remained optimistic and cheerful. Clearly, each looks forward to every day he spends in the world.

WHAT WOULD YOU DO?

■ If you were asked to do an oral history project involving Arthur and Ben, how complete and accurate would you expect their recollections to be? Would they be more reliable about the 1950s or the 1990s? Which man do you think you would enjoy talking to more?

What's your response?

WHAT WOULD A RETIREMENT COUNSELOR DO?

■ What advice would you give a person who wants to stay on the job forever, the way Arthur has done? What advice would you give someone like Ben, who wants to retire early? What characteristics would you look for in these individuals that would help you give the right advice?

What's your response?

Physical Development

- Though both are chronologically among the "oldest old," Arthur and Ben are "young old" in their functional ages.
- Both defy ageist stereotypes in their health and attitudes.
- Both appear to have avoided Alzheimer's and most of the other physical and psychological disorders associated with old age.
- Arthur and Ben have made healthy lifestyle choices—exercising, eating right, and avoiding bad habits.

Cognitive Development

- Both Arthur and Ben are apparently rich in crystallized intelligence—their store of information, skills, and strategies.
- They demonstrate plasticity by using stimulation, practice, and motivation to maintain their mental abilities.
- Both men may have slight memory problems, such as a decline in episodic or autobiographical memory.

Social and Personality Development

- Arthur and Ben are navigating Erikson's ego-integrity-versus-despair stage, but they seem to have chosen different answers to Peck's developmental task of redefinition of self versus preoccupation with work role.
- The two appear to be coping with aging differently, according to Neugarten's personality categories.
- Both seem to have acquired wisdom with age, knowing who they are and how to deal with others.
- In playing low-pressure games, Ben might be engaging in compensation for slowed reaction time or less-than-perfect recall.
- Both men have chosen to continue living at home.
- Neither man seems to have gone through the classic retirement stages.

WHAT WOULD A HEALTH-CARE PROVIDER DO?

■ Why do you think Arthur and Ben are in such good mental health? What strategies has Arthur used that Ben may not have? What strategies has Arthur used that Ben may not have? What strategies do they share?

What's your response?

WHAT WOULD AN EDUCATOR DO?

■ Would you recommend cognitive training for either Arthur or Ben? What about college courses via Elderhostel or online? Why or why not?

What's your response?

Chapter 19
Death and Dying

Learning Objectives

LO 19.1 Review the difficulties in defining death.

LO 19.2 Describe what death means at different stages of the life span.

LO 19.3 Describe how dying is affected by culture.

LO 19.4 Summarize how we can prepare for death.

LO 19.5 Describe ways in which people face the prospect of their own death.

LO 19.6 Describe ways in which people exercise control over the death decision.

LO 19.7 Compare and contrast the advantages of hospice and home care for the end of life.

LO 19.8 Describe how survivors react to and cope with death.

LO 19.9 Describe ways in which people experience grief and the functions it serves.

Chapter Overview

Prologue: Feel Like a Dinosaur

When Jules Beckham turned 100 last October, his family threw him a big party. "My kids, grandkids, great-grandkids all came," he recalls. "We were 40 in all, and two of my great-granddaughters are pregnant." Missing from the celebration were Jules's eldest son, who died of cancer five years ago, and a granddaughter who was killed in a car accident. Absent, too, were his former colleagues from the high school where he taught English for 40 years. They're all dead now. The same is true of the men he fought beside in the Pacific in World War II. Even the friends he played chess with after retirement are all gone. "I'm the last man standing," he says. "I love my family dearly, but they've heard my reminiscences a hundred times, and they don't get my references to anything that happened before 1960."

Jules has drawn up a living will and shared it with his eldest daughter and his doctors. "It's funny," he says. "When I was facing enemy fire in the war, I had to battle with the fear of dying every day, but now I'm calmer. I don't want to die, but I feel a bit like a dinosaur, and I don't want my life prolonged if I have severe brain damage or am paralyzed. If 100 years has taught me anything, it's that quality of life is much more valuable than quantity." ■

Looking Ahead

Even if we reach 100 years, death is an experience that will happen to all of us at some time, as universal to the human condition as birth. As such, it is a milestone of life that is central to an understanding of the life span.

Only in the past several decades have lifespan developmentalists given serious study to the developmental implications of dying. In this chapter, we discuss death and dying from several perspectives. We begin by considering how we define death—a determination that is more complex than it seems. We then examine how people view and react to death at different points in the life span. We also consider the very different views of death held by various societies.

Next, we look at how people confront their own deaths. We discuss one theory that people move through several stages as they come to grips with their approaching death. We also look at how people use living wills and assisted suicide.

Quality of life becomes an increasingly important issue as people reach the end of the life span.

Finally, we consider bereavement and grief. We examine the difficulties in distinguishing normal from unhealthy grief, and we discuss the consequences of a loss. The chapter also looks at mourning and funerals, discussing how people can prepare themselves for the inevitability of death.

Dying and Death across the Life Span

It took a major legal and political battle, but eventually Terri Schiavo's husband won the right to remove a feeding tube that had been keeping her alive for 15 years. Lying in a hospital bed all those years in what physicians called a "persistent vegetative state," Schiavo was never expected to regain consciousness after suffering brain damage due to respiratory and cardiac arrest. After a series of court battles, her husband—despite the wishes of her parents—was allowed to direct caretakers to remove the feeding tube; Schiavo died soon afterward.

Was Schiavo's husband right in seeking to remove her feeding tube? Was she already dead when it was removed? Were her constitutional rights unfairly ignored by her husband's action?

The difficulty of answering such questions illustrates the complexity of what are, literally, matters of life and death. Death is not only a biological event; it involves psychological aspects as well. We need to consider not only issues relating to the definition of death but also the ways in which our conception of death changes across various points in the life span.

Defining Death: Determining the Point at Which Life Ends

LO 19.1 Review the difficulties in defining death.

What is death? Although the question seems straightforward, defining the point at which life ceases and death occurs is surprisingly complex. Over the last few decades, medicine has advanced to the point where some people who would have been considered dead a few years ago would now be considered alive.

functional death
the absence of a heartbeat and breathing

Functional death is defined by an absence of heartbeat and breathing. Although this definition seems unambiguous, it is not completely straightforward. For example, a person whose heart has stopped beating and whose breathing has ceased for as long as five minutes may be resuscitated and suffer little damage as a consequence of the experience. Does this mean that the person who is now alive was dead, as the functional definition would have it?

brain death
a diagnosis of death based on the cessation of all signs of brain activity, as measured by electrical brain waves

Because of this imprecision, heartbeat and respiration are no longer used to determine the moment of death. Medical experts now measure brain functioning. In **brain death**, all signs of brain activity, as measured by electrical brain waves, have ceased. When brain death occurs, there is no possibility of restoring brain functioning.

Some medical experts suggest that a definition of death that relies only on a lack of brain waves is too restrictive. They argue that losing the ability to think, reason, feel, and experience the world may be sufficient to declare a person dead. In this view, which takes psychological considerations into account, a person who suffers irreversible brain damage, who is in a coma, and who will never experience anything approaching a human life can be considered dead. In such a case, the argument goes, death can be judged to have arrived, even if some sort of primitive brain activity is still occurring (Ressner, 2001; Burkle, Sharp, & Wijdicks, 2014).

Not surprisingly, such an argument, which moves us from strictly medical criteria to moral and philosophical considerations, is controversial. As a result, the legal definition of death in most localities in the United States relies on the absence of brain functioning, although some laws still include a definition relating to the absence of respiration and heartbeat. The reality is that no matter where a death occurs, in most cases people do not bother to measure brain waves. Usually, the brain waves are closely monitored only in certain circumstances—when the time of death is significant, when organs may potentially be transplanted, or when criminal or legal issues might be involved.

The difficulty in establishing legal and medical definitions of death may reflect some of the changes in understanding and attitudes about death that occur over the course of people's lives.

Death across the Life Span: Causes and Reactions

LO 19.2 Describe what death means at different stages of the life span.

Death is something we associate with old age. However, for many individuals, death comes earlier. In such cases, in part because it seems unnatural for a younger person to die, the reactions to death are particularly extreme. In the United States today, in fact, some people believe that children should be sheltered—that it is wrong for them to know much about death. Yet people of every age can experience the death of friends and family members, as well as their own death. How do our reactions to death evolve as we age? We will consider several age groups.

DEATH IN INFANCY AND CHILDHOOD. Despite its economic wealth, the United States has a relatively high infant mortality rate. In over 50 other countries, fewer infants die in the first year of birth than in the United States (World Fact Book, 2015).

As these statistics indicate, the number of parents who experience the death of an infant is substantial, and their reactions may be profound. The loss of a child typically brings up all the same reactions one would experience on the death of an older person, and sometimes even more severe effects as family members struggle to deal with a death at such an early age. One of the most common reactions is extreme depression (Murphy, Johnson, & Wu, 2003).

One kind of death that is exceptionally difficult to deal with is prenatal death, or *miscarriage*, a topic touched on in Chapter 2. Parents typically form psychological bonds with their unborn child, and consequently they often feel profound grief if it dies before it is born. Moreover, friends and relatives often fail to understand the emotional impact of miscarriage on parents, making parents feel their loss all the more keenly (Wheeler & Austin, 2001; Nikčević & Nicolaides, 2014).

Another form of death that produces extreme stress, in part because it is so unanticipated, is sudden infant death syndrome. In **sudden infant death syndrome,** or **SIDS**, a seemingly healthy baby stops breathing and dies of unexplained causes. Usually occurring between the ages of two and four months, SIDS strikes unexpectedly; a robust, hardy baby is placed into a crib at nap time or night time and never wakes up.

WATCH THIS VIDEO ON MYPSYCHLAB GRIEVING
A LOSS PART 1: BOB, 81 YEARS OLD

sudden infant death syndrome (SIDS)
the unexplained death of a seemingly healthy baby

In cases of SIDS, parents often feel intense guilt, and acquaintances may be suspicious of the "true" cause of death. As we discussed in Chapter 3, however, there is no known cause for SIDS, which seems to strike randomly, and parents' guilt is unwarranted (Paterson et al., 2006; Kinney & Thach, 2009; Mitchell, 2009).

During childhood, the most frequent cause of death is accidents, most of them due to motor vehicle crashes, fires, and drowning. However, a substantial number of children in the United States are victims of homicides, which have nearly tripled in number since 1960. Homicide is among the third through fifth leading cause of death for children between the ages of 1 and 24, and the leading cause of death for 15- to 24-year-old African Americans (Centers for Disease Control and Prevention, 2014).

For parents, the death of a child produces the most profound sense of loss and grief. In the eyes of most parents, there is no worse death, including the loss of a spouse or of one's own parents. Parents' extreme reaction is partly based on the sense that the natural order of the world, in which children *should* outlive their parents, has somehow collapsed. Their reaction is often coupled with the feeling that it is their primary responsibility to protect their children from any harm, and they may feel that they have failed in this task when a child dies (Granek et al., 2015).

Parents are almost never well equipped to deal with the death of a child, and they may obsessively ask themselves afterward, over and over, why the death occurred. Because the bond between children and parents is so strong, parents sometimes feel that a part of themselves has died as well. The stress is so profound that the loss of a child significantly increases the chances of admission to a hospital for a mental disorder (Feigelman, Jordan, & Gorman, 2009; Fox, Cacciatore, & Lacasse, 2014).

CHILDHOOD CONCEPTIONS OF DEATH. Children themselves do not really begin to develop a concept of death until around the age of five. Although they are well aware of death before that time, they are apt to think of it as a temporary state that involves a reduction in living rather than a cessation. For instance, a preschool-age child might say, "Dead people don't get hungry—well, maybe a little" (Kastenbaum, 1985, p. 629).

Some preschool-age children think of death in terms of sleep—with the consequent possibility of waking up, just as Sleeping Beauty was awakened in the fairy tale (Lonetto, 1980). For children who believe this, death is not particularly fearsome; rather, it is something of a curiosity. If people merely tried hard enough—by administering medicine, providing food, or using magic—dead people might "return."

From *an educator's* perspective

Given their developmental level and understanding of death, how do you think preschool children react to the death of a parent?

In some cases, children's misunderstanding of death can produce devastating emotional consequences. Children sometimes leap to the erroneous conclusion that they are somehow responsible for a person's death. For instance, they may assume they could have prevented the death by being better behaved. In the same way, they may think that if the person who died really wanted to, she or he could return.

WATCH THIS VIDEO ON MYPSYCHLAB

CHILDREN'S PERCEPTION OF DEATH

Around the age of five, children better understand the finality and irreversibility of death. In some cases, children personify death as some kind of ghostlike or devilish figure. At first, though, they do not think of death as universal but rather as something that happens only to certain people. By about age nine, however, they come to accept the universality of death and its finality (Nagy, 1948). By middle childhood, children also learn about some of the customs involved with death, such as funerals, cremation, and cemeteries (Hunter & Smith, 2008).

For children who are themselves dying, death can be a very real concept. In a groundbreaking study, anthropologist Myra Bluebond-Langner (2000) found that some children were able to articulate that they were dying very directly, saying "I am going to die." Other children were more indirect, noting that they were never going back to school, expecting not to be around for someone's birthday party, or considering burying their dolls. Children may also be well aware that adults don't like to talk about their illness or of their possibility of dying.

DEATH IN ADOLESCENCE. We might expect the significant advances in cognitive development that occur during adolescence to bring about a sophisticated, thoughtful, and reasoned view of death. However, in many ways, adolescents' views of death are as unrealistic as those of younger children, although along different lines.

Although adolescents clearly understand the finality and irreversibility of death, they tend not to think it can happen to them, a fact that can lead to risky behavior. Adolescents develop a *personal fable*, a set of beliefs that causes them to feel unique and special—so special, in fact, that they may believe they are invulnerable and that the bad things that happen to other people won't happen to them.

Many times, the risky behavior that results from these beliefs causes death in adolescence. For instance, the most frequent cause of death among adolescents is accidents, most often involving motor vehicles. Other frequent causes include homicide, suicide, cancer, and AIDS (National Center for Health Statistics, 2015).

When adolescent feelings of invulnerability confront the likelihood of death due to an illness, the results can be shattering. Adolescents who learn that they have a terminal illness often feel angry and cheated—that life has been unjust to them. Because they feel—and act—so negatively, it may be difficult for medical personnel to treat them effectively.

In contrast, some adolescents diagnosed with a terminal illness react with total denial. Feeling indestructible, they may find it impossible to accept the seriousness of their illness. If it does not interfere with their acceptance of medical treatment, some degree of denial may actually be useful, as it allows adolescents to continue with their normal lives as long as possible (Beale, Baile, & Aaron, 2005).

DEATH IN YOUNG ADULTHOOD. Young adulthood is the time when most people feel primed to begin their lives. Past the preparatory time of childhood and adolescence, they are on the threshold of making their mark on the world. Because death at such a point in life seems close to unthinkable, its occurrence is particularly difficult. Actively pursuing their goals for life, they are angry and impatient with any illness that threatens their future.

In early adulthood, death is most likely to occur due to accidents, followed by suicide, homicide, AIDS, and cancer. By the end of early adulthood, however, disease becomes a more prevalent cause of death.

For those people facing death in early adulthood, several concerns are of particular importance. One is the desire to develop intimate relationships and express sexuality, both of which are inhibited, if not completely prevented, by a terminal illness. For instance, people who test positive for the AIDS virus may find it quite difficult to start new relationships. The role of sexual activities within evolving relationships presents even more challenging issues.

Another particular concern during young adulthood involves future planning. At a time when most people are mapping out their careers and deciding at what point to start a family, young adults who have a terminal illness face additional burdens. Should they marry, even though it is likely that the partner will soon end up widowed? Should a couple seek to conceive a child if the child is likely to be raised by only one parent? How soon should one's employer be told about a terminal illness, when it is clear that employers sometimes discriminate against unhealthy workers? None of these questions is easily answered.

Like adolescents, young adults sometimes make poor patients. They are outraged at their plight and feel the world is unfair, and they may direct their anger at care providers and loved ones. In addition, they may make the medical staff who provide direct care—nurses and orderlies—feel particularly vulnerable, since the staff themselves are often young.

DEATH IN MIDDLE ADULTHOOD. For people in middle adulthood, the shock of a life-threatening disease—which is the most common cause of death in this period—is not so great. By this point, people are well aware that they are going to die sometime, and they may be able to consider the possibility of death in a fairly realistic manner.

Their sense of realism doesn't make the possibility of dying any easier, however. In fact, fears about death are often greater in middle adulthood than at any time previously—or even in later life. These fears may lead people to look at life in terms of the number of years they have remaining as opposed to their earlier orientation toward the number of years they have already lived.

The most frequent cause of death in middle adulthood is heart attack or stroke. Although the unexpectedness of such a death does not allow for preparation, in some ways it is easier than a slow and painful death from a disease such as cancer. It is certainly the kind of death that most people prefer: When asked, they say they would like an instant and painless death that does not involve loss of any body part (Taylor, 2015).

DEATH IN LATE ADULTHOOD. By the time they reach late adulthood, people know with some certainty that their time is coming to an end. Furthermore, they face an increasing number of deaths in their environment. Spouses, siblings, and friends may have already died, a constant reminder of their own mortality.

The most likely causes of death are cancer, stroke, and heart disease during late adulthood. What would happen if these causes of death were eliminated? According to demographers' estimates, the average 70-year-old's life expectancy would increase around seven years (see Figure 19-1; Hayward, Crimmins, & Saito, 1997).

The prevalence of death in the lives of elderly people makes them less anxious about dying than they were at earlier stages of life. This does not mean that people in late adulthood welcome death. Rather, it implies that they are more realistic and reflective about it. They think about death, and they may begin to make preparations for it. Some begin to pull away from the world due to diminishing physical and psychological energy.

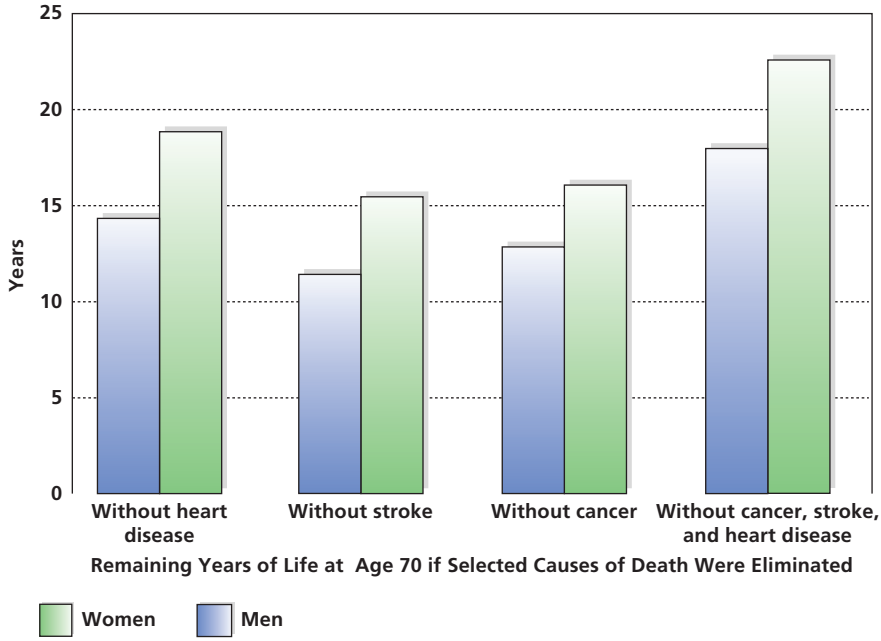
Impending death is sometimes accompanied by acceleration of declines in cognitive functioning. In what is known as the *terminal decline*, a significant drop in performance in cognitive areas such as memory and reading may foreshadow death within the next few years (Gerstorf et al., 2008; Thorvaldsson et al., 2008; Wilson et al., 2015).

Some elderly individuals actively seek out death, turning to suicide. In fact, the suicide rate for men climbs steadily during the course of late adulthood, and no age group has a higher rate of suicide than white men over the age of 85. (Adolescents and young

Figure 19-1 Adding Years

If the major causes of death were eliminated, the average 70-year-old person would live another seven years.

(**Source:** Hayward, Crimmins, & Saito, 1997.)



adults commit suicide in greater numbers, but their *rate* of suicide—the number of suicides as a proportion of the general adolescent population—is actually lower.) Suicide is often a consequence of severe depression or some form of dementia, or it can be due to the loss of a spouse. And, as we will discuss later in the chapter, some individuals, struck down with a terminal illness, seek the assistance of others in committing suicide (Chapple et al., 2006; Mezuk et al., 2008; Dombrovski et al., 2012).

One particularly important issue for older adults suffering from a terminal illness is whether their lives still have value. More than younger individuals, elderly people who are dying harbor concerns that they are burdens to their family or to society. Furthermore, they may be given the message, sometimes inadvertently, that their value to society has ended and that they have attained the status of "dying" as opposed to being "very sick" (Kastenbaum, 2000).

Do older people wish to know if death is impending? The answer, in most cases, is yes. Like younger patients, who usually state that they wish to know the true nature of an ailment, older people want the details of their illnesses. Ironically, candor is not something caregivers wish to provide: Physicians usually prefer to avoid telling dying patients that their illnesses are terminal (Goold, Williams, & Arnold, 2000; Hagerty et al., 2004). On the other hand, not all people wish to learn the truth about their condition or to know that they are dying.

Cultural Responses to Death

LO 19.3 Describe how dying is affected by culture.

It is important to keep in mind that individuals react to death in substantially different ways. In part, their reaction is produced by personality factors. For example, people who are generally anxious are more concerned about death. In addition to personal differences, there are significant cultural differences in how people view and react to death (see the *Developmental Diversity and Your Life* feature).

People's responses to death take many forms across different cultures, but even within Western societies, reactions to death and dying are quite diverse. For instance,

Developmental Diversity and Your Life

Differing Conceptions of Death

In the midst of a tribal celebration, an older man waits for his oldest son to place a cord around his neck. The older man has been sick, and he is ready to relinquish his ties to this earthly world. He asks that his son lift him to his death, and the son complies.

To Hindus in India, death is not an ending but rather part of a continual cycle. Because they believe in reincarnation, death is thought to be followed by rebirth into a new life. Death, then, is seen as a companion to life.

***

Differing conceptions of death lead to different rituals. For example, in India, bodies may be floated in the Ganges River following death.

Given that religious teachings regarding the meaning of life and death are quite diverse, it is not surprising that views of death and dying vary substantially. For instance, one study found that Christian and Jewish 10-year-olds viewed death from a more "scientific" vantage point (in terms of the cessation of physical activity in the body) than Sunni Muslim and Druze children of the same age, who are more likely to see death in spiritual terms. We cannot be sure whether such differences are due to the different religious and cultural backgrounds of the children or whether differences in exposure to dying people influence the rate at which the understanding of death develops. However, it is clear that members of the various groups had very different conceptions of death (Thorson et al., 1997; Aiken, 2000; Xiao et al., 2012).

For members of Native American tribes, death is seen as a continuation of life. For example, Lakota parents will tell their children, "Be kind to your brother, for someday he will die." When people die, they are assumed to move to a spirit land called "Wanagi Makoce," inhabited by all people and animals. Death, then, is not viewed with anger or seen as unfair (Huang, 2004).

Members of some cultures learn about death at an earlier age than others. For instance, exposure to high levels of violence and death may lead to an awareness of death earlier in some cultures than in cultures in which violence is less a part of everyday life. For example, children in Israel understand the finality, irreversibility, and inevitability of death at an earlier age than children in the United States and Britain (McWhirter, Young, & Majury, 1983; Atchley, 2000; Braun, Pietsch, & Blanchette, 2000).

consider which is better: for a man to die after a full life in which he has raised a family and been successful in his job, or for a courageous and valiant young soldier to die defending his country in wartime. Has one person died a better death than the other?

The answer depends on one's values, which are largely due to cultural and subcultural teachings, often shared through religious beliefs. For instance, some societies view death as a punishment or as a judgment about one's contributions to the world. Others see death as redemption from an earthly life of travail. Some view death as the start of an eternal life, while others believe that there is no heaven or hell and that an earthly life is all there is (Bryant, 2003).

Can Death Education Prepare Us for the Inevitable?

LO 19.4 Summarize how we can prepare for death.

"When will Mom come back from being dead?"
"Why did Barry have to die?"
"Did Grandpa die because I was bad?"

Children's questions such as these illustrate why many developmentalists, as well as **thanatologists**, people who study death and dying, have suggested that death education

thanatologists
people who study death and dying

should be an important component of everyone's schooling. Consequently, a relatively new area of instruction, termed death education, has emerged. *Death education* encompasses programs that teach about death, dying, and grief. Death education is designed to help people of all ages deal better with death and dying—both others' deaths and their own personal mortality.

Death education has evolved in part as a response to the way we hide death, at least in most Western societies. We typically give hospitals the task of dealing with dying people, and we do not talk to children about death or allow them to go to funerals for fear of upsetting them. Even those most familiar with death, such as emergency workers and medical specialists, are uncomfortable talking about the subject. Because it is discussed so little and is so removed from everyday life, people of all ages may have little opportunity to confront their feelings about death or to gain a more realistic sense of it (Kim & Lee, 2009; Waldrop & Kirkendall, 2009; Kellehear, 2015).

Several types of death education programs exist. Among them are the following:

- ***Crisis intervention education.*** After the shooting at the Sandy Hook Elementary School, surviving children received crisis intervention designed to deal with their anxieties. Younger children, whose conceptions of death were shaky at best, needed explanations of the loss of life that day geared to their levels of cognitive development. Crisis intervention education is used in less extreme times as well. For example, it is common for schools to make emergency counseling available if a student is killed or commits suicide (Sandoval, Scott, & Padilla, 2009).
- ***Routine death education.*** Although relatively little curricular material on death is available at the elementary school level, coursework in high schools is becoming increasingly common. For instance, some high schools have specific courses on death and dying. Furthermore, colleges and universities increasingly include courses relating to death in such departments as psychology, human development, sociology, and education (Eckerd, 2009; Corr, 2015).
- ***Death education for members of the helping professions.*** Professionals who will deal with death, dying, and grief as part of their careers have a special need for death education. Almost all medical and nursing schools now offer some form of death education to help their students. The most successful programs not only supply ways for providers to help patients deal with their own impending deaths and those of family members but also allow students to explore their feelings about the topic (Haas-Thompson, Alston, & Holbert, 2008; Kehl & McCarty, 2012).

Although no single form of death education will be sufficient to demystify death, the kinds of programs just described may help people come to grips more effectively with what is, along with birth, the most universal—and certain—of all human experiences.

Module 19.1 Review

- Death has been defined as the cessation of heartbeat and respiration (functional death), the absence of electrical brain waves (brain death), and the loss of human qualities.
- The death of an infant or a young child can be particularly difficult for parents, and for an adolescent death appears to be unthinkable. Death in young adulthood can appear unfair, while people in middle adulthood have begun to understand the reality of death. By the time they reach late adulthood, people know they will die and begin to make preparations.
- Cultural differences in attitudes and beliefs about death strongly influence people's reactions to it.
- Thanatologists recommend that death education become a normal part of learning.

Journal Writing Prompt

Applying Lifespan Development: How is human death viewed in your culture? Does the perception depend on the person's age, health, or other factors?

Confronting Death

Carol Reyes had been active all her life. When she broke her pelvis at 89, she was determined to walk again. With six months of intensive physical therapy, she did. At 93, she came down with pneumonia. After a month in the hospital, she returned home to the things she loved—her cat, her books, and taking an active part in local politics—a little weaker but basically sound.

Three years later, Carol's doctor told her she had ALS, a disease in which the motor neurons in the brain and spinal cord slowly die. She could take a drug called Rilutek to slow its progress, but eventually her muscles would atrophy, making it hard to use her hands or walk. She'd have trouble speaking and swallowing. In the end, her lungs would be paralyzed.

Carol agreed to try the drug but told her doctor she wanted a DNR—a Do Not Resuscitate order—for when her lungs began seizing up and breathing became difficult. "That's not a life I'd like to be living," she said.

Four months later, Carol Reyes found herself gasping for breath. She refused oxygen. She refused to go to the hospital. She died quickly, in her own bed.

Like other deaths, Reyes's raises a myriad of difficult questions. Was her refusal to take oxygen equivalent to suicide? Should the ambulance medic have complied with the request? Was she coping with her impending death effectively? How do people come to terms with death, and how do they react and adapt to it? Lifespan developmentalists and other specialists in death and dying have struggled to find answers to such questions.

Understanding the Process of Dying: Are There Steps toward Death?

LO 19.5 Describe ways in which people face the prospect of their own death.

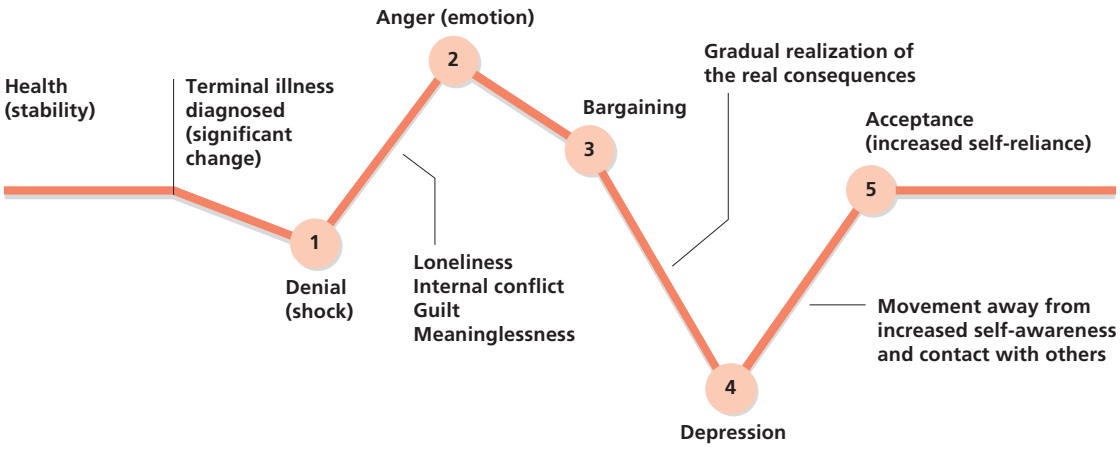
No individual has had a greater influence on our understanding of the way people confront death than Elisabeth Kübler-Ross. A psychiatrist, Kübler-Ross developed a theory of death and dying, built on extensive interviews with people who were dying and with those who cared for them (Kübler-Ross, 1969, 1982).

Based on her observations, Kübler-Ross initially suggested that people pass through five basic steps as they move toward death (summarized in Figure 19-2).

DENIAL. "No, I can't be dying. There must be some mistake." It is typical for people to protest in such a manner on learning that they have a terminal disease. Such objections

Figure 19-2 Moving toward the End of Life

There are five steps toward death, according to Kübler-Ross (1975).



represent the first stage of dying, *denial*. In denial, people resist the idea that they are going to die. They may argue that their test results have been mixed up, that an X-ray has been read incorrectly, or that their physician does not know what he or she is talking about (Teutsch, 2003).

ANGER. After they move beyond denial, people may be likely to express *anger*. A dying person may be angry at everyone: people who are in good health, their spouses and other family members, those who are caring for them, their children. They may lash out at others, and wonder—sometimes aloud—why *they* are dying and not someone else. They may be furious at God, reasoning that they have led good lives and that there are far worse people in the world who should be dying.

BARGAINING. "If you're good, you'll be rewarded." Most people learn this equation in childhood, and many try to apply it to their impending death. In this case, "good" means promising to be a better person, and the "reward" is staying alive.

In *bargaining*, dying people try to negotiate their way out of death. They may declare that they will dedicate their lives to the poor if God saves them. They may promise that if they can just live long enough to see a son married, they will willingly accept death later.

However, the promises that are part of the bargaining process are rarely kept. If one request appears to be granted, people typically seek another, and yet another. Furthermore, they may be unable to fulfill their promises because their illnesses keep progressing and prevent them from achieving what they said they would do.

In the end, of course, all the bargaining in the world is unable to overcome the inevitability of death. When people eventually realize that death is unavoidable, they often move into a stage of depression.

From *an educator's* perspective

Do you think Kübler-Ross's five steps of dying might be subject to cultural influences? Age differences? Why or why not?

DEPRESSION. Many dying people experience phases of *depression*. Realizing that the issue is settled and they cannot bargain their way out of death, people are overwhelmed with a deep sense of loss. They know that they are losing their loved ones and that their lives really are coming to an end.

The depression they experience may be of two types. In *reactive depression*, the feelings of sadness are based on events that have already occurred: the loss of dignity that may accompany medical procedures, the end of a job, or the knowledge that one will never return from the hospital to one's home.

Dying people also experience preparatory depression. In *preparatory depression*, people feel sadness over future losses. They know that death will bring an end to their relationships with others and that they will never see future generations. The reality of death is inescapable in this stage, and it brings about profound sadness over the unalterable conclusion of one's life.

ACCEPTANCE. Kübler-Ross suggested that the final step of dying is *acceptance*. People who have developed a state of acceptance are fully aware that death is impending. Unemotional and uncommunicative, they have virtually no feelings—positive or negative—about the present or future. They have made peace with themselves, and they may wish to be left alone. For them, death holds no sting.

EVALUATING KÜBLER-ROSS'S THEORY. Kübler-Ross has had an enormous impact on the way we look at death. As one of the first people to observe systematically how people approach their own deaths, she is recognized as a pioneer. Kübler-Ross was almost single-handedly responsible for bringing into public awareness the phenomenon

of death, which previously had languished out of sight in Western societies. Her contributions have been particularly influential among those who provide direct care to the dying.

On the other hand, her work has drawn significant criticism. For one thing, there are some obvious limitations to her conception of dying. It is largely limited to those who are aware that they are dying and who die in a relatively leisurely fashion. To people who suffer from diseases in which the prognosis is uncertain as to when or even if they will die, her theory is not applicable.

The most important criticisms, however, concern the stage-like nature of Kübler-Ross's theory. Not every person passes through every step on the way to death, and some people move through the steps in a different sequence. Some people even go through the same steps several times. Depressed patients may show bursts of anger, and an angry patient may bargain for more time (Kastenbaum, 1992; Larson, 2014).

Not everyone, then, proceeds through the stages in the same way. For example, a study of more than 200 recently bereaved people were interviewed immediately and then several months later. If Kübler-Ross's theory was correct, the final stage of acceptance comes at the end of a lengthy grieving process. But most of the participants expressed acceptance of the passing of their loved one right from the beginning. Moreover, rather than feeling anger or depression, two of the other putative stages of grief, participants reported mostly feeling a yearning for the deceased person. Rather than a series of fixed stages, grief looks more like an assortment of symptoms that rise and fall and eventually dissipate (Maciejewski, Zhang, Block, & Prigerso, 2007; Genevro & Miller, 2010; Gamino & Ritter, 2012).

The finding that people often follow their own, unique personal trajectories of grief has been especially important for medical and other caregivers who work with dying people. Because Kübler-Ross's stages have become so well known, well-meaning caregivers have sometimes tried to encourage patients to work through the steps in a prescribed order, without enough consideration for their individual needs.

Finally, there are substantial differences in people's reactions to impending death. The specific cause of dying; how long the process of dying lasts; a person's age, sex, and personality; and the social support available from family and friends all influence the course of dying and people's responses to it (Carver & Scheier, 2002).

Ultimately, there are significant concerns about the accuracy of Kübler-Ross's account of how people react to impending death. In response to some of these concerns, other theorists have developed alternative ideas. Psychologist Edwin Shneidman, for example suggests that there are "themes" in people's reactions to dying that can occur—and recur—in any order throughout the dying process. These include such feelings and thoughts as incredulity, a sense of unfairness, fear of pain or even general terror, and fantasies of being rescued (Leenaars & Shneidman, 1999).

Another theorist, Charles Corr, suggests that, as in other periods of life, people who are dying face a set of psychological tasks. These include minimizing physical stress, maintaining the richness of life, continuing or deepening their relationships with other people, and fostering hope, often through spiritual searching (Corr & Doka, 2001; Corr, Nabe, & Corr, 2000, 2006; Corr, 2015).

Choosing the Nature of Death: Is DNR the Way to Go?

LO 19.6 Describe ways in which people exercise control over the death decision.

The letters "DNR" written on a patient's medical chart have a simple and clear meaning. Standing for "Do Not Resuscitate," DNR signifies that rather than administering any and every procedure that might possibly keep a patient alive, no extraordinary means are to be taken. For terminally ill patients, DNR may mean the difference between dying immediately or living additional days, months, or even years, kept alive only by the most extreme, invasive, and even painful medical procedures.

The decision to use or not to use extreme medical interventions entails several issues. One is the differentiation of "extreme" and "extraordinary" measures from those that are simply routine. There are no hard-and-fast rules; people making the decision must consider the needs of the specific patient, his or her prior medical history, and factors such as age and even religion. For instance, different standards might apply to a 12-year-old patient and an 85-year-old patient with the same medical condition.

Other questions concern quality of life. How can we determine an individual's current quality of life and whether it will be improved or diminished by a particular medical intervention? Who makes such decisions—the patient, a family member, or medical personnel?

One thing is clear: Medical personnel are reluctant to carry out the wishes of the terminally ill and their families to suspend aggressive treatment. Even when it is certain that a patient is going to die, and patients determine that they do not wish to receive further treatment, physicians often claim to be unaware of their patients' wishes. For instance, although one-third of the patients ask not to be resuscitated, less than half of these people's physicians state that they know of their patients' preference (see Figure 19.3). In addition, only 49 percent of patients have their wishes entered on their medical charts. Physicians and other health-care providers may be reluctant to act on DNR requests in part because they are trained to save patients, not permit them to die, and in part to avoid legal liability issues (Goold, Williams, & Arnold, 2000; McArdle, 2002).

LIVING WILLS. In order to gain more control over decisions regarding the nature of their death, people are increasingly signing living wills. A **living will** is a legal document that designates the medical treatments a person does or does not want if the person cannot express his or her wishes (see Figure 19-4).

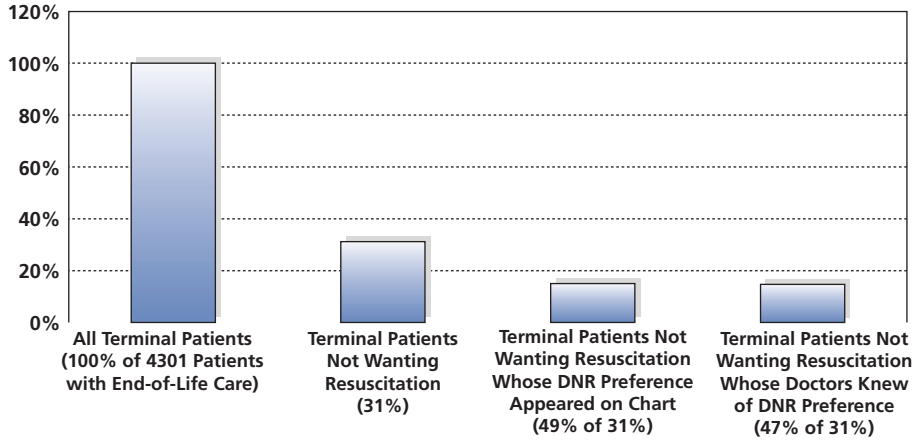
living will
a legal document designating what medical treatments people want or do not want if they cannot express their wishes

Some people designate a specific person, called a *health-care proxy*, to act as their representative in making health-care decisions. Health-care proxies are authorized either in living wills or in a legal document known as *durable power of attorney*. Health-care proxies may be authorized to deal with all medical care problems (such as a coma) or only terminal illnesses.

As with DNR orders, living wills are ineffective unless people take steps to make sure their health-care proxies and doctors know their wishes. Although they may be reluctant to do so in advance, people should also have frank conversations clarifying their wishes with the representatives they choose as their health-care proxies.

EUTHANASIA AND ASSISTED SUICIDE. Some three decades ago, Dr. Jack Kevorkian became well known for his invention and promotion of a "suicide machine," which allowed patients to push a button that releases anesthesia and a drug that stops the heart. By supplying the machine and the drugs, which patients administered themselves, Kevorkian was participating in a process known as *assisted suicide*, in which a person

Figure 19-3 Dying Hard: Experiences of 4,301 Patients with End-of-Life Care
(**Source:** Based on Knaus et al., 1995.)



provides the means for a terminally ill individual to commit suicide. Kevorkian ended up spending eight years in prison after being convicted of second-degree murder for his participation in an assisted suicide that was shown on the television show *60 Minutes*.

Assisted suicide continues to raise bitter conflict in the United States, and the practice is illegal in most states. Today, five states (Oregon, Washington, Vermont, New Mexico, and Montana) have passed "right to die" laws. In Oregon alone, some 750 people have taken medication to end their own lives (Ganzini, Beer, & Brouns, 2006; Davey, 2007; Edwards, 2015).

In many countries, assisted suicide is an accepted practice. For instance, in the Netherlands medical personnel may help end their patients' lives. However, several conditions must be met to make the practice permissible: At least two physicians must determine that the patient is terminally ill, there must be unbearable physical or mental suffering, the patient must give informed consent in writing, and relatives must be informed beforehand (Naik, 2002; Kleespies, 2004; Battin et al., 2007).

Assisted suicide is one form of **euthanasia**, the practice of assisting terminally ill people to die more quickly. Popularly known as "mercy killing," euthanasia can take a range of forms. *Passive euthanasia* involves removing respirators or other medical equipment that may be sustaining a patient's life, allowing the individual to die naturally. This happens when medical staff follow a DNR order, for example. In *voluntary active euthanasia*, caregivers or medical staff act to end a person's life before death would normally occur, perhaps by administering a dose of pain medication that they know will be fatal. Assisted suicide, as we have seen, lies between passive and voluntary active euthanasia. Euthanasia is an emotional and controversial—although surprisingly widespread—practice.

No one knows how widespread euthanasia truly is. However, one survey of nurses in intensive care units found that 20 percent had deliberately hastened a patient's death at least once, and other experts assert that euthanasia is far from rare (Asch, 1996).

Euthanasia is highly controversial, in part because it centers on decisions about who should control life. Does the right belong solely to an individual, a person's physicians, his or her dependents, the government, or some deity? Because, at least in the United States, we assume that we all have the absolute right to create lives by bringing children into the world, some people argue that we should also have the absolute right to end our lives (Allen et al., 2006; Goldney, 2012).

On the other hand, many opponents of euthanasia argue that the practice is morally wrong. In their view, prematurely ending someone's life, no matter how willing that person may be, is the equivalent of murder. Others point out that physicians are often inaccurate in predicting how long a person's life will last. For example, a large-scale study known as SUPPORT—the Study to Understand Prognoses and Preferences for Outcomes and Risks

Figure 19-4 A Living Will

What steps can people take to make sure the wishes they write into their living wills are carried out?

I,_____,
being of sound mind, make this statement as a directive to be followed if I become permanently unable to participate in decisions regarding my medical care. These instructions reflect my firm and settled commitment to decline medical treatment under the circumstances indicated below:

I direct my attending physician to withhold or withdraw treatment that merely prolongs my dying, if I should be in **an incurable or irreversible mental or physical condition** with no reasonable expectation of recovery, including but not limited to: (a) a **terminal condition**; (b) a **permanently unconscious condition**; or (c) a **minimally conscious condition in which I am permanently unable to make decisions or express my wishes**.

I direct that treatment be limited to measures to keep me comfortable and to relieve pain, including any pain that might occur by withholding or withdrawing treatment.
While I understand that I am not legally required to be specific about future treatments, **if I am in the condition(s) described above I feel especially strongly about the following treatments**:

I do not want cardiac resuscitation.
I do not want mechanical respiration.
I do not want tube feeding.
I do not want antibiotics.

However, I **do want** maximum pain relief, even if it may hasten my death.

Other directions (insert personal instructions):

These directions express my legal right to refuse treatment under federal and state law. I intend my instructions to be carried out, unless I have revoked them in a new writing or by clearly indicating that I have changed my mind.

Signed:_____ Date:_____

Address:_____

Statement by Witnesses
I declare that the person who signed this document appears to be at least eighteen (18) years of age, of sound mind, and under no constraint or undue influence. The person who signed this document appeared to do so willingly and free from duress. He or she signed (or asked another to sign for him or her) this document in my presence.

Witness:_____

Address:_____

Witness:_____

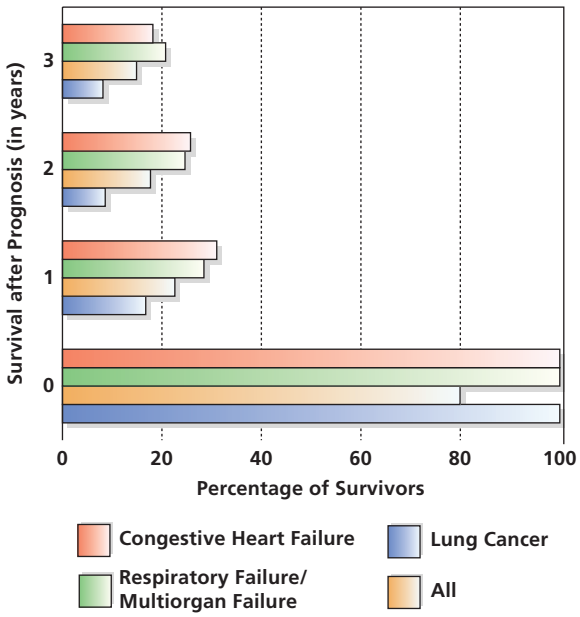
Address:_____

euthanasia
the practice of assisting people who are terminally ill to die more quickly

Figure 19-5 How Long Do "Terminal" Patients Really Live?

According to the large SUPPORT study, a significant percentage of a group of 3,693 patients given no more than a 50 percent chance of living for six months survived well beyond that period. Why do you think this happened?

(**Source:** Based on Lynn et al., 1997.)



of Treatment—found that patients often outlive physicians' predictions of when they will die. In some cases, patients have lived for years after being given no more than a 50 percent chance of living for six more months (Bishop, 2006; Peel & Harding, 2015; see Figure 19-5).

Another argument against euthanasia focuses on the emotional state of the patient. Even if patients ask or sometimes beg health-care providers to help them die, they may be suffering from a form of deep depression. In such cases, patients may be treated with antidepressant drugs that can alleviate the depression. Once the depression lifts, patients may change their minds about their earlier wish for death.

The debate over euthanasia is likely to continue. It is a highly personal issue, yet one that society increasingly must face as the world's elderly population increases (Becvar, 2000; Gostin, 2006; McLachlan, 2008).

Caring for the Terminally Ill: The Place of Death

LO 19.7 Compare and contrast the advantages of hospice and home care for the end of life.

About half the people in the United States who die do so in hospitals. It need not be that way. There are several reasons why hospitals are among the least desirable locales in which to face death. Hospitals are typically impersonal, with staff rotating throughout the day. Because visiting hours are limited, people frequently die alone, without the comfort of loved ones at their bedside.

home care
an alternative to hospitalization in which dying people stay in their homes and receive treatment from their families and visiting medical staff

Furthermore, hospitals are designed to make people better, not to deal with the dying, and it is extraordinarily expensive to provide custodial care for dying people. Consequently, hospitals typically don't have the resources needed to deal adequately with the emotional requirements of terminally ill patients and their families.

Because of the limitations of traditional hospitals in dealing with the dying, there are now several alternatives to hospitalization. In **home care**, dying people stay in their homes and receive treatment from their families and visiting medical staff. Many dying patients prefer home care because they can spend their final days in a familiar environment, with people they love and a lifetime accumulation of treasures around them.

Although the dying may prefer home care, it can be quite difficult for family members. Furnishing final care can offer family members a good deal of emotional solace because they are giving something precious to people they love. But it is extraordinarily draining, both physically and emotionally, to be on call 24 hours a day. Furthermore, because most relatives are not trained in nursing, they may provide less than optimal medical care. Many people decide they just aren't equipped to care for a dying family member at home (Perreault, Fothergill-Bourbonnais, & Fiset, 2004).

WATCH THIS VIDEO ON MYPSYCHLAB
HOSPICE CARE

For these families, another alternative to hospitalization that is becoming increasingly prevalent is hospice care. **Hospice care** is care for the dying provided in places devoted to those who are terminally ill. In the Middle Ages, hospices were facilities that provided comfort and hospitality to travelers. Drawing on that concept, today's hospices are designed to provide a warm, supportive environment for the dying. They do not focus on extending people's lives but rather on making their final days pleasant and meaningful. Typically, people who go to hospices are removed from treatments that are painful, and no extraordinary or invasive means are employed to make their lives longer. The emphasis is on making patients' lives as full as possible, not on squeezing out every possible moment of life at any cost (Johnson, Kassner, & Kutner, 2004; Corr, 2007; York et al., 2012).

hospice care
care provided for the dying in places devoted to those who are terminally ill

Although the research is far from conclusive, hospice patients appear to be more satisfied with the care they receive than those who receive treatment in more traditional settings. Hospice care, then, provides a clear alternative to traditional hospitalization for the terminally ill (Seymour et al., 2007; Rhodes et al., 2008; Clark, 2015).

Module 19.2 Review

- Elisabeth Kübler-Ross has identified five steps toward dying: denial, anger, bargaining, depression, and acceptance. The stage nature of her theory has been criticized as too inflexible, and other theorists have suggested alternatives.
- Issues surrounding dying are highly controversial, including the degree of measures that physicians should apply to keep dying patients alive and who should make the decisions about those measures. Living wills are a way for people to take some control over the decision. Assisted suicide and, more generally, euthanasia are highly controversial and are illegal in most of the United States, although many people believe they should be legalized if they are regulated.
- Although most people in the United States die in hospitals, increasing numbers are choosing home care or hospice care for their final days.

Journal Writing Prompt

Applying Lifespan Development: Is euthanasia legal in your country? Do you agree with this? Why or why not?

Grief and Bereavement

> *No one ever told me that grief felt so like fear. I am not afraid, but the sensation is like being afraid. The same fluttering in the stomach, the same restlessness, the yawning. I keep on swallowing.*
>
> *At other times it feels like being mildly drunk, or concussed. There is a sort of invisible blanket between the world and me. I find it hard to take in what anyone says. Or perhaps, hard to want to take it in. It is so uninteresting. (Lewis, 1985, p. 394)*

For something that is a universal experience, most of us are surprisingly ill prepared for the grief that follows the death of a loved one. Particularly in Western societies, where life expectancy is long and mortality rates are lower than at any time in history, people are apt to view death as an atypical event rather than an expected part of life. This attitude

makes grief all the more difficult to bear, particularly when we compare the present day with historical eras in which people lived shorter lives and the death rate was considerably higher. The first step in grieving, for most survivors in Western countries, is some sort of funeral (Nolen-Hoeksema & Larson, 1999; Bryant, 2003; Kleinman, 2012).

Mourning and Funerals: Final Rites

LO 19.8 Describe how survivors react to and cope with death.

Death is a big business in the United States. The average funeral and burial costs nearly $7,000. The purchase of an ornate, polished coffin; transportation to and from the cemetery in a limousine; and preparation of the body for preservation and viewing are among the services that people typically purchase in planning a funeral (Sheridan, 2013).

In part, the relatively grandiose nature of funerals is due to the vulnerability of those planning the funeral, who are typically close survivors of the deceased. Wishing to demonstrate love and affection, the survivors are susceptible to suggestions to "provide the best" for the deceased (Culver, 2003; Varga, 2014).

WATCH THIS VIDEO ON MYPSYCHLAB DEATH, GRIEF, AND MOURNING

But it is not only the pressure of enterprising salespersons that leads many people to spend thousands of dollars on a funeral. In large measure, the nature of funerals, like that of weddings, is determined by social norms and customs. Because an individual's death represents an important transition not only for loved ones but also for an entire community, the rites associated with death take on an added importance. In a sense, then, a funeral is not only a public acknowledgment that an individual has died but is also a recognition of everyone's ultimate mortality and an acceptance of the cycle of life.

In Western societies, funeral rituals follow a typical pattern, despite some surface variations. Prior to the funeral, the body is prepared in some way and is dressed in special clothing. Funerals usually include the celebration of a religious rite, the delivery of a eulogy, a procession of some sort, and some formal period, such as the wake for Irish Catholics and shivah for Jews, in which relatives and friends visit the mourning family and pay their respects. Military funerals typically include the firing of weapons and a flag draped over the coffin.

CULTURAL DIFFERENCES IN GRIEVING. Non-Western cultures include funeral rituals of quite different sorts. For instance, in some societies mourners shave their heads as a sign of grief, while in others they allow the hair to grow and men stop shaving for a period of time. In other cultures, mourners may be hired to wail and grieve. Sometimes noisy celebrations take place at funerals, while in other cultures silence is the norm. Even the nature of emotional displays, such as the amount and timing of crying, are determined culturally (Rosenblatt, 2001).

For example, mourners in Balinese funerals in Indonesia show little emotion because they believe they must be calm in order for the gods to hear their prayers. In contrast, mourners at African American funerals are encouraged to show their grief, and the funeral rituals are meant to allow attendees to display their feelings (Rosenblatt, 1988; Collins & Doolittle, 2006; Walter, 2012).

Historically, some cultures have developed funeral rites that strike us as extreme. For example, in *suttee*, a traditional Hindu practice in India that is now illegal, a widow was expected to throw herself into the fire that consumed her husband's body. In ancient China, servants were sometimes buried (alive) with their masters' bodies.

Ultimately, no matter what the particular ritual, all funerals basically serve the same underlying function: They mark the endpoint for the life of the person who has died—and provide a formal forum for the feelings of the survivors, a place where they can come together and share their grief and comfort one another. (Also see the *From Research to Practice* box.)

From Research to Practice

The Rising Popularity of Cremation

What will happen to your body when you die? Until about 20 years ago, the answer to that question was the same for most people: It will be buried. Burial entails placing the body in a wood or metal container and burying it in the ground, usually in a cemetery and usually with a stone or metal monument to mark the location. The body may first be injected with preservative chemicals to slow the decomposition process long enough to keep it presentable for viewing during visitation or funeral services, but nothing can stop its eventual return to its constituent elements (Sanburn, 2013).

Cremation uses intense heat and flame to greatly accelerate the decomposition process, achieving in about an hour what would take many years underground. The body is reduced to a small pile of ash, minerals, and bone fragments (which are then pulverized). Largely because of tradition and religious restrictions, burial has historically been greatly favored over cremation in the United States. But cremation has surged in popularity over the last couple of decades; its rate has increased from under 25 percent in the late 1990s to nearly 50 percent today and is expected to continue growing for decades to come (Defort, 2012).

Why the sudden shift in attitudes away from burial toward cremation? Economy has a lot to do with it. Americans became a lot more frugal after the economic downturn in 2008, and cremation is simply cheaper by far than burial—about one-third the cost. But other factors are at play, too. An important one is increased mobility. Burial made more sense in a time when most people lived and died not far from where they were born. People are increasingly leaving their birth places to attend school, work, retire, and ultimately die in different places, making it much less clear where the appropriate location for their burial would be (Dickinson, 2012; Sanburn, 2013).

The many options for disposition of cremated remains not only offer alternatives to permanent interment but also provide new creative and personal ways of honoring the life of the deceased. Cremated remains can be stored in beautiful containers of all kinds, turned into jewelry, used to start a seedling that will grow into a tree, scattered at a meaningful location, and even be turned into a coral reef or launched into space. The one significant downside to consider is the lack of an enduring monument—with no specific burial place, future generations have no place to go to view the final resting place of their ancestors (Roberts, 2010).

Shared Writing Prompt

What are your reasons for preferring burial or cremation for yourself when you die?

Bereavement and Grief: Adjusting to the Death of a Loved One

LO 19.9 Describe ways in which people experience grief and the functions it serves.

After the death of a loved one, a painful period of adjustment follows, involving bereavement and grief. **Bereavement** is acknowledgment of the objective fact that one has experienced a death, whereas **grief** is the emotional response to one's loss. Everyone's grief is different, but there are certain similarities in the ways people in Western societies adjust to the loss.

bereavement
acknowledgment of the objective fact that one has experienced a death

grief
the emotional response to one's loss

Survivors' first stage of grief typically entails shock, numbness, disbelief, or outright denial. People may avoid the reality of the situation, trying to carry on with the usual routines of their lives, although the pain may break through, causing anguish, fear, and deep sorrow and distress. If the pain is too severe, however, the person may cycle back to numbness. In some ways, such a psychological state may be beneficial, since it permits the survivor to make funeral arrangements and carry out other psychologically difficult tasks. Typically, people pass through this stage in a few days or weeks, although in some cases it lasts longer.

In the next phase, people begin to confront the death and realize the extent of their loss. They fully experience their grief, and they begin to acknowledge the reality that the separation from the dead person will be permanent. In so doing, mourners may suffer deep unhappiness or even depression, a normal feeling in this situation and not one necessarily requiring treatment. They may yearn for the dead individual. Emotions can range from impatient to lethargic. However, they also begin to view their past relationship with the deceased realistically, good and bad. In so doing, they begin to free themselves from some of the bonds that tied them to their loved ones (de Vries et al., 1997; Norton & Gino, 2014).

Finally, people who have lost a loved one reach the accommodation stage. They begin to pick up the pieces of their lives and to construct new identities. For instance, rather than seeing herself as someone's widowed spouse, a woman whose husband has died may come to regard herself as a single person. Still, there are moments when intense feelings of grief occur.

Ultimately, most people are able to emerge from the grieving process and live new lives, independent from the person who has died. They form new relationships, and some even find that coping with the death has helped them to grow as individuals. They become more self-reliant and more appreciative of life.

It is important to keep in mind that not everyone passes through the stages of grief in the same manner and in the same order. People display vast individual differences, partly due to their personalities, the nature of the relationship with the deceased, and the opportunities that are available to them for continuing their lives after the loss. In fact, most bereaved people are quite resilient, experiencing strong positive emotion, such as joy even soon after the death of a loved one. According to psychologist George Bonanno, who has studied bereavement extensively, humans are prepared in an evolutionary sense to move on after the death of someone close. He rejects the notion that there are fixed stages of mourning and argues that most people move on with their lives quite effectively (Bonanno, 2009; Mancini & Bonanno, 2012).

DIFFERENTIATING UNHEALTHY GRIEF FROM NORMAL GRIEF. Although ideas abound about what separates normal grief from unhealthy grief, careful research has shown that many of the assumptions that both laypersons and clinicians hold are wrong. There is no particular timetable for grieving, particularly the common notion that grieving should be complete a year after a spouse has died. For some people (but not all), grieving may take considerably longer than a year. And some individuals experience *complicated grief* (or sometimes *prolonged grief disorder*), a type of mourning that continues unceasingly for months and years (as we discussed in the previous chapter). An estimated 15 percent of those who are bereaved suffer from complicated grief (Piper et al., 2009; Schumer, 2009; Zisook & Shear, 2009).

Research also contradicts the common assumption that depression following the death of a loved one is widespread. In fact, only 15 to 30 percent of people show relatively deep depression following the loss of a loved one (Prigerson et al., 1995; Bonanno, Wortman, & Lehman, 2002; Hensley, 2006).

From *a social worker's* perspective

Why do you think the risk of death is so high for people who have recently lost a spouse? Why might remarriage lower the risk?

Similarly, it is often assumed that people who show little initial distress over a death are simply not facing up to reality, and that as a consequence they are likely to have problems later. This is not the case. In fact, those who show the most intense distress immediately after a death are the most apt to have adjustment difficulties and health problems later on (Boerner et al., 2005).

THE CONSEQUENCES OF GRIEF AND BEREAVEMENT. In a sense, death is catching, at least in terms of survivors' mortality. Widowed people are particularly at risk of death. Some studies find that the risk of death is as much as seven times higher than normal in the first year after the death of a spouse. At particular risk are men and younger women who have been widowed. Remarriage seems to lower the risk of death for survivors. This is particularly true for men who have lost their wives, although the reasons are not clear (Gluhoski et al., 1994; Martikainen & Valkonen, 1996; Aiken, 2000).

Bereavement is more likely to produce depression or other negative consequences if the person who has lost a loved one is already insecure, anxious, or fearful and therefore

less able to cope effectively. Furthermore, people whose relationships were marked by ambivalence before death are more apt to suffer poor post-death outcomes than those who were secure in their relationships. Those who were highly dependent on the person who died, and who therefore feel more vulnerable without them, are apt to suffer more after the death, as are those who spend a great deal of time reflecting on a loved one's death and their feelings of grief.

Bereaved people who lack social support from family, friends, or a connection to some other group, religious or otherwise, are more likely to experience feelings of loneliness, and therefore are more at risk. Finally, people who are unable to make sense of the death or find meaning in it (such as a new appreciation of life) show less overall adjustment (Davis & Nolen-Hoeksema, 2001; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Davis, 2002; Torges, Stewart, & Nolen-Hoeksema, 2008).

The suddenness of a loved one's death also appears to affect the course of grieving. People who unexpectedly lose their loved ones are less able to cope than those who were able to anticipate the death. For instance, in one study, people who experienced a sudden death still had not fully recovered four years later. In part, this may be because sudden, unanticipated deaths are often the result of violence, which occurs more frequently among younger individuals (Burton, Haley, & Small, 2006; De Leo et al., 2014). (Also see the *Are You an Informed Consumer of Development?* feature.)

Are You an Informed Consumer of Development?

Helping a Child Cope with Grief

Because of their limited understanding of death, younger children need special help in coping with grief. Among the strategies that can help are the following:

- Be honest. Don't say that a dead person is "sleeping" or "on a long trip." Use age-appropriate language to tell children the truth. Gently, but clearly, point out the irreversibility and the final and universal nature of death. For example, you might answer questions about whether grandma will be hungry by pointing out that, "No, after a person dies, their body doesn't work anymore, so it doesn't need food."
- Encourage expressions of grief. Don't tell children not to cry or show their feelings. Instead, tell them that it is understandable to feel terrible and that they may always miss the deceased. Encourage them to draw a picture, write a letter, or express their feelings in some other way. At the same time, assure them that they will always have good memories of the person who has died.
- Reassure children that they are not to blame for the death. Children sometimes attribute a loved one's death to their own behavior—if they had not misbehaved, they mistakenly reason, the person would not have died.
- Understand that children's grief may surface in unanticipated ways. Children may show little or no grief at the time of the death, but later they may become upset for no apparent reason or revert to behaviors such as sucking their thumb or wanting to sleep with their parent or parents. Keep in mind that death can be overwhelming for a child, and try to be consistently loving and supportive.
- Children may respond to books for young persons about death. One especially effective book is *When Dinosaurs Die*, by Laurie Krasny Brown and Marc Brown.

Module 19.3 Review

- Bereavement refers to the loss of a loved one; grief refers to the emotional response to that loss. Funeral rites play a significant role in helping people acknowledge the death of a loved one, recognize their own mortality, and proceed with their lives.
- For many people, grief passes through denial, sorrow, and accommodation stages. Children need special help coping with grief.

Journal Writing Prompt

Applying Lifespan Development: What are some ways to help a child cope with the death of a loved one?

Epilogue

This chapter and the final part of the book focus on late adulthood and the end of life. Genuine physical and cognitive declines finally become the norm, but people can continue to lead healthy, engaged lives throughout most of the period—in defiance of stereotypes that characterize them as decrepit and doddering.

As in other periods of the life span, continuity and change are both evident in late adulthood. For example, we noticed that individual differences in cognitive performance, even as they show declines, reflect individual differences that were present in earlier years. We saw that lifestyle choices made earlier, such as participation in exercise, contribute to health and longevity during this time.

Social and personality development can continue throughout late adulthood. We saw that although most people show similar personality traits to those of their earlier years, late adulthood also affords a unique perspective on the more turbulent years that have gone before. People defy stereotypes of late adulthood in the varied ways they live and the rich relationships they sustain in this period.

We ended the book with a consideration of the inevitable end of life. Even here, as we considered death and its meaning at various stages in the life span and across cultures, we saw that there are challenges to be faced and satisfaction to be drawn from a graceful departure from life whether in a hospital, hospice, or palliative or home care setting.

In sum, the story of the entire life span is one of fresh challenges and opportunities as we continuously undergo and adjust to physical and cognitive changes and learn to relate to new social situations. Development persists virtually to the point of death, and with preparation, we can appreciate and learn from all parts of the life span.

Before you leave the book, return to the chapter prologue, about Jules Beckham, the 100-year-old man who has survived all his friends. Based on your understanding of death and dying, answer the following questions.

1. How have Jules's attitudes toward death changed since he was a young man in the war? Why is this typical of changing views of death across the life span?
2. If Jules were told tomorrow that he had only three months to live, how do you think he would take it? Which of the Kübler-Ross stages of dying do you think he might experience?
3. Jules has written a living will. Do you think his family and physicians should honor it when the time comes? Why or why not?
4. Although Jules has a loving family, all of his friends have pre-deceased him. In what ways would this affect the quality of life he so deeply values?

Looking Back

LO 19.1 Review the difficulties in defining death.

The precise point of death is difficult to define. Functional death refers to the absence of heartbeat and respiration, from which people can be resuscitated, while brain death refers to the absence of electrical activity in the brain, which is irreversible.

LO 19.2 Describe what death means at different stages of the life span.

The death of an infant or a young child is among the most devastating experiences for parents, largely because it seems unnatural and entirely incomprehensible. Adolescents have an unrealistic sense of invulnerability that makes them susceptible to accidental death. Denial often makes it impossible for terminally ill adolescents to accept the seriousness of their condition. For young adults, death is virtually unthinkable. Young adults who are terminally ill can be difficult patients because of their strong sense of the injustice of their fate. In middle adulthood, disease becomes the leading cause of death, and awareness of the reality of death can lead to a substantial fear of death. People in late adulthood begin to prepare for death. Older people generally prefer to know if death is near, and the main issue they have to deal with is whether their lives continue to have value.

LO 19.3 Describe how dying is affected by culture.

Responses to death are in part determined by culture. Death may be regarded as a release from the pains of the world, the beginning of a pleasurable afterlife, a punishment or judgment, or simply the end to life.

LO 19.4 Summarize how we can prepare for death.

Death education can help people learn about death and consider their own mortality realistically.

LO 19.5 Describe ways in which people face the prospect of their own death.

Elisabeth Kübler-Ross suggests that people pass through five basic stages on their way to death: denial, anger, bargaining, depression, and acceptance. The stage nature of her theory has been criticized, and other theorists have suggested alternatives.

LO 19.6 Describe ways in which people exercise control over the death decision.

A living will is a means of asserting control over decisions surrounding one's death through specification of desired medical treatments in life-threatening situations and designation of a health-care proxy to enforce one's wishes. Assisted suicide, a form of euthanasia, is illegal in most of the United States.

LO 19.7 Compare and contrast the advantages of hospice and home care for the end of life.

Although most deaths in the United States occur in hospitals, an increasing number of terminal patients are opting for either home care or a hospice.

LO 19.8 Describe how survivors react to and cope with death.

Funeral rituals serve a dual function: acknowledging the death of a loved one and recognizing and anticipating the mortality of all who participate.

LO 19.9 Describe ways in which people experience grief and the functions it serves.

The death of a loved one brings a period of adjustment involving bereavement and grief. Grief may proceed through stages of shock and denial, the beginning of acceptance, and accommodation. One consequence of bereavement is an increase in the risk of death for the survivor. Children need particular help in dealing with death, including honesty, encouragement of expressions of grief, reassurance that the death was not due to the child's behavior, and understanding that the child's grief may be delayed and indirect.

Key Terms and Concepts

functional death 624
brain death 624
sudden infant death syndrome (SIDS) 625
thanatologists 629
living will 634
euthanasia 635
home care 636
hospice care 637
bereavement 639
grief 639

SUMMARY

9 Putting It All Together

Death and Dying

JAMES TIBURON, a nurse, admitted to never quite getting used to his many encounters with death. As part of his job, James saw deaths at every stage of the life span from infancy to old age, and from every cause imaginable. He dealt with grieving families, working with them to determine when it might be necessary to follow a DNR order and to walk them through the painful process of claiming their loved one's body from the hospital morgue. He witnessed firsthand the stages of death and dying and at least the initial stages of grief. For all his close-ups with death, James remains decisively positive and life-affirming, serving as a model for a plainspoken acceptance of death and moving on with life.

WHAT WOULD YOU DO?

■ Given what you know about possible places to die, what would you recommend for your closest loved one, in the event advice was needed: hospitalization, home care, or hospice care? Why? Would other choices be more appropriate for other loved ones you know?

What's your response?

WHAT WOULD A POLICYMAKER DO?

■ Should the government get involved in determining whether to permit individuals to make decisions about continuing their own lives in times of critical illness or extreme pain? Should this be a matter of law or of personal conscience?

What's your response?

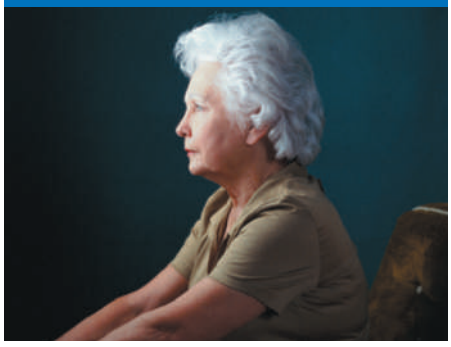
Death across the Life Span

- James is familiar with facing the question of when life ends.
- James has seen death at every age, including during infancy.
- He has dealt with family members who have lost loved ones at every point in the life span.
- As part of his job, James has studied death education and informally educated survivors about death.

Confronting Death

- James has dealt with patients who are passing through the steps of dying.
- He has worked with doctors and families in making life-or-death (e.g., DNR) decisions.
- He has probably been asked by patients to help them die.
- James has experience with the hospital as a place to die.

Grief and Bereavement



- As a worker in a metropolitan hospital, James has undoubtedly encountered many culturally different expressions of grief and many forms of bereavement.
- He has seen mostly the first stage of grief—shock, numbness, denial—in dealing with the survivors of deceased patients.
- James is likely to have had to talk to children about death, a particularly difficult task.

WHAT WOULD A HEALTH-CARE PROVIDER DO?

- Which criteria are most important in deciding whether or not to discontinue life-support systems? Do you think the criteria differ in different cultures?

What's your response?

WHAT WOULD AN EDUCATOR DO?

- What sorts of topics should be covered in depth in death education courses for health providers? For lay people?

What's your response?

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Name Index

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

Subject Index

C

D

E

F

G

H

M

N

O

P

Q

R

S

	PRENATAL PERIOD (conception to birth)	INFANCY AND TODDLERHOOD (birth to 3 years)
PHYSICAL DEVELOPMENT	*GERMINAL STAGE* (fertilization to 2 weeks): • Cells divide rapidly. • Zygote attaches to uterine wall. *EMBRYONIC STAGE* (2 to 8 weeks): • Major organs and body systems grow. *FETAL STAGE* (8 weeks to birth): • Major organs become differentiated. • Fetus kicks and clinches fist, hears sounds outside the uterus. • Health can be affected by mother's diet, health, age, or substance use. • Reflexes emerge.	• Rapid height and weight gains. • Neurons grow and form interconnections in the brain. Some functions have "critical periods" for normal development. • Infants wiggle, push upward, sit up, crawl, and eventually walk. • Infants reach, grasp, and pick up small objects. • Vision is 20/20 by 6 months, with depth perception and recognition of patterns, faces, shapes, and colors. • Infants hear a wide range of frequencies, localize sound, and make sound distinctions that underlie language development.
COGNITIVE DEVELOPMENT	• Intelligence is partly determined, and some psychological disorders may take root. • Cognitive functions can be affected by tobacco, alcohol, or drug use by mother.	• Infants begin to understand object permanence and "experiment" with the physical world. • Use of representations and symbols begins. • Information-processing speed increases. • Language develops rapidly through prelinguistic communication (babbling), use of single words to stand for whole ideas (holophrases), and telegraphic speech.
SOCIAL/PERSONALITY DEVELOPMENT	• Some personality traits are partly determined genetically (e.g., neuroticism, extroversion). • Drug and alcohol use by mother can lead to irritability, difficulty forming attachments in the child.	• Infants exhibit different temperaments and activity levels. • Facial expressions appear to reflect emotions; facial expressions of others are understood. • Toddlers begin to feel empathy. • A style of attachment to others emerges.
THEORIES & THEORISTS		
Jean Piaget		Sensorimotor stage
Erik Erikson		Trust-versus-mistrust stage (birth–1½ yrs) Autonomy-versus-shame-and-doubt stage (1½–3 yrs)
Sigmund Freud		Oral and anal stages
Lawrence Kohlberg		Premoral period

PRESCHOOL PERIOD (3 to 6 years)	MIDDLE CHILDHOOD (6 to 12 years)
• Height and weight continue to increase rapidly. • The body becomes less rounded and more muscular. • The brain grows larger, neural interconnections continue to develop, and lateralization emerges. • Gross and fine motor skills advance quickly. Children can throw and catch balls, run, use forks and spoons, and tie shoelaces. • Children begin to develop handedness.	• Growth becomes slow and steady. Muscles develop, and "baby fat" is lost. • Gross motor skills (biking, swimming, skating, ball handling) and fine motor skills (writing, typing, fastening buttons) continue to improve.
• Children show egocentric thinking (viewing world from their own perspective) and "centration," a focus on only one aspect of a stimulus. • Memory, attention span, and symbolic thinking improve, and intuitive thought begins. • Language (sentence length, vocabulary, syntax, and grammar) improves rapidly.	• Children apply logical operations to problems. • Understanding of conservation (that changes in shape do not necessarily affect quantity) and transformation (that objects can go through many states without changing) emerge. • Children can "decenter"— take multiple perspectives into account. • Memory encoding, storage, and retrieval improve, and control strategies (metamemory) develop. • Language pragmatics (social conventions) and metalinguistic awareness (self-monitoring) improve.
• Children develop self-concepts, which may be exaggerated. • A sense of gender and racial identity emerges. • Children begin to see peers as individuals and form friendships based on trust and shared interests. • Morality is rule-based and focused on rewards and punishments. • Play becomes more constructive and cooperative, and social skills become important.	• Children refer to psychological traits to define themselves. Sense of self becomes differentiated. • Social comparison is used to understand one's standing and identity. • Self-esteem grows differentiated, and a sense of self-efficacy (an appraisal of what one can and cannot do) develops. • Children approach moral problems intent on maintaining social respect and accepting what society defines as right. • Friendship patterns of boys and girls differ. Boys mostly interact with boys in groups, and girls tend to interact singly or in pairs with other girls.
Preoperational stage	Concrete operational stage
Initiative-versus-guilt stage	Industry-versus-inferiority stage
Phallic stage	Latency period
Preconventional morality level	Conventional morality level

	ADOLESCENCE (12 to 20 years)	YOUNG ADULTHOOD (20 to 40 years)
PHYSICAL DEVELOPMENT	• Girls begin the adolescent growth spurt around age 10, boys around age 12. • Girls reach puberty around age 11 or 12, boys around age 13 or 14. • Primary sexual characteristics develop (affecting the reproductive organs), as do secondary sexual characteristics (pubic and underarm hair in both sexes, breasts in girls, deep voices in boys).	• Physical capabilities peak in the 20's, including strength, senses, coordination, and reaction time. • Growth is mostly complete, although some organs, including the brain, continue to grow. • For many young adults, obesity becomes a threat for the first time, as body fat increases. • Stress can become a significant health threat. • In the mid-30's, disease replaces accidents as the leading cause of death.
COGNITIVE DEVELOPMENT	• Abstract thought prevails. Adolescents use formal logic to consider problems in the abstract. • Relative, not absolute, thinking is typical. • Verbal, mathematical, and spatial skills improve. • Adolescents are able to think hypothetically, divide attention, and monitor thought through metacognition. • Egocentrism develops, with a sense that one is always being observed. Self-consciousness and introspection are typical. • A sense of invulnerability can lead adolescents to ignore danger.	• As world experience increases, thought becomes more flexible and subjective, geared to adept problem solving. • Intelligence is applied to long-term goals involving career, family, and society. • Significant life events of young adulthood may shape cognitive development.
SOCIAL/PERSONALITY DEVELOPMENT	• Self-concept becomes organized and accurate and reflects others' perceptions. Self-esteem grows differentiated. • Defining identity is a key task. Peer relationships provide social comparison and help define acceptable roles. Popularity issues become acute; peer pressure can enforce conformity. • Adolescents' quest for autonomy can bring conflict with parents as family roles are renegotiated. • Sexuality assumes importance in identity formation. Dating begins.	• Forming intimate relationships becomes highly important. Commitment may be partly determined by the attachment style developed in infancy. • Marriage and children bring developmental changes, often stressful. Divorce may result, with new stresses. • Identity is largely defined in terms of work, as young adults consolidate their careers.
THEORIES & THEORISTS		
Jean Piaget	Formal operations stage	
Erik Erikson	Identity-versus-confusion stage	Intimacy-versus-isolation stage
Sigmund Freud	Genital stage	
Lawrence Kohlberg	Postconventional morality level may be reached	

MIDDLE ADULTHOOD (40 to 65 years)	LATE ADULTHOOD (65 years to death)
• Physical changes become evident. Vision declines noticeably, as does hearing, but less obviously. • Height reaches a peak and declines slowly. Osteoporosis speeds this process in women. Weight increases, and strength decreases. • Reaction time slows, but performance of complex tasks is mostly unchanged due to lifelong practice. • Women experience menopause, with unpredictable effects. The male climacteric brings gradual changes in men's reproductive systems.	• Wrinkles and gray or thinning hair are marks of late adulthood. Height declines as backbone disk cartilage thins. Women are especially susceptible to osteoporosis. • The brain shrinks, and the heart pumps less blood through the body. Reactions slow, and the senses become less acute. Cataracts and glaucoma may affect the eyes, and hearing loss is common. • Chronic diseases, especially heart disease, grow more common. Mental disorders, such as depression and Alzheimer's disease, may occur.
• Some loss of cognitive functioning may begin in middle adulthood, but overall cognitive competence holds steady because adults use life experience and effective strategies to compensate. • Slight declines occur in the efficiency of retrieval from long-term memory.	• Cognitive declines are minimal until the 80's. Cognitive abilities can be maintained with training and practice, and learning remains possible throughout the life span. • Short-term memory and memory of specific life episodes may decline, but other types of memory are largely unaffected.
• People in middle adulthood take stock, appraising accomplishments against a "social clock" and developing a consciousness of mortality. • Middle adulthood, despite the supposed "midlife crisis," usually is tranquil and satisfying. Individuals' personality traits are generally stable over time. • While marital satisfaction is usually high, family relationships can present challenges. • The view of one's career shifts from outward ambition to inner satisfaction or, in some cases, dissatisfaction. Career changes are increasingly common.	• Basic personality traits remain stable, but changes are possible. "Life review," a feature of this period, can bring either fulfillment or dissatisfaction. • Retirement is a major event of late adulthood, causing adjustments to self-concept and self-esteem. • A healthy lifestyle and continuing activity in areas of interest can bring satisfaction in late adulthood. • Typical circumstances of late adulthood (reduced income, the aging or death of a spouse, a change in living arrangements) cause stress.
Generativity-versus-stagnation stage	Ego-integrity-versus-despair stage