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LIFE-SPAN
DEVELOPMENT

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JOHN W. SANTROCK

LIFE-SPAN DEVELOPMENT

LIFE-SPAN DEVELOPMENT

Sixteenth Edition

JOHN W. SANTROCK

University of Texas at Dallas





LIFE-SPAN DEVELOPMENT, SIXTEENTH EDITION

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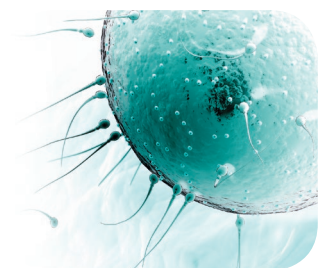
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about the author

John W. Santrock

John Santrock received his Ph.D. from the University of Minnesota. He taught at the University of Charleston and the University of Georgia before joining the Program in Psychology at the University of Texas at Dallas, where he currently teaches a number of undergraduate courses and was recently given the University's Effective Teaching Award. In 2010, he created the UT-Dallas Santrock undergraduate scholarship, an annual award that is given to outstanding undergraduate students majoring in developmental psychology to enable them to attend research conventions.

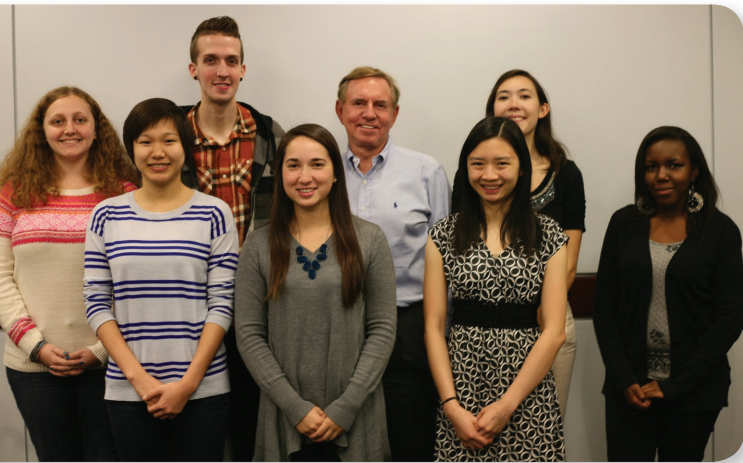
John has been a member of the editorial boards of *Child Development* and *Developmental Psychology*. His research on father custody is widely cited and used in expert witness testimony to promote flexibility and alternative considerations in custody disputes. John also has authored these exceptional McGraw-Hill texts: *Children* (13th edition), *Adolescence* (16th edition), *A Topical Approach to Life-Span Development* (8th edition), and *Educational Psychology* (5th edition).

For many years, John was involved in tennis as a player, teaching professional, and coach of professional tennis players. At the University of Miami (FL), the tennis team on which he played still holds the NCAA Division I record for most consecutive wins (137) in any sport. His wife, Mary Jo, has a master's degree in special education

and has worked as a teacher and a Realtor. He has two daughters—Tracy, who worked for a number of years as a technology marketing specialist, and Jennifer, who has been a medical sales specialist. However, recently both have followed in their mother's footsteps and are now Realtors. He has one granddaughter, Jordan, age 24, who works for the accounting firm Ernst & Young, and two grandsons, Alex, age 11, and Luke, age 10. In the last two decades, John also has spent time painting expressionist art.

Dedication:

**With special appreciation to my mother,
Ruth Santrock, and my father, John Santrock.**



John Santrock (back row middle) with the 2015 recipients of the Santrock Travel Scholarship Award in developmental psychology. Created by Dr. Santrock, this annual award (now in its sixth year) provides undergraduate students with the opportunity to attend a professional meeting. A number of the students shown here attended the 2015 meeting of the Society for Research in Child Development.

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expert consultants

Life-span development has become an enormous, complex field, and no single author, or even several authors, can possibly keep up with all of the rapidly changing content in the many periods and different areas of life-span development. To solve this problem, author John Santrock has sought the input of leading experts about content in a number of areas of life-span development. These experts have provided detailed evaluations and recommendations in their area(s) of expertise.

The following individuals were among those who served as expert consultants for one or more of the previous editions of this text:

Urie Bronfenbrenner, *Cornell University*

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Patricia Reuter-Lorenz, *University of Michigan*

Toni Antonucci, *University of Michigan*

Patricia Miller, *San Francisco State University*

Amanda Rose, *University of Missouri—Columbia*

Arthur Kramer, *University of Illinois*

Karen Fingerma, *Purdue University*

Cigdem Kagitcibasi, *Koc University*

Robert Kastenbaum, *Arizona State University*

Following are the expert consultants for the sixteenth edition, who (like those of previous editions) literally represent a *Who's Who* in the field of life-span development.



K. Warner Schaie Dr. Schaie is widely recognized as one of the pioneers who created the field of life-span development and continues to be one of its leading experts. He is currently the Evan Pugh Professor Emeritus of Human Development and Psychology at Pennsylvania State University. Dr. Schaie also holds an appointment as Affiliate

Professor of Psychiatry and Behavioral Sciences at the University of Washington. He received his Ph.D. in psychology from the University of Washington, an honorary Ph.D. from the Friedrich-Schiller University of Jena, Germany, and an honorary Sc.D. degree from West Virginia University. He has been given the Kleemeier Award for Distinguished Research Contributions and the Distinguished Career Contribution to Gerontology Award from the Gerontological Society of America, the MENSA lifetime career award, the Distinguished Scientific Contributions award from the American Psychological Association, and the Lifetime Career Award from the International Society for the Study of Intelligence. Dr. Schaie is author or editor of 60 books, including the textbook *Adult Development and Aging* (5th ed., with S. L. Willis), the *Handbook of the Psychology of Aging* (8th ed., with Sherry Willis), and *Developmental Influences on Adult Intelligence* (2013, 2nd ed.). He has directed the Seattle Longitudinal Study of cognitive aging since 1956 and is the author of more than 300 journal articles and chapters on the psychology of

aging. Dr. Schaie's current research interests include the life course of adult intelligence, its antecedents and modifiability, the influence of cognitive behavior in midlife on the integrity of brain structures in old age, the early detection of risk for dementia, and methodological issues in the developmental sciences.

"It is my belief that the 16th edition will continue the tradition of providing the most user-friendly life-span developmental psychology textbook available for a wide range of undergraduate students. It is soundly based on the current state of the scientific knowledge and continues to convey developing new concepts in a readily understandable manner. . . . There is extremely thorough coverage of recent research that is well integrated with more established findings from studies that have withstood the test of time." —**K. Warner Schaie**

Courtesy of K. Warner Schaie



Elena Grigorenko Dr. Grigorenko is one of the world's leading experts on genetic and environmental influences on development. She currently is the Hugh Roy and Lillie Cranz Cullen Distinguished Professor of Psychology and Developmental Cognitive Neuroscience, and Director of the Human Genetics Lab at the University of Houston. She previously held the

position of Emily Fraser Beede Professor of Developmental Disabilities, Child Studies, Psychology, and Epidemiology and Public Health at Yale and joined the University of Houston's psychology department in September 2015. Dr. Grigorenko is also a Professor in the Department of Molecular and Human Genetics at Baylor College of Medicine. Dr. Grigorenko's background is unique because of her joint degrees in developmental psychology and molecular genetics. She completed her doctoral and habilitation qualifications in general and educational psychology at Moscow State University in Russia, and her Ph.D. in developmental psychology and genetics at Yale University. Dr. Grigorenko is a licensed clinical psychologist (CT) specializing in forensic psychology. She has published more than 450 peer-reviewed articles, book chapters, and books. Dr. Grigorenko has received multiple professional awards for her work and received funding for her research from organizations such as the National Institutes of Health, the National Science Foundation, Cure Autism Now, and the Foundation for Child Development. She also has worked with children and their families in Africa, India, Russia, Saudi Arabia, and the United States.

"John Santrock's text is characterized by a number of strengths, among which is its breadth of coverage and its attempt to incorporate numerous new developments in the field of life-span studies. From inception to demise, from molecules to ethical dilemmas, this text touches it all." —**Elena Grigorenko**

© Yale University



Ross Thompson Dr. Thompson is one of the world's leading experts on children's socio-emotional development. He currently is Distinguished Professor of Psychology at the University of California–Davis, where he directs the Social and Emotional Development Lab. As a developmental psychologist, Dr. Thompson studies early parent-child relationships, the development of emotion understanding and emotion regulation, early moral development, and the growth of self-understanding in young children. He also works on the applications of developmental research to public policy concerns, including school readiness and its development, early childhood investments, and early mental health. Dr. Thompson has published five books, several best-selling textbooks, and over 200 papers related to his work. He is a founding member of the National Scientific Council on the Developing Child, has twice been Associate Editor of *Child Development*, and has received the Boyd McCandless Young Scientist Award for Early Distinguished Achievement from the American Psychological Association. Dr. Thompson also recently was given the Ann Brown Award for Excellence in Developmental Research and the University of California–Davis Distinguished Scholarly Public Service Award.

"My reading of Chapters 6, 8, and 10 once again engages me with an author who writes with animation and clarity, has intellectual currency with the field, and stimulates students' interest in the many topics associated with socioemotional development. Because of John Santrock's skill in discussing these topics with brevity but scope, readers are moved along effortlessly in their introduction to them. There is a lot packed into these chapters, but this is not because they are overemphasized but rather because the field is so rich and complex and there is a lot to be discussed. . . . As noted, the chapters have been admirably updated with citations to new research, and one appreciates the author's devotion to including new studies and findings." —**Ross Thompson**

"John Santrock's textbook has been one of the leading life-span development texts . . . and the 16th edition of the book continues in that tradition. The overall structure/organization of the text and of each individual chapter reviewed provides students with a strong framework for learning the material and connecting their ideas across different age periods and developmental stages. I really like the use of the connections theme in this edition of the book to shape students' approach to the many rich, complex topics at hand, and to provide them with a systematic, integrative learning experience. And the learning goals system seems like a very sensible way to help students focus on key ideas and concepts without getting lost in the vast amount of material presented. This often becomes problematic in life-span developmental courses where students fail to see how the material during one age period

Courtesy of Dr. Ross Thompson



Megan McClelland Dr. McClelland is a leading expert on children's self-regulation and academic achievement. She currently is the Katherine E. Smith Professor of Healthy Children and Families in Human Development and Family Sciences at Oregon State University. Dr.

McClelland also serves as Director of the Healthy Development in Early Childhood Research Core at the Hallie Ford Center for Healthy Children and Families. Her research focuses on optimizing children's development, especially in regard to their self-regulation and academic achievement. She has published over 50 theoretical and empirical articles on the development of self-regulation with colleagues and collaborators around the world, as well as a new book on promoting self-regulation in the early childhood classroom. Dr. McClelland is currently conducting two federally funded projects to develop measures of self-regulation and an intervention to improve school readiness in young children.

"Strong developmental focus across the life span and connections to theory, research, and application. I like the Looking Back and Looking Forward summaries and the Reach Your Learning Goals sections." —**Megan McClelland**

Courtesy of Dr. Megan McClelland



George Rebok Dr. Rebok is a life-span developmental psychologist who is nationally and internationally recognized for his research on cognitive interventions for older adults. He is currently a Professor in the Department of Mental Health in the Bloomberg School of Public Health at Johns Hopkins University and holds joint faculty appointments in the Department of Psychiatry and

Behavioral Sciences in the Johns Hopkins School of Medicine and in the Johns Hopkins Center on Aging and Health. Dr. Rebok served as a Principal Investigator of the NIA/NINR-funded ACTIVE (Advanced Cognitive Training for Independent and Vital Elderly) multi-site randomized intervention trial. He also was the Principal Investigator for the NIA-funded trial of the Baltimore Experience Corps® program that placed older volunteers in high-impact roles in public elementary schools to help meet schools' needs while increasing the physical, social, and cognitive activity of the volunteers. Dr. Rebok has published more than 200 journal articles and book chapters on life-span developmental psychology, preventive intervention trials, cognitive aging and dementia, developmental neuropsychology, and public mental health, and he is the author of the best-selling textbook *Life-Span Cognitive Development*. He is a Fellow of the American Psychological Association, the Association for Psychological Science, and the Gerontological Society of America.

"John Santrock's textbook has been one of the leading life-span development texts . . . and the 16th edition of the book continues in that tradition. The overall structure/organization of the text and of each individual chapter reviewed provides students with a strong framework for learning the material and connecting their ideas across different age periods and developmental stages. I really like the use of the connections theme in this edition of the book to shape students' approach to the many rich, complex topics at hand, and to provide them with a systematic, integrative learning experience. And the learning goals system seems like a very sensible way to help students focus on key ideas and concepts without getting lost in the vast amount of material presented. This often becomes problematic in life-span developmental courses where students fail to see how the material during one age period

of development relates to material at another age period. . . . The text provides balanced, objective coverage of the latest and most important research trends in the field of life-span human development. There are no areas that receive too much emphasis, nor are there areas in the chapters I reviewed that seem to omit or underemphasize important topics. . . . In this edition of the book, many new research studies have been added, and I think these changes and additions have kept pace with the latest developments in this fast-moving field. . . . One of the real strengths of the coverage in the chapters I reviewed involves the objective presentation of research evidence on both sides of controversial issues, and helping students draw their own conclusions about the current state of the science.” —George Rebok

© Lynn Offermann



Michelle de Haan Dr. Michelle de Haan is an internationally recognized expert on the development of brain and behavior in infancy and early childhood. She is currently a Reader at the University College London Institute of Child Health and Honorary Neuropsychologist at Great

Ormond Street Hospital for Children NHS Trust. She studied Child Psychology and Neuroscience at the University of Minnesota and received her Ph.D. in 1996. Dr. de Haan’s research applies neuroimaging and neuropsychological methods to examine the brain underpinnings of typical and atypical cognitive and social development in children, including those who were born preterm or have infant-onset epilepsy, sickle-cell disease, or congenital visual impairment. Dr. de Haan is Deputy Director of UCL’s M.Sc. in Clinical and Applied Paediatric Neuropsychology and is Editor-in-Chief of the journal *Developmental Science*. She has published six books and more than 100 papers and book chapters. She helped to develop *Wondermind*, an online game designed to bring art and science together to teach children about neuroscience.

“This highly readable and engaging book handles the challenging task of explaining the complexities of how humans develop throughout their lives in a clear and easily accessible way. The mix of the science of development with personal and individual stories and examples is brilliant, and the author does a fantastic job of explaining factors in biology and the environment that contribute to development across life stages and create different life pathways.” —Michelle de Haan

Courtesy of Michelle de Haan



Scott Johnson Dr. Johnson is one of the world’s leading experts on perceptual and cognitive development in infancy. He is currently a Professor of Psychology and Professor of Psychiatry and Biobehavioral Sciences at UCLA.

Dr. Johnson obtained his Ph.D. from Arizona State University and did postdoctoral work in the Center for Visual Science at the University of Rochester. His research interests center on mechanisms of perceptual, cognitive, motor, social, and cortical development, and relations among different developmental processes. Current research topics include object perception, face perception, intermodal perception, visual attention, early language development, and learning mechanisms in typical and at-risk populations. In studying infants, Dr. Johnson uses a combination of methods, including preferential looking, eye movements, electroencephalography, and connectionist modeling. He is currently Associate Editor of the journal *Cognition* and has served on the editorial boards of *Infancy*, *Infant Behavior and Development*, *Developmental Psychology*, the *British Journal of Developmental Psychology*, and *Frontiers in Neuroscience*.

“I think John Santrock has done a great job conveying broad concepts and theories in an accessible way, paying attention to issues that really will matter to students if they have families (breast feeding, sleep, and interacting with your infant). My intent in the review was to add a few bits of recent research. I am not sure what I’d recommend to be removed—it seems in good balance.” —Scott Johnson

Courtesy of UCLA News Service



David Almeida Dr. Almeida is one of the world’s leading experts on life-span developmental aspects of stress and coping. He is currently a Professor in Human Development and Family Studies and a faculty member of the Center for Healthy Aging at Penn State University. He has published more than 160 scientific papers on this topic. His primary interest has been the influence

of daily stress on healthy aging, but he has also examined stress processes in specific populations and contexts, such as workplace and family interactions, parents of children with developmental disabilities, and family caregivers. His research has shown that minor yet frequent daily stressors are often better predictors of important health outcomes than major life events. Dr. Almeida holds leadership roles in three current National Institutes of Health Research Initiatives, including the Midlife in the United States (MIDUS) Study; the Work, Family and Health Research Network; and the Science of Behavior Change Network.

“John Santrock’s new edition of *Life-Span Development* offers the latest theories, research, and applications in human developmental science. The number of recent citations is extraordinary and the integration of this new material makes the new edition impressive.” —David Almeida

Courtesy of Dr. David Almeida

Connecting *research* and *results*

As a master teacher, John Santrock connects current research and real-world applications. Through an integrated, personalized digital learning program, students gain the insight they need to study smarter and improve performance.

McGraw-Hill Education Connect is a digital assignment and assessment platform that strengthens the link between faculty, students, and course work, helping everyone accomplish more in less time. Connect Psychology includes assignable and assessable videos, quizzes, exercises, and interactivities, all associated with learning objectives. Interactive assignments and videos allow students to experience and apply their understanding of psychology to the world with fun and stimulating activities.



Learn, Apply, Reflect

At the higher end of Bloom's taxonomy (analyze, evaluate, create), students can learn, apply, and reflect through McGraw-Hill Education's *Quest*, now available for lifespan development, which takes them on an engaging journey through the lifespan where they are in the center of the action. Using a game-like learning environment based on real-life situations and points of view, including those of guidance counselors, health-care professionals, and parents, students collect clues and make decisions to see how their choices affect outcomes. The purpose-driven approach not only helps students build their critical thinking skills using core concepts and related research, but also answers the age-old question of "why does this matter for me?" These modules are assignable and assessable within Connect Psychology, to track student performance.

Real people, real world, real life

Also at the higher end of Bloom's taxonomy, the McGraw-Hill Education Milestones video series is an observational tool that allows students to experience life as it unfolds, from infancy to late adulthood. This ground-breaking, longitudinal video series tracks the development of real children as they progress through the early stages of physical, social, and emotional development in their first few weeks, months, and years of life. Assignable and assessable within Connect Psychology, Milestones also includes interviews with adolescents and adults to reflect development throughout the entire lifespan.

Attachment Colin and Esme Brain Development Colin 8-24wks Conflict and Play Mult Child 1-3yrs Counting Amalia 40-47mths Development of Taste Amalia 4-20mths Emergence of Friendship Mult Child 1-4yrs

Language Challenges, Jasmine, 2-4yrs

Milestones:

2 Parker has begun experiencing the changes of puberty. The age range for boys beginning puberty is usually ___ to ___.

Barry
Age 78

Inform and Engage on Psychological Concepts

At the lower end of Bloom's taxonomy, students are introduced to Concept Clips, the dynamic, colorful graphics and stimulating animations that break down some of psychology's most difficult concepts in a step-by-step manner, engaging students and aiding in retention. They are assignable and assessable in Connect or can be used as a jumping-off point in class. Now with audio narration, the Sixteenth Edition also includes new Concept Clips on topics such as object permanence and conservation, as well as theories and theorists like Bandura's social cognitive theory, Vygotsky's sociocultural theory, Buss's evolutionary theory, and Kuhl's language development theory.

Better Data, Smarter Revision, Improved Results

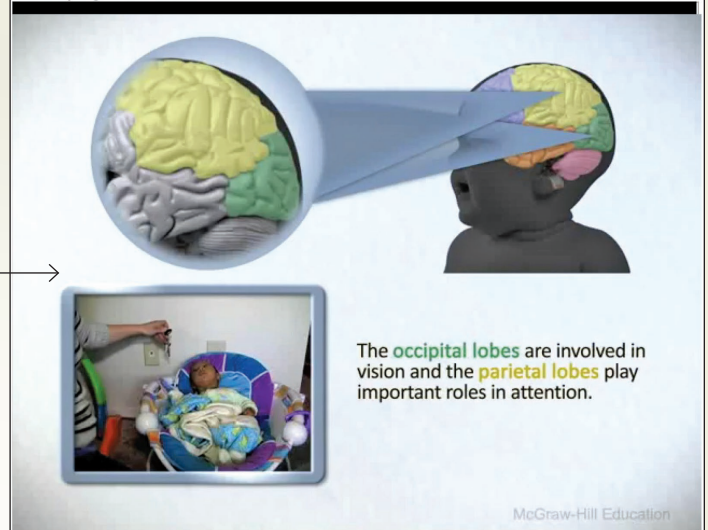
Students helped inform the revision strategy of *Life-Span Development*. McGraw-Hill Education's Smartbook is the first and only adaptive reading and learning experience! SmartBook helps students distinguish the



Developing Brain: Infant



Developing Brain: Infant



concepts they know from the concepts they don't, while pinpointing the concepts they are about to forget. SmartBook continuously adapts to create a truly personalized learning path. SmartBook's real-time reports help both students and instructors identify the concepts that require more attention, making study sessions and class time more efficient.

Informed by Students

Content revisions are informed by data collected anonymously through McGraw-Hill Education's SmartBook.

STEP 1. Over the course of three years, data points showing concepts that caused students the most difficulty were anonymously collected from Connect for Life-Span Development's SmartBook®.

STEP 2. The data from LearnSmart was provided to the author in the form of a *Heat Map*, which graphically illustrates "hot spots" in the text that affect student learning (see image at left).

STEP 3. The author used the *Heat Map* data to refine the content and reinforce student comprehension in the new edition. Additional quiz questions and assignable activities were created for use in Connect to further support student success.

RESULT: Because the *Heat Map* gave the author empirically based feedback at the paragraph and even sentence level, he was able to develop the new edition using precise student data that pinpointed concepts that gave students the most difficulty.

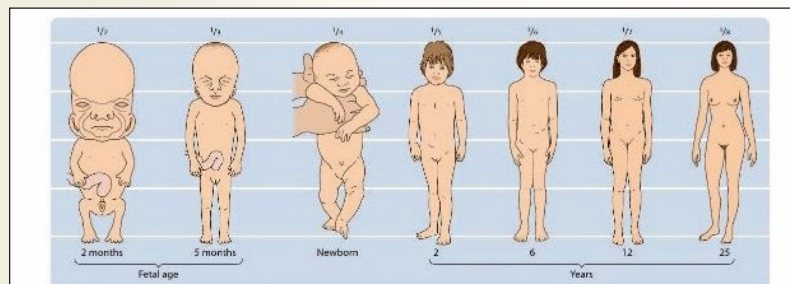


FIGURE 3.1
CHANGES IN PROPORTIONS OF THE HUMAN BODY DURING GROWTH. As individuals develop from infancy through adulthood, one of the most noticeable physical changes is that the head becomes smaller in relation to the rest of the body. The fractions listed refer to head size as a proportion of total body length at different ages.

Infancy The average North American newborn is 20 inches long and weighs 7½ pounds. Ninety-five percent of full-term newborns are 18 to 22 inches long and weigh between 5½ and 10 pounds.

In the first several days of life, most newborns lose 5 to 7 percent of their body weight. Once infants adjust to sucking, swallowing, and digesting, they grow rapidly, gaining an average of 5 to 6 ounces per week during the first month. Typically they have doubled their birth weight by the age of 4 months and have nearly tripled it by their first birthday. Infants grow about ½ inch per month during the first year, increasing their birth length by about 40 percent by their first birthday.

Infants' rate of growth slows considerably in the second year of life (Barns & others, 2013). By 2 years of age, infants weigh approximately 26 to 32 pounds, having gained a quarter to half a pound per month during the second year; at age 2 they have reached about one-fifth of their adult weight. The average 2-year-old is 32 to 35 inches tall, which is nearly one-half of adult height.

Early Childhood As the preschool child grows older, the percentage of increase in height and weight decreases with each additional year (Leifer, 2011). Girls are only slightly smaller and lighter than boys during these years. Both boys and girls slim down as the trunks of their bodies lengthen. Although their heads are still somewhat large for their bodies, by the end of the preschool years most children have lost their top-heavy look. Body fat also shows a slow, steady decline during the preschool years. Girls have more fatty tissue than boys; boys have more muscle tissue (McMahon & Stryewski, 2012).

Growth patterns vary individually (Wilson & Hockenberry, 2012). Think back to your preschool years. This was probably the first time you noticed that some children were taller than you, some shorter; some were fatter, some thinner; some were stronger, some weaker. Much of the variation is due to heredity, but environmental experiences are also involved. A review of the height and weight of children around the world concluded that two important contributors to height differences are ethnic origin and nutrition (Meredith, 1978).

Why are some children unusually short? The causes are congenital (such as growth retardation), prenatal problems, growth hormone deficiency, a physical problem that develops in childhood, maternal smoking during pregnancy, or an emotional difficulty (Wit, Kiess, & Mullis, 2011).

Middle and Late Childhood The period of middle and late childhood involves slow, consistent growth. This is a period of calm before the rapid growth spurt of adolescence.



The bodies of 5-year-olds and 2-year-olds are different from one another. The 5-year-old not only is taller and heavier, but also has a longer trunk and legs than the 2-year-old. What might be some other physical differences between 2- and 5-year-olds?

SMARTBOOK Dev Psych - A Topical Approach to LifeSpan Development - Santrock, 7e Physical Development And Biological Aging Iris Chaeyoung Kim back to Connect

PREVIEW READ PRACTICE REHEARSE

Type your answer in the box.

The specialization of function in one hemisphere of the cerebral cortex or the other is called _____

Do you know the answer?

I KNOW IT THINK SO UNSURE NO IDEA

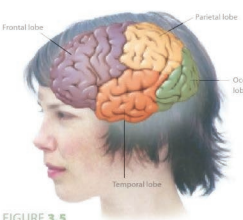


FIGURE 3.5 THE BRAIN'S FOUR LOBES

myelination The process of encasing axons with a myelin sheath, which helps increase the speed and efficiency of information processing.

lateralization Specialization of function in one hemisphere or the other of the cerebral cortex.

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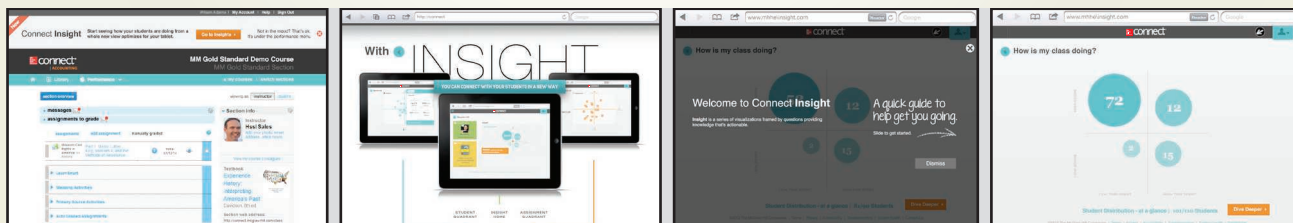
Personalized Grading, on the Go, At a Glance



connectINSIGHT™

Connect Insight is a one-of-a-kind visual analytics dashboard—now available for both instructors and students—that provides at-a-glance information regarding student performance. The immediate analysis from Connect Insight empowers students and helps instructors improve class performance efficiently and effectively.

- **Make It Intuitive.** Instructors and students receive instant, at-a-glance views of performance matched with student activity.
- **Make It Dynamic.** Connect Insight puts real-time analytics in the user's hands for a just-in-time approach to teaching and learning.
- **Make It Mobile.** Connect Insight is available on demand wherever and whenever needed.



preface

Making Connections . . . From My Classroom to *Life-Span Development* to You

Having taught life-span development every semester for more than three decades, I'm always looking for ways to improve my course and *Life-Span Development*. Just as McGraw-Hill looks to those who teach the life-span development course for input, each year I ask the almost 200 students in my life-span development course to tell me what they like about the course and the text, and what they think could be improved. What have my students told me lately about my course and text? Students say that highlighting connections among the different aspects of life-span development helps them to better understand the concepts. They confirm that a *connections* theme provides a systematic, integrative approach to the course material. Thus, I have continued to use this theme to shape my current goals for my life-span development course, which, in turn, are incorporated into *Life-Span Development*:

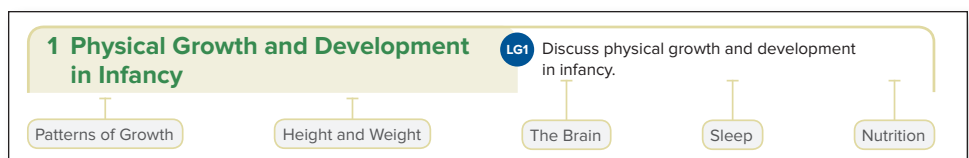
1. **Connecting with today's students** To help students learn about life-span development more effectively.
2. **Connecting research to what we know about development** To provide students with the best and most recent theory and research in the world today about each of the periods of the human life span.
3. **Connecting developmental processes** To guide students in making developmental connections across different points in the human life span.
4. **Connecting development to the real world** To help students understand ways to apply content about the human life span to the real world and improve people's lives; and to motivate them to think deeply about their own personal journey through life and better understand who they were, are, and will be.

Connecting with Today's Students

In *Life-Span Development*, I recognize that today's students are as different in some ways from the learners of the last generation as today's discipline of life-span development is different from the field 30 years ago. Students now learn in multiple modalities; rather than sitting down and reading traditional printed chapters in linear fashion from beginning to end, their work preferences tend to be more visual and more interactive, and their reading and study often occur in short bursts. For many students, a traditionally formatted printed textbook is no longer enough when they have instant, 24/7 access to news and information from around the globe. Two features that specifically support today's students are the adaptive ebook, Smartbook (see pages xviii–xx), and the learning goals system.

The Learning Goals System

My students often report that the life-span development course is challenging because of the amount of material covered. To help today's students focus on the key ideas, the Learning Goals System I developed for *Life-Span Development* provides extensive learning connections throughout the chapters. The learning system connects the



Physical Development in Infancy

1 Physical Growth and Development in Infancy

LG1 Discuss physical growth and development in infancy.

Patterns of Growth

Height and Weight

The Brain

- The cephalocaudal pattern is the sequence in which growth proceeds from top to bottom. The proximodistal pattern is the sequence in which growth starts at the center of the body and moves toward the extremities.
- The average North American newborn is 20 inches long and weighs 7.6 pounds. Infants grow about 1 inch per month in the first year and nearly triple their weight by their first birthday. The rate of growth slows in the second year.
- One of the most dramatic changes in the brain in the first two years of life is dendritic spreading, which increases the connections between neurons. Myelination, which speeds the conduction of nerve impulses, continues through infancy and even into adolescence. The cerebral cortex has two hemispheres (left and right). Lateralization refers to specialization of function in one hemisphere or the other. Early experiences play an important role in brain development. Neural connections are formed early in an infant's life.

chapter opening outline, learning goals for the chapter, mini-chapter maps that open each main section of the chapter, *Review, Connect, and Reflect* questions at the end of each main section, and the chapter summary at the end of each chapter.

The learning system keeps the key ideas in front of the student from the beginning to the end of the chapter. The main headings of each chapter correspond to the learning goals that are presented in the chapter-opening spread. Mini-chapter maps that link up with the learning goals are presented at the beginning of each major section in the chapter.

Then, at the end of each main section of a chapter, the learning goal is repeated in *Review, Connect, and Reflect*, which prompts students to review the key topics in the section, connect to existing knowledge, and relate what they learned to their own personal journey through life. *Reach Your Learning Goals*, at the end of the chapter, guides students through the bulleted chapter review, connecting with the chapter outline/learning goals at the beginning of the chapter and the *Review, Connect, and Reflect* questions at the end of major chapter sections.

connecting through research

How Does the Quality and Quantity of Child Care Affect Children?

In 1991, the National Institute of Child Health and Human Development (NICHD) began a comprehensive, longitudinal study of child-care experiences. Data were collected on a diverse sample of almost 1,400 children and their families at 10 locations across the United States over a period of seven years. Researchers used multiple methods (trained observers, interviews, questionnaires, and testing) and measured many facets of children's development, including physical health, cognitive development, and socioemotional development. Following are some of the results of what is now referred to as the NICHD Study of Early Child Care and Youth Development or NICHD SECCYD (NICHD Early Child Care Research Network, 2001, 2002, 2003, 2004, 2005, 2006, 2010).

- **Patterns of use.** Many families placed their infants in child care very soon after the child's birth, and there was considerable instability in the child-care arrangements. By 4 months of age, nearly three-fourths of the infants had entered some form of nonmaternal child care. Almost half of the infants were cared for by a relative when they first entered care; only 12

child-care settings was infrequent—only 12 percent of the children studied had experienced positive nonparental child care (such as positive talk, lack of detachment and flat affect, and language stimulation). Further, infants from low-income families experienced lower-quality child care than did infants from higher-income families. When quality of caregivers' care was high, children performed better on cognitive and language tasks, were more cooperative with their mothers during play, showed more positive and skilled interaction with peers, and had fewer behavior problems. Caregiver

training and good child-staff ratios were linked with higher cognitive and social competence when children were 54 months of age. Using data collected as part of the NICHD early child care longitudinal study, a recent analysis indicated that higher-quality early childhood care, especially at 27 months of age, was linked to children's higher vocabulary scores in the fifth grade (Belsky & others, 2007).

Higher-quality child care was also related to higher-quality mother-child interaction among the families that used nonmaternal care. Further, poor-quality care was related to higher rates of



What are some important findings from the national longitudinal study of child care conducted by the National Institute of Child Health and Human Development?
© Reina Rose Sibayan/The Jersey Journal/Landov Images

Connecting Research to What We Know about Development

Over the years, it has been important for me to include the most up-to-date research available. I continue that tradition in this edition by looking closely at specific areas of research, involving experts in related fields, and updating research throughout. *Connecting Through Research* describes a study or program to illustrate how research in life-span development is conducted and how it influences our understanding of the discipline. Topics range from *Do Children Conceived through In Vitro Fertilization Show Significant Differences in Developmental Outcomes in Adolescence?* to *How Much Does the Environment Affect Intelligence?* to *What Is the Relationship Between Fitness in Young Adults and Cardiovascular Health in Middle Age?*

The tradition of obtaining detailed, extensive input from a number of leading experts in different areas of life-span development also continues in this edition. Biographies and photographs of the leading experts in the field of life-span development appear on pages xv to xvii, and the chapter-by-chapter highlights of new research content are listed on pages xxv to xlii. Finally, the research discussions have been updated in every period and topic. I expended every effort to make this edition of *Life-Span Development* as contemporary and up-to-date as possible. To that end, there are more than 1,800 citations from 2014, 2015, and 2016 in the text.

Connecting Developmental Processes

Development through the life span is a long journey, and too often we forget or fail to notice the many connections from one point in development to another. A significant number of these connections are made in the text narrative, and features are included to help students connect topics across the periods of development.

Developmental Connections, which appear multiple times in each chapter, point readers to where the topic is discussed in a previous or subsequent chapter. *Developmental Connections* highlight links across age periods of development and connections between biological, cognitive, and socioemotional processes. These key developmental processes are typically discussed in isolation from each other, and students often fail to see their connections. Included in the *Developmental Connection* is a brief description of the backward or forward connection. For example, consider the development of the brain. In recent editions, I have significantly expanded content on the changes in the brain through the life span, including new coverage of changes in the brain during prenatal development and an expanded discussion of the aging brain in older adults. The prenatal brain discussion appears early in the text in the “Biological Beginnings” chapter, and the aging brain is described later in the “Physical Development in Late Adulthood” chapter. An important brain topic that we discuss in both chapters is neurogenesis, the production of new neurons. Connections between these topics are highlighted through *Developmental Connections*.

Topical Connections: Looking Back begin and conclude each chapter by placing the chapter’s coverage in the larger context of development. The Looking Back section reminds the reader of what happened developmentally in previous periods of development.

Finally, a *Connect* question appears in the section self-reviews—*Review, Connect, and Reflect*—so students can practice making connections between topics. For example, students are asked to connect what they learned in earlier chapters about the genetic links of autism to what they have just read about specific brain abnormalities associated with autism spectrum disorders.

developmental connection

Personality

Erikson proposed that individuals go through eight stages in the course of human development. Connect to “Introduction.”

topical connections *looking back*

We have discussed that impressive advances occur in the development of the brain during infancy. Engaging in various physical, cognitive, and socioemotional activities strengthens the baby’s neural connections. Motor and perceptual development also are key aspects of the infant’s development. An important part of this development is the coupling of perceptions and actions. The nature-nurture issue continues to be debated with regard to the infant’s perceptual development. In this chapter, you will expand your understanding of the infant’s brain, motor, and perceptual development by further examining how infants develop their competencies, focusing on how advances in their cognitive development help them adapt to their world, and how the nature-nurture issue is a key aspect of the infant’s cognitive and language development.

Connecting Development to the Real World

In addition to helping students make research and developmental connections, *Life-Span Development* shows the important connections between the concepts discussed and the real world. In recent years, students in my life-span development course have increasingly told me that they want more of this type of information. In this edition, real-life connections are explicitly made through the chapter opening vignette, *Connecting Development to Life*, the *Milestones* program that helps students watch life as it unfolds, and *Connecting with Careers*.

Each chapter also begins with a story designed to increase students’ interest and motivation to read the chapter. For example, the chapter on “Cognitive Development in Late Adulthood” begins with a description of the remarkable 93-year-old Helen Small, who published her first book at age 91 and completed her undergraduate degree 70 years after she started.

Connecting Development to Life describes the influence of development in a real-world context on topics including *From Waterbirth to Music Therapy, Increasing Children’s Self-Esteem*, and *Health Care Providers and Older Adults*.

The *Milestones* program, described on page xix, shows students what developmental concepts look like by letting them watch actual humans develop. Starting from infancy, students track several individuals, seeing them achieve major developmental milestones, both physically and cognitively. Clips continue through adolescence and adulthood, capturing attitudes toward issues such as family, sexuality, and death and dying.

Connecting with Careers profiles careers ranging from an educational psychologist to a toy designer to a marriage and family therapist

connecting development to life

Strategies for Parents and Their Young Adult Children

When adult children ask to return home to live, parents and their adult children should agree beforehand on the conditions and expectations. For example, they might discuss and agree on whether young adults will pay rent, wash their own clothes, cook their own meals, do any household chores, pay their phone bills, come and go as they please, be sexually active or drink alcohol at home, and so on. If these conditions aren’t negotiated at the beginning, conflict often results because the expectations of parents and young adult children will likely be violated.

Parents need to treat young adult children more like adults than children and to let go of much of their parenting role. Parents should interact with young adult children not as dependent children who need to be closely monitored and protected but rather as adults who are capable of responsible, mature behavior. Adult children have the right to choose how much they sleep and eat, how they dress, whom they choose as friends and lovers, what career they pursue, and how they spend their money.

However, if the young adult children act in ways that interfere with their parents’ lifestyles, parents need to say so. The discussion should

to ensure that their children succeed in college and adult life (Paul, 2003). Although well intentioned, this intrusiveness by parents can slow the process by which their children become responsible adults.

When they move back home, young adult children need to think about how they will need to change their behavior to make the living arrangement work. Elina Furman (2005) provides some good recommendations in *Boomerang Nation: How to Survive Living with Your Parents . . . the Second Time Around*. She recommends that when young adult children move back home they expect to make adjustments. And as recommended earlier, she urges young adults to sit down with their parents and negotiate the ground rules for living at home before they actually move back. Furman also recommends that young adults set a deadline for how long they will live at home and then stay focused on their goals (whether they want to save enough money to pay off their debts, save enough to start a business or buy their own home, finish graduate school, and so on). Too often young adults spend the money they save by moving home on luxuries such as shopping binges,



What are some strategies that can help parents and their young adult children get along better?
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connecting with careers

Helen Hadani, Ph.D., Developmental Psychologist, Toy Designer, and Associate Director of Research for the Center for Childhood Creativity

Helen Hadani obtained a Ph.D. from Stanford University in developmental psychology. As a graduate student at Stanford, she worked part-time for Hasbro Toys and Apple testing children's software and computer products for young children. Her first job after graduate school was with Zowie Entertainment, which was subsequently bought by LEGO. In her work as a toy designer there, Helen conducted experiments and focus groups at different stages of a toy's development, and she also studied the age-effectiveness of each toy. In Helen's words, "Even in a toy's most primitive stage of development . . . you see children's creativity in responding to challenges, their satisfaction when a problem is solved or simply their delight in having fun" (Schlegel, 2000, p. 50).

More recently, she began working with the Bay Area Discovery Museum's Center for Childhood Creativity (CCC) in Sausalito, California, an education-focused think tank that pioneers new research, thought-leadership, and teacher training programs that advance creative thinking in all children. Helen is currently the Associate Director of Research for the CCC.



Helen Hadani has worked as a toy designer and in a museum position that involves thinking of ways to increase children's creative thinking. Courtesy of Dr. Helen Hadani

to the director of an organization that promotes positive adolescent development to a geriatric nurse—each of which requires knowledge about human development.

The careers highlighted extend from the Careers Appendix that provides a comprehensive overview of careers in life-span development to show students where knowledge of human development could lead them.

Part of applying development to the real world is understanding its impact on oneself. An important goal I have established for my life-span development course and this text is to motivate students to think deeply about their own journey of life. To further encourage students to make personal connections to content in the text, *Reflect: Your Own Personal Journey*

of Life appears in the end-of-section review in each chapter. This feature involves a question that asks students to reflect on some aspect of the discussion in the section they have just read and connect it to their own life. For example, students are asked:

Do you think there is, was/will be a best age for you to be? If so, what is it? Why?

I always include this question in the first content lecture I give in life-span development, and it generates thoughtful and interesting class discussion. Early in the "Introduction" chapter is a research discussion on whether there is a best age to be, which includes recent research on the topic and a self-assessment that lets students evaluate their own life satisfaction. In addition, students are asked a number of personal connections questions in the photograph captions.

Online Instructor Resources

The resources listed here accompany *Life-Span Development*, Sixteenth Edition. Please contact your McGraw-Hill Education representative for details concerning the availability of these and other valuable materials that can help you design and enhance your course.

Instructor's Manual Broken down by chapter, these include chapter outlines, suggested lecture topics, classroom activities and demonstrations, suggested student research projects, essay questions, and critical thinking questions.

Test Bank This comprehensive Test Bank includes multiple-choice and essay questions. Organized by chapter, the questions are designed to test factual, applied, and conceptual understanding. This test bank is now also available within the test generation software, TestGen.

PowerPoint Slides These presentations cover the key points of each chapter and include charts and graphs from the text. They can be used as is, or you may modify them to meet your specific needs. These PowerPoints are ADA compliant.

Content Revisions

A significant reason why *Life-Span Development* has been successfully used by instructors for the previous fifteen editions is the painstaking effort and review that goes into making sure the text provides the latest research on all topic areas discussed in the classroom. This new edition is no exception, with more than 1,800 citations from 2014, 2015, and 2016. Also, I made a number of content revisions based on feedback McGraw-Hill obtained using a Heat Map system that highlights aspects of the content on which students are performing well and not well on tests.

Below is a sample of the many chapter-by-chapter changes that were made in this new edition of *Life-Span Development*.

Chapter 1: Introduction

- Update on life expectancy in the United States (U.S. Census Bureau, 2015)
- Expanded coverage of the effects of the rapid and dramatic increase in life expectancy on society and on the quality of life for older adults, with commentary about how society has essentially been built for young people rather than older adults and what is needed to improve the lives of older people (Carstensen, 2015)
- Coverage of a recent study that dramatically documented how strong cohort effects can be (Christensen & others, 2013). In this study, Danish cohorts born in 1905 and 1915 were compared, with the 1915 cohort having significantly better cognitive functioning and health in their nineties.
- Updated statistics on the recent increase in the percentage of U.S. children and adolescents under 18 years of age living in poverty, including data reported separately for African American and Latino families (DeNavas-Walt & Proctor, 2015)
- Description of recent research that found a higher level of conscientiousness was protective of older adults' cognitive functioning (Wilson & others, 2015)
- Inclusion of recent research on individuals from 22 to 93 years of age that found older adults reported having more positive emotional experiences than did young adults (English & Carstensen, 2014)
- Inclusion of recent information from studies on variations in age and well-being, including variations involving middle age and health (OECD, 2014; Steptoe, Deaton, & Stone, 2015)
- New coverage of the distinction between the evaluative and hedonic aspects of well-being, and how these different aspects produce different life course trajectories (Lachman, Teshale, & Agrigoroaei, 2015)
- New section, "Three Developmental Patterns of Aging," that describes the pathways of normal aging, pathological aging, and successful aging (Schaie, 2016)
- Expanded content on the early-later experience issue regarding sensitive parenting to include the importance of positive close relationships later in childhood, in adolescence, and in adulthood (Luong, Rauters, & Fingerhant, 2015; Mikulincer & Shaver, 2015; Wentzel, 2015)
- Coverage of a recent study in which older adults assessed in 2013–2014 engaged in a higher level of abstract reasoning than their counterparts who were assessed two decades earlier (Gerstorf & others, 2015)
- Inclusion of findings that cross-sectional studies indicate that 90 percent of cognitive aging decline is due to a slowing of processing speed while longitudinal studies reveal that 20 percent or less of cognitive aging decline is due to processing speed (MacDonald & Stawski, 2015, 2016)

Chapter 2: Biological Beginnings

- Editing and updating of chapter based on comments by leading experts Elena Grigorenko and David Moore
- New description of recent research on how exercise and nutrition can modify the behavior of genes (Lindholm & others, 2014; Ma & others, 2015)
- New content on how sleep deprivation can influence gene expression in negative ways, such as increased inflammation, expression of stress-related genes, and impairment of protein functioning (Da Costa Souza & Rieiro, 2015)
- Updated and expanded discussion of genome-wide association studies, including research on suicide (Sokolowski, Wasserman, & Wasserman, 2016) and glaucoma (Bailey & others, 2016)
- Expanded content about why recent improvements in next-generation sequencing have led to advances in analysis of genes and their links to various diseases (Au & others, 2016; Keller & others, 2016)
- New coverage of Cynthia Kenyon's important research on the search for longevity genes and interventions that might involve the use of drugs that mimic gene mutations linked to increased longevity
- Update on the percentage of individuals who have Klinefelter syndrome (1 in 1,000 males)
- Updated description of how research now strongly supports the use of hydroxyurea therapy for infants with sickle cell anemia, beginning at 9 months of age (Yawn & John-Sowah, 2015)
- Coverage of a recent research review that concluded many aspects of the developing prenatal brain can be detected in the first trimester and also providing information about identifying spina bifida early (Engels & others, 2016)
- Inclusion of recent research that found ultrasound can accurately identify the sex of the fetus between 11 and 13 weeks of gestation (Manzanares & others, 2016)
- Discussion of a recent study in which the mother's, but not the father's, adult secure attachment predicted infant adoptees' secure attachment (Lionetti, 2014)

- Description of a recent study of adoptive families in emerging adulthood that found perceptions of secure attachment relationships, as well as sensitive and open communication with birth parents, were linked to satisfaction for adoptees (Farr, Grant-Marsney, & Grotevant, 2014)

Chapter 3: Prenatal Development and Birth

- New organizing commentary that describes four important phases of brain development during the prenatal period
- Coverage of a recent large-scale study in Brazil in which flour that was fortified with folic acid produced a significant reduction in neural tube defects (Santos & others, 2016)
- Inclusion of a recent research review that found pregestational diabetes increases the risk of fetal heart disease (Pauliks, 2015)
- Discussion of a recent study that found simultaneous exposure to environmental tobacco smoke and alcohol during pregnancy increased the offspring's risk of having ADHD (Suter & others, 2015)
- Description of a recent study that revealed maternal smoking during pregnancy was associated with increased risk of asthma and wheezing in adolescence (Hollams & others, 2014)
- Coverage of the recent increase in e-cigarette use, including a survey that found pregnant women had misconceptions about the effects of e-cigarettes (Mark & others, 2015)
- Discussion of recent research reviews indicating that marijuana use during pregnancy alters brain functioning in the fetus (Calvigioni & others, 2014; Jaques & others, 2014)
- Inclusion of information from a recent research review that concluded maternal obesity during pregnancy is associated with an increased likelihood of offspring becoming obese in childhood and adulthood (Santangeli, Sattar, & Huda, 2015)
- Description of a recent study in which at 14 weeks following conception fetuses of obese pregnant women had less efficient cardiovascular functioning (Ingul & others, 2016)
- Discussion of a recent study in China that revealed folic acid supplementation during pregnancy decreased the risk of preterm birth (Liu & others, 2015)
- Coverage of two recent studies that found very advanced maternal age (40 years and older) was linked to negative perinatal outcomes, including spontaneous abortion, preterm birth, stillbirth, and fetal growth restriction (Traisisilp & Tongsong, 2015; Waldenstrom & others, 2015)
- Inclusion of a recent research review concluding that antidepressant use by pregnant women is linked to small increased risks of cardiac malfunctions in the fetus and persistent pulmonary hypertension in the newborn (Pearstein, 2015)
- Coverage of recent research that has found increasing paternal age decreases the success rate of in vitro fertilization and increases the risk of preterm birth (Sharma & others, 2015)
- New discussion of how the father's relationship with the mother might influence the mother's health and well-being during pregnancy and contribute to positive or negative prenatal development and birth
- Inclusion of a recent study that found intimate partner violence increased the mother's stress level (Fonseca-Machado Mde & others, 2015)
- Coverage of a recent study of adolescent mothers in which the CenteringPregnancy program was successful in getting participants to attend meetings, have appropriate weight gain, increase the use of highly effective contraceptive methods, and increase breast feeding (Trotman & others, 2015)
- Updated content on waterbirth, including the increasing number of studies that show either no newborn or maternal differences in deliveries or positive outcomes for waterbirth (Bovbjerg, Cheyney, & Everson, 2016; Davies & others, 2015; Nutter & others, 2014)
- Discussion of a recent study in which acupuncture reduced labor pain 30 minutes after the intervention (Allameh, Tehrani, & Ghasemi, 2015)
- Update on the percentage of U.S. births that take place in hospitals, at home, and in birthing centers and the percentage of babies born through caesarean delivery (Martin & others, 2015)
- Coverage of a recent study that found doula-assisted mothers were four times less likely to have a low birth weight baby (Gruber, Cupito, & Dobson, 2013)
- Updated statistics on the percentage of babies born preterm and low birth weight in the United States, including ethnic variations (Martin & others, 2015)
- Description of recent research on the increasing number of studies showing that progesterin is effective in reducing preterm births (Schoen & others, 2015)
- Coverage of the increasing number of studies indicating that exercise during pregnancy either has positive health outcomes for the mother and the newborn or that there are no differences in outcomes (Haakstad, Torset, & Bo, 2016; Poyatos-Leon & others, 2015)
- Discussion of a recent research review that concluded exercise during pregnancy can reduce the risk of excessive weight gain (Muktabhant & others, 2015) and a study that revealed exercise during pregnancy reduces the risk of hypertension (Barakat & others, 2015)
- Inclusion of recent research in which kangaroo care led to better physical development in low birth weight infants (Bera & others, 2014)
- Description of a recent study that found kangaroo care significantly reduced the amount of crying and increased heart rate stability in preterm infants (Choudhary & others, 2016)
- Inclusion of information about a recent study in which kangaroo care and massage therapy were equally effective in improving body weight and reducing hospital stay for low birth weight infants (Rangey & Sheth, 2015)
- Coverage of a recent study in Great Britain in which the use of kangaroo care in neonatal units resulted in substantial cost savings mainly because of reductions in diseases such as gastroenteritis and colitis (Lawson & others, 2016)
- Description of a recent study in which both massage (moderate-pressure stroking) and exercise (flexion and extension of the limbs) led to weight gain in preterm infants (Diego, Field, & Hernandez-Reif, 2014)

- Inclusion of a recent study in which massage therapy improved the scores of HIV-exposed infants on physical and mental scales, and also improved their hearing and speech (Perez & others, 2015)

Chapter 4: Physical Development in Infancy

- New description indicating that neural connections number in the trillions (de Haan, 2015)
- New discussion of the recent increase in the use of functional near-infrared spectroscopy to assess infants' brain activity because the technique is portable and allows researchers to monitor infants' brain activity while they are exploring the world around them (Brigadoi & Cooper, 2015; Ravicz & others, 2015)
- New Figure 3 that shows a 9-month-old at risk for autism whose brain activity is being monitored by functional near-infrared spectroscopy (fNIR)
- New description of Mark Johnson and his colleagues (Gluga & others, 2016; Johnson & others, 2015; Senju & others, 2016) as leading researchers on infant brain development, focusing on their neuroconstructivist approach and studies of the development of the prefrontal cortex and its function, early identification of autism, face processing, and early social experiences
- Main new section to open the coverage of sleep that focuses on different views of the functions of sleep, including an evolutionary perspective on its importance for survival, its restorative function in protein production and removal of neural waste (Picchioni & others, 2014; Xie & others, 2013), and its role in brain plasticity and synaptic connection (Maski, 2015; Pace-Schott & Spencer, 2015)
- Discussion of a recent study in which maternal sleep when the infant was 3 months old predicted infant sleep patterns at 6 months of age and the father's increased involvement in caregiving activities resulted in improved infant sleep (Tikotzky & others, 2015)
- New commentary that after prone sleeping position, the two most critical factors in predicting SIDS are (1) maternal smoking and (2) bed sharing (Mitchell & Krous, 2015)
- New section, "Sleep and Cognitive Development," including recent research that linked sleep in infancy with higher cognitive functioning in early childhood (Bernier & others, 2013)
- Coverage of a recent study that found poor sleep consolidation in infancy was associated with language delays in early childhood (Dionne & others, 2011)
- Inclusion of a recent research review of 27 studies that confirmed pacifier use is associated with a lower incidence of SIDS (Alm & others, 2015)
- New commentary that as public awareness of the importance of not letting infants sleep in a prone position has increased in recent years, the number of U.S. infant deaths due to prone sleeping has decreased
- Description of a recent Swedish study that revealed bed sharing was more common in SIDS deaths (Mollborg & others, 2015)
- Coverage of a recent study in which a lower quality of sleep at 1 year of age was linked to lower attention regulation and more behavior problems at 3 to 4 years of age (Sadeh & others, 2015)
- Updated data on the continuing increase in breast feeding by U.S. mothers (Centers for Disease Control and Prevention, 2014)
- Description of a recent Danish study that found breast feeding did not protect against allergic sensitization in early childhood and allergy-related diseases at 7 years of age (Jelding-Dannemand, Malby Schoos, & Bisgaard, 2015). However, in another recent study, breastfeeding was linked to a lower incidence of asthma from 6 to 42 months of age (Yamakawa & others, 2015).
- Discussion of a recent study in which infants who were breast fed for 9 months or longer were less likely to develop ear, throat, and sinus infections in the past year when they were 6 years old compared with their counterparts who were breast fed for 3 months or less (Li & others, 2014)
- Coverage of a recent large-scale study of more than 500,000 Scottish children that found those who were exclusively breast fed at 6 to 8 weeks were less likely to ever have been hospitalized through early childhood than their formula-fed counterparts (Ajetunmobi & others, 2015)
- Inclusion of recent research that found breast feeding was associated with a small increase in intelligence in children (Kanazawa, 2015)
- Inclusion of information about recent longitudinal studies that revealed when mothers participated prenatally and in early childhood in WIC programs young children showed short-term cognitive benefits and longer-term reading and math benefits (Jackson, 2015)
- New description of how the development of sitting skills in infancy might produce a developmental cascade of changes (Bornstein, Hahn, & Siwalsky, 2013; Adolph & Robinson, 2015)
- New discussion of how walking skills might produce a developmental cascade of changes in infancy, including increases in language skills (Adolph & Robinson, 2015; He, Walle, & Campo, 2015)
- Description of recent studies that indicated short-term training involving practice of reaching movements increased both preterm and full-term infants' reaching for and touching objects (Cunha & others, 2015; Guimaraes & Tudelia, 2015)
- Coverage of a recent study in which 3-month-olds who had regular gentle tactile stimulation when they were fetuses were more likely to have an easy temperament than their counterparts who experienced irregular gentle or no gentle tactile stimulation as fetuses (Wang, Hua, & Xu, 2015)
- Discussion of a recent neuroimaging study that found newborns likely experience some aspects of pain similarly to adults (Goksan & others, 2015). In this study, the brain regions in which newborns experienced pain much like adults do were in the thalamus and the somatosensory cortex. Also in this study, newborns had a lower pain threshold than adults did.

Chapter 5: Cognitive Development in Infancy

- Coverage of recent research that revealed problems in joint attention as early as 8 months of age were linked to a child being diagnosed with autism by 7 years of age (Veness & others, 2014)
- A recent study in which infants who initiated joint attention at 14 months of age had higher executive function at 18 months of age (Miller & Marcovitch, 2015)
- Discussion of recent research on when infantile amnesia begins to occur by Patricia Bauer and her colleagues (Bauer, 2015; Bauer & Larkina, 2015; Pathman, Doydum, & Bauer, 2015). In a recent study, by 8 to 9 years of age, children's memory of events that occurred at 3 years of age began to significantly fade away (Bauer & Larkina, 2014).
- Description of recent research in which vocabulary development from 16 to 24 months of age was linked to vocabulary, phonological awareness, reading accuracy, and reading comprehension five years later (Duff & others, 2015)
- Inclusion of a recent study involving joint attention in which infants' eye-gaze behaviors during Spanish tutoring sessions at 9.5 to 10.5 months of age predicted the infants' second-language phonetic learning at 11 months of age, indicating a strong influence of social interaction at the earliest ages of learning a second language (Convoy & others, 2015)
- Discussion of a recent study that revealed 18- to 24-month-old infants in low-SES families already had a smaller vocabulary and less efficient language processing than their infant counterparts in middle-SES families (Fernald, Marchman, & Weisleder, 2013)
- Description of a recent study in which child-directed speech in a one-to-one context at 11 to 14 months of age was linked to greater word production at 2 years of age than standard speech and speech in a group setting (Ramirez-Esparza, Garcia-Sierra, & Kuhl, 2014)
- Inclusion of recent research that found Japanese mothers who used more elaborative information-seeking responses during joint picture-book reading at 20 months had children with a better productive vocabulary at 27 months (Murase, 2014)
- New discussion of Patricia Kuhl's (2015) findings that the period when a baby's brain is most open to learning the sounds of a native language begins at 6 months for vowels and at 9 months for consonants
- New content on whether infants learn language effectively through television and videos
- Discussion of a recent study of toddlers in which frequent TV exposure increased the risk of delayed language development (Lin & others, 2015)
- Coverage of a recent study that found Skype provides some improvement in children's language learning over television and videos (Roseberry & others, 2014)
- New description of how some leading researchers have recently argued that empathy can be expressed before the infant's first birthday (Davidov & others, 2013)
- Inclusion of a recent study in which mothers were more likely than fathers to use soothing techniques to reduce infant crying (Dayton & others, 2015)
- Coverage of recent research indicating that smiling and laughter at 7 months of age was associated with self-regulation at 7 years of age (Posner & others, 2014)
- New discussion of describing infant temperament in terms of reactivity and self-regulation (Bates & Pettit, 2015)
- Revised description of the temperament category of extraversion/surgency
- Description of recent research that found an inhibited temperament at 2 to 3 years of age was related to social-phobia-related symptoms at 7 years of age (Lahat & others, 2014)
- Inclusion of recent findings indicating that an inhibited temperament in infants and young children is linked to the development of social anxiety disorder in adolescence and adulthood (Rapee, 2014; Perez-Edgar & Guyer, 2014)
- Discussion of recent research that found preschool children with high levels of surgency and negative affectivity were more likely to engage in a number of obesity-related eating behaviors (Leung & others, 2014)
- New research that revealed effortful control was a strong predictor of academic success skills in kindergarten children from low-income families (Morris & others, 2013)
- Description of a recent study in which maternal negativity and child behavior problems were most strongly linked for children who were low in effortful control and living in chaotic homes (Chen, Deater-Deckard, & Bell, 2014)
- New discussion of the recent interest in the *differential susceptibility* and *biological sensitivity to context* models that emphasize certain characteristics—such as a difficult temperament—may render children more vulnerable to difficulty in adverse contexts but also make them more likely to experience optimal growth in very supportive conditions (Belsky & others, 2015; Belsky & van IJzendoorn, 2015; Ellis & others, 2011; Hartman & Belsky, 2015; Simpson & Belsky, 2016)
- Coverage of a recent study in which parental sensitivity during the still-face paradigm when infants were 3, 5, and 7 months old was linked to infants' emotional and behavioral trajectories in the paradigm, which in turn predicted secure and insecure attachment at 12 and 14 months of age (Braungart-Rieker & others, 2014)
- Inclusion of recent research in which infant attachment insecurity (especially insecure resistant attachment) and early childhood behavioral inhibition predicted adolescent social anxiety symptoms (Lewis-Morrarty & others, 2015)
- Description of a meta-analysis in which secure attachment in infancy was related to social competence with peers in early childhood (Groh & others, 2014)
- New commentary about recent advances in infants' understanding of others (Rhodes & others, 2015), including research indicating that infants as young as 13 months of age seem to consider another's perspective when predicting their actions (Choi & Luo, 2015)

Chapter 6: Socioemotional Development in Infancy

- Inclusion of revisions based on feedback from leading experts Ross Thompson and John Bates

- Discussion of three recent studies on the transition to parenthood that found (1) men, especially men who were avoidantly attached, adapted more poorly to child care tasks than did women and less avoidantly attached men (Fillo & others, 2015); (2) in dual-earner couples after a child was born, women did more than 2 hours of additional work daily compared with 40 minutes more for men (Yavorsky & others, 2015); and (3) in comparison with married fathers, cohabiting fathers' personal dedication and relationship confidence decreased and their feelings of constraint increased across the transition to parenting (Kamp Dush & others, 2014)
- Expanded coverage of the types of behaviors infants and parents engage in when reciprocal socialization is occurring
- New commentary about how the expectations parents have for their toddlers' behavior are likely higher than the toddlers' ability to control their behavior and impulses based on what is known about the maturation of the prefrontal cortex
- Description of a recent national poll that estimated there are 2 million stay-at-home dads in the United States, a significant increase from 1.6 million in 2004 and 1.1 million in 1989 (Livingston, 2014)
- Added commentary that infants and toddlers are more likely to be found in family child care and informal care settings while older children are more likely to be in child care centers and preschool and early education programs
- Description of a recent Australian study in which higher-quality child care at 2 to 3 years of age was linked to children's better self-regulation of attention and emotion at 4 to 5 and 6 to 7 years of age (Gialamas & others, 2014)

Chapter 7: Physical and Cognitive Development in Early Childhood

- Description of a recent study that found positive effects of growth hormone treatment across five years for children born small for gestational age (Ross & others, 2015)
- Coverage of a recent research review that concluded an accurate assessment of growth hormone deficiency is difficult and that many children diagnosed with the deficiency retest normal later in childhood (Murray, Dattani, & Clayton, 2016)
- Discussion of recent research in which myelination in a number of brain areas was linked to young children's processing speed (Chevalier & others, 2015)
- Inclusion of recent research on how poverty is linked to maturational lags in children's frontal and temporal lobes, and these lags were associated with lower school readiness skills (Meyers & others, 2015)
- Description of a recent study that revealed higher levels of maternal sensitivity in early childhood were related to higher total brain volume in children (Kok & others, 2015)
- Coverage of a recent study of 36- to 42-month-old children in which consistent bedtime routine was linked to more nightly sleep and an increase in nightly sleep minutes across a 6-month period (Staples, Bates, & Petersen, 2015)
- Description of a recent study of 2- to 5-year-olds that revealed each additional hour of daily screen time was associated with decreased sleep time, less likelihood of sleeping 10 hours or more per night, and later bedtime (Xu & others, 2016)
- Inclusion of recent research in China that revealed preschool children who slept seven hours per day or less had worse school readiness profiles and that children who used electronic devices three hours per day or more had shortened sleep durations (Tso & others, 2015)
- New research that indicated preschool children who had longer sleep duration were more likely to have better peer acceptance, social skills, and receptive vocabulary (Vaughn & others, 2015)
- Coverage of a recent study that found 4-year-old children who had insomnia were characterized by hostile-aggressive and hyperactive-distractive problems (Armstrong & others, 2015)
- Discussion of a recent study in which viewing as little as one hour of television daily was associated with an increase in body mass index (BMI) between kindergarten and the first grade (Peck & others, 2015)
- Recent description by expert panels from Australia, Canada, the United Kingdom, and the United States that were remarkably similar in recommending that young children get an average of 15 or more minutes of physical activity per hour over a 12-hour period, or about 3 hours total per day (Pate & others, 2015)
- Updated data on the main causes of death in early childhood (Centers for Disease Control and Prevention, 2013)
- Discussion of recent research that found preschool sustained attention was linked to a greater likelihood of completing college by 25 years of age (McClelland & others, 2013)
- Description of a recent study that revealed executive function was an important predictor of preschool mathematical skills (Verdine & others, 2014)
- New coverage of developmental changes in executive function in early childhood, including recent research on executive function and school readiness (Willoughby & others, 2016)
- Expanded and updated coverage of longitudinal research that revealed connections between delay of gratification in early childhood and achievement in college, and career earnings and happiness in adulthood (Mischel, 2014; Moffitt, 2012)
- Coverage of a recent study of young children that found executive function was associated with emergent literacy and vocabulary development (Becker & others, 2014)
- Inclusion of research in which secure attachment to mothers during the toddler years was linked to a higher level of executive function at 5 to 6 years of age (Bernier & others, 2015)
- Discussion of a recent observational study that found a higher level of control by fathers predicted a lower level of executive function in 3-year-olds (Meuwissen & Carlson, 2016)
- Description of recent research in which executive function at 3 years of age predicted theory of mind at 4 years of age and executive function at 4 years of age predicted theory of mind at 5 years of age, but the reverse did not occur—theory of mind at earlier ages did not predict executive function at later ages (Marcovitch & others, 2015)

- Expanded and updated coverage of factors that influence children's theory of mind development: prefrontal cortex functioning (Powers, Chavez, & Hetherington, 2015) and various aspects of social interaction (Hughes & Devine, 2015), including secure attachment and mental state talk, and having older siblings and friends who engage in mental state talk
- Coverage of recent research in which 60 minutes of physical activity per day in preschool academic contexts improved young children's early literacy (Kirk & Kirk, 2016)
- Inclusion of a recent study that found Latino children living in low-income communities who began the school year having at-risk pre-academic and behavioral skills benefited from a Montessori public pre-K program, ending the year scoring above national averages for school readiness (Ansari & Winsler, 2014)
- Discussion of a recent study in which Early Head Start provided language benefits for young children (Love & others, 2015)
- Description of a recent study that revealed neighborhood poverty was linked to lower levels of classroom quality in Head Start programs (McCoy & others, 2015)
- New content on the correlational nature of research on punishment, as well as bidirectional, reciprocal socialization influences that take into account child characteristics and problems (Laible, Thompson, & Froimson, 2015; Sheehan & Watson, 2008)
- Coverage of a recent study in which unmarried African American parents who were instructed in coparenting techniques during the prenatal period and also one month after the baby was born had better rapport, communication, and problem-solving skills when the baby was 3 months old (McHale, Salman-Engin, & Covert, 2015)
- Updated data on the number of U.S. children who were victims of child maltreatment in 2013 (U.S. Department of Health and Human Services, 2015)
- Discussion of a recent study in which individuals who had experienced their parents' divorce were more at risk for engaging in a lifetime suicide attempt (Alonzo & others, 2015)
- Inclusion of a 30-year longitudinal study that found offspring of parents who engaged in child maltreatment and neglect are at increased risk for engaging in child neglect and sexual maltreatment themselves (Widom, Czaja, & Dumont, 2015)

Chapter 8: Socioemotional Development in Early Childhood

- Inclusion of revisions based on feedback from leading expert Jennifer Lansford
- Expanded coverage of the importance of emotion regulation in childhood and links between emotion regulation and executive function (Calkins & Perry, 2016; Durlak, Comitrovich, & Gullotta, 2015; Griffin, Freund, & McCardle, 2015)
- Description of a recent study of 5- to 7-year-olds in which understanding others' emotions was linked to their own emotion regulation (Hudson & Jacques, 2014)
- Inclusion of recent research in which young children's sympathy predicted whether they would share with others (Ongley & Malti, 2014)
- Discussion of a recent study that found parents' talk about emotions was associated with toddlers' sharing and helping behavior (Brownell & others, 2013)
- Inclusion of recent research in which maladaptive marital conflict when children were 2 years old was associated with increased internalizing problems 8 years later due to an undermining of attachment security in girls, while negative emotional aftermath of conflict increased both boys' and girls' internalizing problems (Brock & Kochanska, 2016)
- Coverage of a recent survey of American parents that revealed about half of fathers and one-fourth of mothers felt they were not spending enough time with their children (Pew Research, 2013)
- Description of recent research in which young children with authoritative parents were less likely to be obese than their counterparts with authoritarian parents (Kakinami & others, 2015)
- Inclusion of new information that physical punishment is outlawed in 41 countries (Committee on Rights of the Child, 2014)
- New research indicating that childhood divorce was linked to worse cohabiting/marital relationships from 16 to 30 years of age, but that these associations were influenced by a variety of factors, such as childhood sexual abuse and lower SES status of the child at birth (Fergusson, McLeod, & Harwood, 2014)
- Inclusion of recent research in which children were more likely to have behavior problems if their post-divorce environment was less supportive and stimulating, their mother was less sensitive and more depressed, and if their household income was lower (Weaver & Schofield, 2015). Also in this study, a higher level of predivorce maternal sensitivity and child IQ served as protective factors in reducing child problems after the divorce.
- Coverage of a longitudinal study that revealed parental divorce experienced prior to 7 years of age was linked to a lower level of the children's health through 50 years of age (Thomas & Hognas, 2015)
- Description of recent research on almost 3,000 adolescents that revealed a negative association of the father's, but not the mother's, unemployment on the adolescents' health (Bacikov-Sleskova, Benka, & Orosova, 2015)
- Discussion of a recent study that found when mothers coached their preschool daughters about the negative aspects of peer conflicts involving relational aggression, the daughters engaged in lower rates of relational aggression (Werner & others, 2014)
- Inclusion of a recent research review that concluded higher screen time was associated with a lower level of cognitive development in early childhood (Carson & others, 2015)
- Coverage of a study in which a higher degree of parental monitoring of children's media use was linked to a number of positive outcomes in children's lives (Gentile & others, 2014)

- Description of a study that found parental reduction in their own screen time was associated with a decrease in child screen time (Xu, Wen, & Rissel, 2015)
- Discussion of a recent study of preschool children in which each additional hour of screen time was linked to less nightly sleep, later bedtime, and being less likely to sleep 10 or more hours per night (Xu & others, 2016)
- New coverage of recommendations by Kathy Hirsh-Pasek and her colleagues (2015) for the best type of educational applications (apps) for young children: apps that are characterized by active involvement, engagement, meaningfulness, and social interaction
- Inclusion of recent research on children in which higher viewing of TV violence, video game violence, and music video violence was independently associated with a higher level of physical aggression (Coker & others, 2015)

Chapter 9: Physical and Cognitive Development in Middle and Late Childhood

- Inclusion of a recent Chinese study that found higher blood pressure in 23 percent of boys and 15 percent of girls was attributable to being overweight or obese (Dong & others, 2015)
- Description of a 14-year longitudinal study in which parental weight gain predicted children's weight change (Andriani, Liao, & Kuo, 2015)
- Coverage of a study that found both a larger waist circumference and a higher body mass index (BMI) combined to place children at higher risk for developing cardiovascular disease (de Koning & others, 2015)
- Updated statistics on the percentage of U.S. children who have ever been diagnosed with ADHD (American Psychiatric Association, 2013; Centers for Disease Control and Prevention, 2016)
- New research that revealed the dopamine transporter gene DAT 1 was involved in decreased cortical thickness in the prefrontal cortex of children with ADHD (Fernandez-Jaen & others, 2015)
- Inclusion of recent research in which a higher physical activity level in adolescence was linked to a lower level of ADHD in emerging adulthood (Rommel & others, 2015)
- Description of a recent meta-analysis that concluded short-term aerobic exercise is effective in reducing symptoms such as inattention, hyperactivity, and impulsivity (Cerillo-Urbina & others, 2015)
- Coverage of a recent meta-analysis in which exercise was associated with better executive function in children with ADHD (Vysniauske & others, 2016)
- Discussion of a recent meta-analysis in which mindfulness training significantly improved the attention of children with ADHD (Cairncross & Miller, 2016)
- Update on the percentage of children with a disability who spend time in a regular classroom (*Condition of Education*, 2015)
- New commentary about working memory developing so slowly that even by 8 years of age, children can only hold in memory half the items that adults can remember (Kharionova, Winter, & Sheridan, 2015)
- Coverage of two recent studies that found better working memory was linked to various aspects of reading and math achievement (Blankenship & others, 2015; Jaroslawska & others, 2016)
- New research that found a working memory training program improved the arithmetic problem-solving skills of 8- to 10-year-olds (Cornoldi & others, 2015)
- Description of recent research in which children's verbal working memory was linked to skills of both first- and second-language learners in morphology, syntax, and grammar (Verhagen & Leseman, 2016)
- Coverage of a recent working memory training program that improved the listening comprehension skills of first-grade children (Peng & Fuchs, 2016b)
- Discussion of a recent study in which a social and emotional learning program focused on mindfulness and caring for others was effective in improving a number of fourth- and fifth-grade students' cognitive processes, including mindfulness and cognitive control (Schonert-Reichl & others, 2015)
- Expansion of the activities that improve executive function to include aerobic exercise (Hillman, 2014), scaffolding of self-regulation (Bodrova & Leong, 2015), mindfulness training (Gallant, 2016; Schonert-Reichl & others, 2015), and some types of school curricula (Montessori training, for example) (Diamond & Lee, 2011)
- Coverage of recent research in which mindfulness training improved children's attention and self-regulation (Poehlmann-Tynan & others, 2016), achievement (Singh & others, 2016), and coping strategies in stressful situations (Dariotis & others, 2016)
- Discussion of a recent study that found a mindfulness-based intervention reduces public school teachers' stress (Taylor & others, 2016)
- Updated description of the most recent editions of the various Wechsler intelligence scales
- Description of a recent study using Stanford-Binet intelligence scales that found no differences between non-Latino White and African American preschool children when they were matched for age, gender, and level of parent education (Dale & others, 2014)
- Description of a recent meta-analysis that revealed a correlation of +.54 between intelligence and school grades (Roth & others, 2015)
- Coverage of a recent analysis that concluded the underrepresentation of African Americans in STEM subjects and careers is linked to practitioners' assumption that they have less innate talent than non-Latino Whites (Leslie & others, 2015)
- Discussion of a recent study that revealed parents and teachers rated elementary school children who are not gifted as having more emotional and behavioral problems than children who are gifted (Eklund & others, 2015)
- Revisions in the coverage of language development based on recommendations by leading expert Mandy McGuire

- Revised and updated content on bilingualism, including information about whether parents of infants and young children should teach them two languages simultaneously (Bialystok, 2014, 2015)
- New description of the rate at which bilingual and monolingual children learn language(s) (Hoff, 2016) and inclusion of a recent study that found by 4 years of age children who continued to learn Spanish and English had a total vocabulary growth that was greater than that of monolingual children (Hoff & others, 2014)

Chapter 10: Socioemotional Development in Middle and Late Childhood

- Coverage of a recent developmental study indicating that older children are less trusting and better at explaining the reasons to doubt sources that might distort claims than younger children are (Mills & Elashi, 2014)
- Discussion of a recent longitudinal study in which self-esteem predicted subsequent changes in social support but not the reverse (Marshall & others, 2014)
- Description of a recent study that found narcissistic parents especially overvalue their children's talents (Brummelman & others, 2015)
- Inclusion of recent research in which higher levels of self-control at 4 years of age were linked to improvements in math and reading achievement in the early elementary school years for children living predominantly in rural and low-income contexts (Blair & others, 2015)
- New content on how during middle and late childhood, as part of their understanding of emotions, children can engage in "mental time travel" in which they anticipate and recall the cognitive and emotional aspects of events (Lagattuta, 2014a, b; Lagattuta & others, 2015)
- New commentary on how children who have developed a number of coping techniques have the best chance of adapting and functioning competently after disasters and traumas (Ungar, 2015)
- Inclusion of revisions based on leading expert Sam Hardy's feedback
- New section on Jonathan Haidt's (2013) criticism of Kohlberg's view of moral reasoning as always conscious and deliberate, and his lack of attention to the automatic, intuitive precursors of moral reasoning
- New section on the criticism that Kohlberg's moral development theory ignores the importance of emotion in moral thinking
- Added conclusion to criticisms of Kohlberg's theory that although it is an important theory of moral development it is no longer as influential and dominant as it once was
- Description of a recent study in which a higher level of moral identity was found to possibly reduce the negative effects of moral disengagement and low self-regulation (Hardy, Bean, & Olsen, 2015)
- Added commentary that the point of conducting research on moral exemplars is to study the ideal end point of moral development
- Updated data from the National Assessment of Educational Progress (2013) regarding gender similarities and differences in reading scores
- New commentary about the multiple factors that may contribute to gender differences in academic achievement in areas such as reading and math (Eccles, 2014; Wigfield & others, 2015)
- Coverage of a longitudinal study in which preschool relational aggression predicted adolescent relational aggression for girls but not for boys (Nelson & others, 2014)
- Inclusion of information from a meta-analysis in which females are better than males at recognizing nonverbal displays of emotion (Thompson & Voyer, 2014)
- New content on peer rejection being consistently linked to the development and maintenance of conduct problems (Chen, Drabick, & Burgers, 2015)
- Coverage of a recent study that revealed peer victimization during elementary school was linked to stress and suicidal ideation (Kowalski & others, 2014)
- Discussion of a recent analysis that concluded bullying can have long-term effects, including problems at work and difficulty establishing long-term relationships (Wolke & Lereya, 2015)
- Inclusion of information from a recent meta-analysis in which traditional bullying occurred twice as much as cyberbullying and that those who engaged in cyberbullying were often likely also to have engaged in traditional bullying (Modecki & others, 2014)
- Coverage of recent research that found cyberbullying was more strongly associated with suicidal ideation than traditional bullying (van Geel, Vedder, & Tanilon, 2014)
- Expanded and updated bullying intervention recommendations to include the recent book *Bullying Beyond the Schoolground: Preventing and Responding to Cyberbullying* (Hinduja & Patchin, 2015)
- New research review that found antibullying interventions focused on the whole school, such as Olweus', were more effective than interventions involving classroom curricula or social skills training (Cantone & others, 2015)
- New coverage of the recently developed Common Core Standards Initiative to provide more detailed guidelines and milestones for students to achieve at each level, and the controversy the Standards have generated (Common Core State Standards Initiative, 2016)
- New content on the *Every Student Succeeds Act (ESSA)* that became U.S. law in December 2015 (Rothman, 2016). This law replaces *No Child Left Behind* and while not totally eliminating state standards for testing students, reduces their influence. The new law also allows states to opt out of Common Core standards.
- New discussion of recent research in which underachieving high school students who read online modules about how the brain changes when people learn and study improved their grade point averages (Paunesku & others, 2015)
- Description of a longitudinal study of university students in which a nonlimited mindset predicted better self-regulation and higher grades (Job & others, 2015)

- New coverage of Eva Pomerantz' (2015) parenting recommendations related to students' motivation in school
- Discussion of a recent study that found young Chinese adolescents have a greater sense of responsibility to parents than do their U.S. counterparts, with the U.S. students' sense of responsibility, but not the Chinese students', declining across two years (Qu & Pomerantz, 2015)

Chapter 11: Physical and Cognitive Development in Adolescence

- Coverage of a recent study in which aspects of early maturation and progression through puberty were linked to later height outcomes differently for boys and girls (Yousefi & others, 2013)
- Description of a recent study of 9- to 17-year-old boys that found testosterone levels peaked at 17 years of age (Khairullah & others, 2014)
- Inclusion of recent research that documented the growth of the pituitary gland during adolescence and found that its volume was linked to circulating blood levels of estradiol and testosterone (Wong & others, 2014)
- Description of a recent research review that concluded there is insufficient quality research to confirm that changing testosterone levels in puberty are linked to adolescent males' mood and behavior (Duke, Glazer, & Steinbeck, 2014)
- Inclusion of a recent study of Chinese girls that confirmed childhood obesity contributed to an earlier onset of puberty (Zhai & others, 2015)
- Coverage of a recent study that found early maturation predicted a stable higher level of depression for adolescent girls (Rudolph & others, 2015)
- Discussion of a recent study that revealed early-maturing Chinese boys and girls engaged in delinquency more than their on-time or late-maturing counterparts (Chen & others, 2015)
- New discussion of neurotransmitter changes in adolescence, particularly increased dopamine production (Monahan & others, 2016)
- Description of a recent national survey of 15- to 20-year-old Spanish-speaking immigrant youth that compared their sexual behavior with that of adolescents from ethnic groups (Haderxhanaj & others, 2014)
- Inclusion of recent research in which difficulties and disagreements between Latino adolescents and their parents were linked to the adolescents' early sex initiation (Cordova & others, 2014)
- Updated national data on the percentages of adolescents at different age levels who have engaged in sexual intercourse, including gender and ethnic variations as well as updates in Figure 5 (Kann & others, 2014)
- Description of a recent Swedish study of more than 3,000 adolescents indicating that sexual intercourse prior to age 14 was linked to a number of risky sexual behaviors at age 18 (Kastbom & others, 2016)
- Discussion of a recent study of a number of parenting practices that found the factor that best predicted a lower level of risky sexual behavior by adolescents was supportive parenting (Simons & others, 2016)
- Coverage of a recent meta-analysis focusing on how the link between impulsivity and adolescent sexual behavior differs for boys and girls (Dir, Coskunpinar, & Cyders, 2014)
- New research indicating that adolescent males who play sports engage in more risky sexual behavior, while adolescent females who play sports engage in less risky sexual behavior (Lipowski & others, 2015)
- Updated data on the percentage of adolescents who use contraceptives when they have sexual intercourse (Kann & others, 2014)
- Inclusion of a recent cross-cultural study of adolescent pregnancy rates in 21 countries (Sedgh & others, 2015)
- Updated statistics on the continuing decline in overall adolescent pregnancy rates in the United States and the decline in all ethnic groups, including updates in Figure 7 (Martin & others, 2015)
- Description of recent research that indicated higher levels of maternal education were linked to children's reading and math achievement through the eighth grade but the achievement of adolescent mothers' children never reached the levels of non-adolescent mothers' children (Tang & others, 2015)
- Coverage of a recent study of African American teen versus nonteen mothers' and fathers' long-term life outcomes in a number of areas (Assini-Meytim & Green, 2015)
- Updated information about the continuing drop in vegetable and fruit consumption by U.S. adolescents through 2013 (Kann & others, 2014)
- Description of a recent study in which family meals during adolescence protected against being overweight or obese in adulthood (Berge & others, 2015)
- Updated national data on adolescents' exercise patterns, including gender and ethnic variations (Kann & others, 2014)
- Inclusion of recent research in which an exercise program of 180 minutes per week improved the sleep patterns of obese adolescents (Mendelson & others, 2016)
- Discussion of a recent study in which a high-intensity exercise program decreased the depressive symptoms and improved the moods of depressed adolescents (Carter & others, 2016)
- Updated national data on adolescents' sleep patterns, including developmental changes (Kann & others, 2014)
- Coverage of a large-scale study of more than 270,000 adolescents from 1991 to 2012 that found adolescents have been decreasing the amount of sleep they get in recent years (Keyes & others, 2015)
- Description of recent Swedish studies of 16- to 19-year-olds in which shorter sleep duration was associated with a greater likelihood of school absence and shorter sleep duration and sleep deficit were the best sleep predictors of having a low grade point average (Hysing & others, 2015, 2016)
- New discussion attributing adolescents' sleep debt to electronic media usage and caffeine intake, changes in the brain, and early school start times (Owens, 2014)

- Discussion of a recent study that revealed early school start times were linked to a higher vehicle crash rate by adolescent drivers (Vorona & others, 2014)
- Inclusion of the recent recommendation by the American Academy of Pediatrics that schools institute start times from 8:30 to 9:30 a.m. to improve students' academic performance and quality of life (Adolescent Sleep Working Group, AAP, 2014)
- Updated coverage of the Monitoring the Future study's assessment of drug use by secondary school students with 2014 data on U.S. eighth-, tenth-, and twelfth-graders (Johnston & others, 2016)
- Discussion of a recent national study that found one in four twelfth-graders reported that they had consumed alcohol mixed with energy drinks, and this combination was linked to their unsafe driving (Martz, Patrick, & Schulenberg, 2015)
- New coverage of adolescents' use of e-cigarettes, including a description of their characteristics and their inclusion in the University of Michigan Monitoring the Future study for the first time in 2014 (Johnston & others, 2015a). In this study, e-cigarette use surpassed tobacco cigarette use by U.S. adolescents
- Discussion of a recent study that found early onset of drinking and a quick progression to drinking to intoxication were linked to drinking problems in high school students (Morean & others, 2014)
- Description of a longitudinal study in which earlier age at first use of alcohol was linked to risk of heavy alcohol use in early adulthood (Liang & Chikritzhs, 2015)
- New research that revealed early- and rapid-onset trajectories of alcohol, marijuana, and substance use were associated with substance use in early adulthood (Nelson, Van Ryzin, & Dishion, 2015)
- Discussion of a recent study in which adolescents took greater risks when they were with three same-aged peers than when they were alone (Silva, Chein, & Steinberg, 2016)
- Updates in the discussion of information processing in adolescence based on recommendations by leading expert Valerie Reyna
- Updated coverage of the fuzzy-trace theory dual-process model of adolescent decision making (Reyna & others, 2016; Reyna & Zayas, 2014)
- Inclusion of recent research that found how quickly adolescents get the gist of a dangerous situation is very important in reducing risky decision making (Reyna & Zayas, 2014)
- New content on why the transition to high school may produce problems for students (Eccles & Roeser, 2016)
- Updated data on school dropouts with a continuing decline in dropout rates for various ethnic groups (Child Trends, 2014; National Center for Education Statistics, 2014)
- Description of a recent study that found low and decreasing self-esteem during adolescence was linked with adult depression two decades later (Steiger & others, 2014)
- New coverage of the narrative approach to identity, which involves examining identity by having individuals tell their life stories and then evaluating the extent to which the stories are meaningful and integrated (McAdams & Zapata-Gietl, 2015; Singer & Kasmark, 2015)
- Inclusion of a recent study that examined identity domains using both identity status and narrative approaches, with the interpersonal domain (especially dating and friendship aspects) frequently mentioned (McLean & others, 2016). In the narrative approach, family stories were common.
- Coverage of two recent studies that found a strong and positive ethnic identity was linked to a lower incidence of substance abuse and psychiatric problems (Anglin & others, 2016; Grindal & Nieri, 2016)
- Description of recent research that revealed that as adolescents got older their religious attendance declined and this decline was linked to such factors as becoming employed, leaving home, and engaging in sexual activity (Hardie, Pearce, & Denton, 2016)
- Coverage of a recent meta-analysis that found a higher level of parental monitoring and rule enforcement were linked to later initiation of sexual intercourse and greater use of condoms by adolescents (Dittus & others, 2016)
- New research indicating that 10- to 18-year-olds' lower disclosure to parents was linked to antisocial behavior (Chriss & others, 2015)
- Discussion of a recent study in which parental psychological control was linked to decreases in adolescents' autonomy and relatedness with friends and romantic partners (Ouderkerk & others, 2015)
- Description of a study in which high parent-adolescent conflict was associated with a lower level of empathy across a six-year period (Van Lissa & others, 2015)
- Inclusion of a recent study that found a higher level of parent-adolescent conflict was linked to higher anxiety, depression, and aggression, and lower self-esteem (Smokowski & others, 2015a)
- New research on Chinese American families that revealed parent-adolescent conflict was linked to a sense of alienation between parents and adolescents, which in turn was related to more depressive symptoms, delinquent behavior, and lower academic achievement (Hou, Kim, & Wang, 2016)
- Coverage of a recent study in which having friends who engage in delinquency is associated with early onset and more persistent delinquency (Evans, Simons, & Simons, 2015)
- New information from a research review with details about the complexities of why media multitasking can interfere with learning and driving (Courage & others, 2015)
- Description of a recent study in which family therapy improved juvenile court outcomes beyond what was achieved in nonfamily-based treatment (Dakof & others, 2015)
- New content on the link between low academic success and delinquency (Mercer & others, 2015) and the association of

Chapter 12: Socioemotional Development in Adolescence

- Changes made based on leading expert Kate McLean's recommendations

cognitive factors, such as low self-control, with delinquency (Fine & others, 2016)

- New coverage of the roles of stress and loss in adolescent depression and inclusion of a recent study that found adolescents who became depressed were characterized by a sense of hopelessness (Weersing & others, 2016)
- New description of a recent study that found adolescent girls' greater experience of interpersonal dependent stress was linked to their higher level of rumination, which accounted for their higher level of depressive symptoms than boys (Hamilton & others, 2015)
- Discussion of recent research in which poor family relationship quality was linked to a faster increase in adolescents' symptoms of anhedonia (Kouros & others, 2014)
- Inclusion of recent research that revealed positive parenting characteristics were associated with less depression in adolescents (Smokowski & others, 2015b)
- New information from a research review that concluded SSRIs show clinical benefits for adolescents at risk for moderate and severe depression (Cousins & Goodyer, 2015)
- Updated data on the percentage of U.S. adolescents who seriously consider suicide each year (Kann & others, 2014)
- Inclusion of recent research in which both depression and hopelessness were predictors of whether adolescents repeated a suicide attempt across a six-month period (Consoli & others, 2015)
- Coverage of a recent study that found child maltreatment was linked to adolescent suicide attempts (Hadland & others, 2015)
- New research in which a lower level of school connectedness was associated with increased suicidal ideation in female and male adolescents, and with suicide attempts by female adolescents (Langille & others, 2015)
- Discussion of a recent study that found depressed suicide attempters were characterized by greater anhedonia severity (Auerbach & others, 2015)
- Description of a recent study in which more recent and frequent substance use among young adolescents increased the likelihood of suicidal ideation and attempts in African American youth (Tomek & others, 2015)
- Inclusion of recent results from the Fast Track early intervention study, which found that the early intervention was effective in reducing violent and drug crimes at age 25, and also increasing well-being at age 25 (Dodge & others, 2015)

Chapter 13: Physical and Cognitive Development in Early Adulthood

- Description of a recent Danish study focused on the most widely described markers of emerging adulthood (Arnett & Padilla-Walker, 2015)
- New commentary that 70 percent of college students do not get adequate sleep and 50 percent report daytime sleepiness (Hershner & Chervin, 2015)
- Inclusion of information from a recent national survey indicating that 29.5 percent of U.S. 20- to 39-year-olds are overweight and 31.5 percent are obese (Dietary Guidelines Advisory Committee, 2015)

- Discussion of recent international comparisons of 33 countries in which the United States had the highest percentage of obese adults (35.3 percent) and Japan the lowest percentage (3.7); the average of the countries was 23.2 percent of the population being obese (OECD, 2015)
- Updated coverage of genetic influences on obesity (Gogl & others, 2016; Zhou & others, 2015) and inclusion of recent research that found high activity levels reduced the genetic linkage for obesity in same-sex twins (Horn & others, 2015)
- Recent research on the atypical features of depression in overweight/obese adults (Lojko & others, 2015)
- Coverage of a recent meta-analysis in which moderate and vigorous aerobic exercise resulted in a lower incidence of major depressive disorder (Schuch & others, 2016b)
- Description of a recent study in which adults who regularly exercise had lower levels of anxiety and depression (Khanzada, Soomro, & Khan, 2015)
- Discussion of recent research that found a one-year exercise intervention decreased stress symptoms in working adults (Kettunen, Vuorimaa, & Vasankari, 2015)
- New discussion of e-cigarette use in emerging adulthood, including its frequency (Johnston & others, 2015b), recent research on risk factors for its use (Cohn & others, 2015), and e-cigarette users' views of emerging adulthood (Allen & others, 2015)
- Coverage of recent research indicating that 40 percent of 22-year-olds reported recently having had a casual sex partner (Lyons & others, 2015)
- Recent research on the main sexual scripts in 18- to 26-year-olds (Morrison & others, 2015)
- Description of a recent study that revealed when emerging adults drink alcohol, they are more likely to have casual sex and less likely to discuss possible risks (Johnson & Chen, 2015)
- Inclusion of recent research of more than 3,900 18- to 25-year-olds that found having casual sex was negatively linked to well-being and positively related to psychological distress (Bersamin & others, 2014)
- Updated data on global HIV and HIV in sub-Saharan Africa (UNAIDS, 2015)
- Inclusion of a recent meta-analysis that revealed 60 percent of rape victims do not acknowledge their rape, with an especially high percentage not acknowledging rape in the college years (Wilson & Miller, 2016)
- Coverage of a recent study in which males and heavy drinkers were more likely to adhere to rape myths than were women and non/light drinkers (Hayes, Abbott, & Cook, 2016)
- New description of a recent study in which the personality trait of openness to experience predicted creativity in the arts while intellect predicted creativity in the sciences (Kaufman & others, 2016)
- Inclusion of two recent studies indicating the importance of purpose in life in predicting well-being in emerging adulthood (Hill & others, 2016) and a lower incidence of cardiovascular disease and likelihood of living a longer life (Cohen, Bavishi, & Rozanski, 2016)

- Updated discussion of the job categories most likely to have an increase in openings through 2024 (Occupational Outlook Handbook, 2016/2017)
- New coverage of the unemployment rate of recent college graduates and the very high percentage who have to take jobs that do not require a college degree (Davis, Kimball, & Good, 2015; Gabor, 2014)
- Discussion of a recent study in which unemployment was associated with higher mortality but the link was stronger for those who were unmarried (Van Hedel & others, 2015)
- Inclusion of a longitudinal study that found low self-control in childhood was linked to the emergence and persistence of unemployment from 21 to 50 years of age (Daly & others, 2015)
- Description of recent research in which women reported more family interference from work than did men (Allen & Finkelstein, 2014)
- Inclusion of recent research in which partner coping, having a positive attitude about multiple roles, using planning and management skills, and not having to cut back on professional responsibilities were linked to better relationships between dual earners (Matias & Fontaine, 2015)
- Update on predictions of the increased percentage of various ethnic groups in the labor force through 2024 (Occupational Outlook Handbook, 2016/2017)

Chapter 14: Socioemotional Development in Early Adulthood

- Coverage of a recent study in which disinhibition in the toddler years was linked to career stability in middle adulthood (Blatney & others, 2015)
- Inclusion of recent research indicating that a high level of emotionality at 6 years of age was associated with depression in emerging adulthood (Bould & others, 2015)
- Discussion of a longitudinal study in which insecure avoidant attachment at 8 years of age was linked to negative social outcomes at 21 years of age (Fransson & others, 2016)
- Description of a recent study of adoptees that found higher maternal sensitivity in infancy and middle and late childhood predicted more secure attachment representations in emerging adulthood (Schoenmaker & others, 2015)
- Coverage of a recent study in which insecurely attached adults had a higher level of social anxiety than their securely attached counterparts (Notzon & others, 2016)
- Discussion of recent research that revealed young adults with an anxious attachment style were more likely to be characterized by higher negative affect, stress, and perceived social rejection; those with an avoidant attachment style were more likely to be characterized by less desire to be with others when alone (Sheinbaum & others, 2015)
- New research in which adults with a secure attachment style had fewer sleep disruptions than their counterparts with an insecure avoidant or insecure anxious attachment (Adams & McWilliams, 2015)
- Coverage of a recent study of first impressions that revealed when individuals encounter physically attractive persons

they overestimate their intelligence (Talamas, Mayor, & Perrett, 2016)

- Inclusion of a recent U.S. survey on the percentage of adults of different ages who had used online dating sites (Pew Research Center, 2015)
- Discussion of a recent study that confirmed declaring a relationship status on Facebook was associated with both romantic love and jealousy (Orosz & others, 2015)
- Updated data on U.S. marriage rates (Centers for Disease Control and Prevention, 2015), including the decreasing percentage of U.S. adults who have never been married (Wang & Parker, 2014)
- Description of recent research indicating that an increasing number of children are growing up with parents who never got married and that this is far more likely to occur when the mother has a low level of education (Gibson-Davis & Rackin, 2014; Pew Research, 2015)
- Updated statistics on the continuing increase in the number of U.S. adults that are cohabiting (Vespa, Lewis, & Kreider, 2013)
- Inclusion of recent data on the dramatic increase in cohabitation in Great Britain (Office for National Statistics, 2015)
- Coverage of a recent study that explored what U.S. never-married men and women are looking for in a potential spouse (Wang, 2014)
- Updated data on the continuing decline in the percentage of U.S. adults who are getting divorced (Centers for Disease Control and Prevention, 2015)
- Inclusion of a recent research review that concluded the experience of divorce or separation confers risk for poor health outcomes, including a 23 percent higher mortality rate (Sbarra, 2015)
- Description of a recent large-scale study in the United States and six European countries on the buffering effect of marriage on mortality for individuals who are not in the labor force (Van Hedel & others, 2015)
- Coverage of a recent research review that concluded divorced men and women are more likely to commit suicide than their married counterparts (Yip & others, 2015)
- Discussion of a recent study on the increased risk of heart attack for divorced adults, especially female divorced adults (Dupre & others, 2015)
- Inclusion of a recent study in which remarried adults had less frequent sex than those in their first marriage (Stroope, McFarland, & Uecker, 2015)
- Expanded coverage of strategies for coping with the stress of living in a remarried family (Bray, 2008; Sierra, 2015)
- Inclusion of content from a recent study that found greater sharing of responsibilities in same-sex than in different-sex couples (Matos & others, 2015)
- Updated data on the average age at which U.S. women have their first child (Martin & others, 2015)
- Inclusion of content from a recent Pew Research Center (2015) poll on the role of education in determining when U.S. women first became mothers

Chapter 15: Physical and Cognitive Development in Middle Adulthood

- Changes based on input from leading experts K. Warner Schaie, George Rebok, and David Almeida
- Update on the increasing percentage of the U.S. population over 65 years of age, which now is at 15 percent (U.S. Census Bureau, 2015)
- New commentary about middle adulthood not getting nearly as much research attention as late adulthood
- Description of recent data from the U.S. Census Bureau (2012) that indicate more than 102,000,000 U.S. adults are 40 to 64 years of age, which accounts for 33 percent of the U.S. population
- Inclusion of Margie Lachman and her colleagues' (2015) recent commentary about why middle age is a pivotal period in life
- Coverage of recent research that has shown a combination of adaptive biological and social factors can buffer physical and cognitive declines in middle adulthood (Agrigoroaei & Lachman, 2010; Lachman, Teshale, & Agrigoroaei, 2015; Puteman & others, 2013)
- Discussion of a recent study in which sarcopenic obesity was associated with a 24 percent increase in risk for all-cause mortality, with men having a higher risk than women (Tian & Xu, 2016)
- Description of a recent study that found middle-aged individuals who exercised regularly in adolescence were less likely to develop cardiovascular disease (Nechuta & others, 2015)
- Coverage of a recent study in which a high level of physical activity was associated with a lower risk of cardiovascular disease in all three weight categories studied (normal, overweight, and obese) (Carlsson & others, 2016)
- Inclusion of a recent national study that confirmed moderate-to-vigorous exercise on a regular basis was linked to reduced all-cause mortality, especially for men (Loprinzi, 2015a)
- Coverage of a recent study in which having an unhealthy diet was a strong predictor of cardiovascular disease (Menotti & others, 2015)
- Discussion of a recent study that found the most important health factor in predicting metabolic syndrome was a high triglyceride level (Worachartcheewan & others, 2015)
- Inclusion of new Korean study that linked a number of lifestyle factors to sleep problems in middle age (Yoon & others, 2015)
- Description of recent research in which poor sleep quality in middle adulthood was linked to cognitive decline (Waller & others, 2016)
- Coverage of recent research that found arthritis was a key factor in predicting adverse outcomes in middle-aged individuals with multiple chronic health conditions (Qin & others, 2015)
- Discussion of recent research indicating that how individuals react to daily stressors is linked to future health outcomes and longevity (Mroczek & others, 2015; Sin & others, 2015)
- Expanded and updated coverage of research by Janet Kiecolt-Glaser and her colleagues (Bennett, Fagundes, & Kiecolt-Glaser, 2016; Derry & others, 2015; Fagundes &

others, 2016; Jaremka & others, 2016; Kiecolt-Glaser & others, 2015) that focused on clarifying the effects of stress on the immune system in a number of contexts

- Discussion of recent research that revealed control can have long-term consequences for health status and mortality risk (Turiano & others, 2014)
- Updated data on deaths in middle age due to cancer and cardiovascular disease (Centers for Disease and Control, 2015)
- New research involving a large-scale study of more than 80,000 men linking testosterone replacement therapy with a reduction in cardiovascular disease and all-cause mortality (Sharma & others, 2015)
- Description of a recent study in which TRT was associated with increased longevity in men with a low level of testosterone (Comhaire, 2016)
- Updated data on the percentage of men 40 to 70 years of age and over 70 years of age who have erectile dysfunction (Mola, 2015)
- Coverage of a recent study in which higher abdominal fat mass and depression were risk factors for erectile dysfunction in 35- to 80-year-olds (Martin & others, 2015)
- Discussion of Timothy Salthouse's (2015) recent emphasis on the main reason for different age trends in longitudinal and cross-sectional comparisons of cognitive functioning being prior experience, with test scores improving the next time a test is taken
- Updated and expanded information about the percentage of U.S. 45- to 54- and 55- to 65-year-olds in the workforce, including trends from 2000 to 2015 (Short, 2015)
- Description of recent research that found engaging in physical and cognitive leisure activities after retirement decreased cognitive decline for individuals who worked in less cognitively challenging jobs prior to retirement (Andel, Finkel, & Pedersen, 2016)
- Inclusion of recent research in which middle-aged individuals who engaged in active leisure pursuits had a higher level of cognitive performance in late adulthood (Ihle & others, 2015)
- Coverage of a recent study that revealed individuals who engaged in a greater amount of sedentary screen-based leisure activity had shorter telomere lengths (Loprinzi, 2015b)
- Description of recent research that found leisure activity can serve as a positive coping strategy on days when individuals experience negative stressful events (Qian, Yamal, & Almeida, 2014a)

Chapter 16: Socioemotional Development in Middle Adulthood

- Description of a recent study in which stressful life events were associated with cardiovascular disease in middle-aged women (Kershaw & others, 2014)
- Discussion of a recent meta-analysis that revealed stressful life events were related to autoimmune diseases such as arthritis and psoriasis (Porcelli & others, 2016)
- Coverage of a recent study that found stressful daily hassles were linked to increased anxiety and lower physical well-being (Falconier & others, 2015)

- New discussion of Margie Lachman and her colleagues' (2015) recent views on how personal control changes when individuals move into middle age, including comparison of the factors involved in personal control for young people and middle-aged adults
- Revised organization of the discussion of the Big Five factors of personality describing research on each of the five factors separately
- Description of recent research that found individuals high in openness to experience have superior cognitive functioning across the life span (Briley, Domiteaux, & Tucker-Drob, 2014) and experience less negative affect to stressors (Leger & others, 2016)
- Inclusion of recent research that found conscientiousness was linked to superior problem-focused coping (Sesker & others, 2016), college students' grade point averages (McAbee & Oswald, 2013), greater success in accomplishing goals (McCabe & Fleeson, 2016), and better cognitive status and less cognitive decline in older adults (Luchetti & others, 2016)
- New conceptual and research content on the increasing interest in the role of conscientiousness in health and longevity (English & Carstensen, 2014; Friedman & others, 2014; Roberts & others, 2014)
- Coverage of recent research indicating that individuals high in extraversion are more satisfied with their relationships (Toy, Nai, & Lee, 2016), show less negative affect to stressors (Leger & others, 2016), and have a more positive sense of their future well-being (Soto & others, 2015)
- Discussion of recent research indicating that people high in agreeableness engage in more positive affect to stressors (Leger & others, 2016)
- Description of recent research linking high levels of neuroticism to a variety of outcomes, including drug dependency (Valero & others, 2014) and a lower sense of well-being 40 years later (Gale & others, 2014)
- Discussion of recent research indicating that a combination of higher conscientiousness and higher optimism is linked to better health (Turiano & others, 2013)
- New section on the personality-trait like characteristic of optimism and recent research on its link to better health and physical functioning in middle age (Boelen, 2015)
- Inclusion of a recent study in which a higher level of optimism improved the likelihood that individuals who had just experienced an acute coronary event would engage in more physical activity and have fewer cardiac readmissions (Huffman & others, 2016)
- Description of a recent research review of the influence of optimism on positive outcomes for individuals with chronic diseases through direct and indirect pathways (Avvenuti, Baiardini, & Giardini, 2016)
- Discussion of a recent study in which middle-aged married individuals have a lower likelihood of work-related health limitations than their counterparts who are not married (Lo, Cheng, & Simpson, 2016)
- Coverage of a recent study that found the life satisfaction of middle-aged women in low-quality marriages increased after their divorce (Bourassa, Sbarra, & Whisman, 2015)

Chapter 17: Physical Development in Late Adulthood

- Inclusion of revisions based on feedback from leading expert George Rebok
- Update on the increasing life expectancy in the United States, which was 78.8 years in 2013 (U.S. Department of Health and Human Services, 2015)
- Update on gender and ethnic differences in life expectancy in the United States (U.S. Department of Health and Human Services, 2015), including information about the ethnicity differences widening in recent years because of the powerful role of education, with some experts predicting that catch-up will be difficult (Olshansky & others, 2012)
- Updated data on the increasing number of U.S. centenarians, which reached 72,000 in 2014 (Xu, 2016)
- Description of a recent Georgia Centenarian Study that found physical health impairment and fewer social resources were linked to lower subjective well-being (Cho & others, 2015)
- Discussion of recent research that revealed differences in U.S. and Japanese centenarians (da Rosa & others, 2015)
- Coverage of a recent Chinese Longitudinal Healthy Longevity Study indicating that a higher level of education was linked to greater longevity (Luo, Zhang, & Guo, 2015)
- Inclusion of recent research that found a combination of particular FOXO genotypes and drinking tea were associated with the prevention of cognitive decline in the oldest old aged 92+ (Zeng & others, 2016)
- Description of a recent list (2015) of the oldest people who have ever lived, with the list having only two men (number 11 and number 17) in the top 25
- New criticism of the evolutionary theory of aging
- Coverage of a recent study in which greater leisure time screen-based sedentary behavior was linked to shorter telomere length (Loprinzi, 2015)
- Inclusion of recent interest in energy sensing and apoptosis as key aspects of the mitochondrial theory of aging (Gonzalez-Freire & others, 2015)
- Reorganization of the discussion of biological theories of aging to include a new heading, "Cellular Processes," with new content on the increasing interest in sirtuins (Covington & Bajpeyi, 2016; Giblin & Lombard, 2016) and the mTOR pathway (Chen & others, 2016a, b; Schreiber, O'Leary, & Kennedy, 2016) as key cellular processes in aging and longevity
- Description of a recent study in which the percentage of T cells decreased in older adults in their seventies, eighties, and nineties (Valiathan, Ashman, & Asthana, 2016)
- Inclusion of research indicating that global brain volume predicted mortality in adults (Van Elderen & others, 2016)
- Discussion of a recent study in which mice in an enriched environment learned more flexibly because of adult hippocampal neurogenesis (Garther, Roeder, & Kempermann, 2016)
- Updated coverage of facets of the brain responsible for a reduction in brain volume with aging (Van Elderen & others, 2016)

- Coverage of a study of individuals from 20 to 90 years of age in which total sleep decreased about 8 minutes per decade for males and about 10 minutes per decade for females (Dorffner, Vitr, & Anderer, 2015). In this study, as people aged they spent more time in light sleep and less time in deep sleep.
- Coverage of a recent study that revealed when older adults slept 6 hours per day or less they were more likely to have fair or poor health (Lauderdale & others, 2016)
- Description of a recent study in which engaging in regular aerobic exercise improved the sleep profiles of older men (Melancon, Lorrain, & Dionne, 2015)
- Discussion of a recent research review that concluded female gender, depressed mood, and physical illness were the most consistently identified risks for future sleep problems in older adults (Smagula & others, 2016)
- New content on the increasing conclusion that excessively long sleep duration per night (9 hours or more) is detrimental to older adults' cognitive functioning (DeVore, Gradstein, & Schernhammer, 2016; Malek-Ahmad & others, 2016)
- Inclusion of research in which even just one night of partial sleep deprivation activated DNA damage characteristic of biological aging (Carroll & others, 2015)
- Description of a recent study of older adults indicating that regular walking at or above 150 minutes per week predicted a lower likelihood of problems with sleep onset and sleep maintenance four years later (Hartescu, Morgan, & Stevinson, 2016)
- New content on the risk of falling in older adults, including a recent meta-analysis that revealed exercise reduces falls in adults 60 years and older (Stubbs, Brefka, & Denkginer, 2015) and another study that found walking was more effective than balance training in reducing falls in older adults (Okubo & others, 2016)
- Coverage of a recent study of older adults in which a faster walking pace, not smoking, modest alcohol intake, and avoiding obesity were associated with a lower risk of heart failure (Del Gobbo & others, 2015)
- Inclusion of a recent study of older adults that revealed walking a dog regularly was associated with better physical health (Curl, Bibbo, & Johnson, 2016)
- Coverage of a recent study of older adults that found poorer visual function was associated with having fewer social contacts and engaging in less-challenging social/leisure activities (Cimarolli & others, 2016)
- Description of recent research that indicated older adults' hearing problems are associated with less time spent out of home and in leisure activities (Mikkola & others, 2016), increased falls (Gopinath & others, 2016; Jiam, Li, & Agrawal, 2016), and loneliness (Mick & Pichora-Fuller, 2016)
- Inclusion of a national study of the percentage of community-dwelling older adults with touch, taste, and smell impairment (Carreira & others, 2016)
- Coverage of a recent study in which older adults with more severe pain performed more poorly on memory and executive function tasks than their older adult counterparts with no pain or less pain (van der Leeuw & others, 2016)
- Inclusion of recent research with sarcopenic older adults that found those who were physically active had a 25 percent probability of greater longevity than their sedentary counterparts (Brown, Harhay, & Harhay, 2016)
- Discussion of a recent research review that concluded more physically fit and active older adults have greater prefrontal cortex and hippocampal volume, a higher level of brain connectivity, more efficient brain activity, better memory, and a higher level of executive function (Erickson, Hillman, & Kramer, 2015)
- Description of a recent study that found differences between older adults and young adults in the way they portrayed themselves in their profiles on online dating sites (Davis & Fingerman, 2016)
- New research on women that indicated leisure-time physical inactivity was a risk factor for subsequent development of arthritis (Di Giuseppe & others, 2016)
- Inclusion of recent research of older adults in which moderate alcohol consumption was linked to greater volume in the brain's hippocampus (Downer & others, 2015)
- Coverage of a recent study of aging adults that found moderate wine consumption was associated with lower inflammatory risk factors related to cardiovascular disease across an 8-year period (Janssen & others, 2015)
- Updated data on the percentage of older adults who engage in regular exercise, which has increased substantially since 2006 (Centers for Disease Control and Prevention, 2015)
- Description of research on joggers in Denmark that revealed engaging in light or moderate jogging on a regular basis was linked to increased longevity (Schnohr & others, 2015)
- Inclusion of a recent study in which a higher level of aerobic fitness embedded in a health promotion program for older adults was linked to higher cortical and hippocampal volumes (Carlson & others, 2015)
- Discussion of a recent study in which core resistance and balance training improved older adult women's balance, muscle strength, leg power, and body composition better than Pilates training (Markovic & others, 2015)
- Inclusion of recent research on older adults indicating that those who engaged in regular physical activity following a heart attack were less depressed than their sedentary counterparts (Chao & others, 2015)
- Coverage of a study that revealed assisted living residents were less depressed after participating in a 4-week intervention involving Wii Fit Exergames than residents who were given a health education program instead (Chao & others, 2015)
- Inclusion of a recent conclusion that although the link between obesity and disease is present in older adults, the link is weaker than for young and middle-aged adults (Kalish, 2016)
- Description of recent research in which calorie restriction maintained more youthful functioning of the hippocampus, which is an important brain structure in memory (Schafer & others, 2015)
- Discussion of two recent research studies that found no link between antioxidant vitamin intake and mortality (Henriquez-Sanchez & others, 2016; Stepaniak & others, 2016)

Chapter 18: Cognitive Development in Late Adulthood

- Revisions based on feedback from leading experts K. Warner Schaie, George Rebok, William Hoyer, and Kristen Kennedy
- Description of a recent meta-analysis of processing speed through the life span (Verhaeghen, 2013)
- Coverage of a recent study in which slowing of processing speed was linked to the emergence of dementia over the next six years (Welmer & others, 2014)
- Discussion of a recent German study of 50- to 90-year-olds that found those who were tested more recently had a faster processing speed than their counterparts (at the same age) six years earlier (Steiber, 2015)
- Description of a recent large-scale study that found of 65 mortality risk factors, processing speed and health status were among the best predictors of living longer (Aichele, Rabbitt, & Ghisletta, 2016)
- Inclusion of a recent meta-analysis in which age-related losses in processing speed were explained by a decline in neural connectivity or indirectly through changes in dopamine, or both (Verhaeghen, 2013)
- Description of recent research that found age-related slowing in processing speed was linked to a breakdown of myelin in the brain (Lu & others, 2013)
- New commentary about the possibility that through their experience and wisdom some older adults may be able to offset some of the declines in vigilance
- Coverage of research in which episodic memory performance predicted which individuals would develop dementia 10 years prior to the clinical diagnosis of the disease (Boraxbekk & others, 2015)
- Discussion of recent research indicating that cognitive training can improve working memory (Cantarella & others, 2016) and fluid intelligence (Au & others, 2015)
- Description of a recent study in which planning strategies were associated with older adults' prospective memory (Wolff & others, 2016)
- Inclusion of a recent study that found executive function but not memory predicted a higher risk of coronary disease and stroke three years later (Rostamian & others, 2015)
- New research that indicated executive function predicted increases in self-rated health in community-dwelling older adults (McHugh & Lawlor, 2016)
- Discussion of a recent study in which executive dysfunction was a strong predictor of having a stroke in cognitively normal aging adults (Oveisgharan & Hachinski, 2015)
- Coverage of a recent study in which older adults assessed in 2013–2014 engaged in a higher level of abstract reasoning than their counterparts who were assessed two decades earlier (Gerstorff & others, 2015)
- Inclusion of a recent study that revealed working in an occupation with a high level of mental demands was linked to higher levels of cognitive functioning before retirement and a slower rate of cognitive decline after retirement (Fisher & others, 2014)
- New content on the Baltimore Experience Corps program that involves older adults volunteering in elementary schools and is linked to improved cognitive and brain functioning (Carlson & others, 2015; Parisi & others, 2012, 2014, 2015)
- Discussion of a recent research review in which Exergaming was linked to improved cognitive functioning in older adults (Ogawa, You, & Levelle, 2016)
- Description of recent research that found two aspects of depression (anhedonia and negative affect) were associated with cognitive decline in African Americans (Turner & others, 2015)
- Discussion of recent research on 60- to 90-year-olds in which iPad training 15 hours a week for 3 months improved their episodic memory and processing speed relative to engaging in social or nonchallenging activities (Chan & others, 2015)
- Inclusion of recent research indicating that computerized cognitive training can improve some cognitive processes in older adults (Lampit, Hallock, & Valenzuela, 2014; Suo & others, 2016)
- New research indicating that fish oil supplement use was linked to higher cognitive scores and less atrophy in one or more brain regions (Daiello & others, 2015)
- Updated information on brain training games based on the consensus of leading experts (Stanford Center for Longevity and Max Planck Institute for Human Development, 2014)
- Coverage of recent research in which cortical thickness in frontoparietal networks predicts executive function in older adults (Schmidt & others, 2016)
- Updated data on the dramatic increase in the percentage of older adults who are in the workforce and projections to 2020, including gender differences (Short, 2015)
- Updated data on the age at which individuals retire, with women's retirement age now very close to men's, especially for workers 65 years of age and older (Munnell, 2015)
- Expanded content on the diverse mix of pathways of work and retirement that individuals now pursue (Kojola & Moen, 2016)
- New content on the different mix of depressive symptoms that characterize older adults compared with younger adults (Edelstein & Segal, 2016)
- Description of a recent study in which older adults who engaged in the highest level of physical activity and participated in athletic activities were at a lower risk for depression (Joshi & others, 2016)
- Discussion of a recent study that revealed depressed older adults were less likely to receive treatment for depression than younger adults were (Sanglier & others, 2015)
- New coverage of two recent multifaceted interventions that reduced dementia risk for middle-aged and older adults (Anstey & others, 2015; Ngandu & others, 2015)
- New commentary that more than 60 percent of individuals with Alzheimer disease have at least one ApoE4 allele (Riedel, Thompson, & Brinton, 2016)

- New coverage of a recent meta-analysis of modifiable risk factors for Alzheimer disease, including some medical exposures, dietary factors, preexisting diseases, cognitive activity, and level of alcohol consumption (Xu & others, 2015)
- Inclusion of recent research that confirmed family caregivers' health-related quality of life deteriorated when they cared for a family member with Alzheimer disease (Valimaki & others, 2016)
- Description of a recent research review that concluded the most effective way to prevent elder maltreatment is by directly targeting physical restraint by long-term paid carers (Ayalon & others, 2016)

Chapter 19: Socioemotional Development in Late Adulthood

- Updated description of Bob Cousy's life and the extensive care he provided for his wife of 63 years who had developed dementia (Williamson, 2013)
- Discussion of a recent study of older adults with dementia in which reminiscence therapy reduced their depressive symptoms and improved their self-acceptances and positive relationships with others (Gonzales & others, 2015)
- Description of a recent study in which a variation of reminiscence therapy called *instrumental* reminiscence therapy improved the adaptive coping and resilience of older adults in adverse situations (Melendez & others, 2015)
- Coverage of a recent study in which attachment-focused reminiscence therapy reduced the depressive symptoms, perceived stress, and emergency room visits of older African Americans (Sabir & others, 2016)
- Description of a recent study that revealed older adults who increased their leisure-time activity were three times more likely to have a slower progression to functional disability (Chen & others, 2016)
- Inclusion of recent research in which aging adults kept diaries of their activities and those who were more physically active were more satisfied with their lives (Maher & others, 2015)
- Discussion of a recent study of 22- to 94-year-olds that found older adults showed selective optimization with compensation if they had a high level of cognitive resources (Robinson, Rickenbach, & Lachman, 2015)
- Description of a recent study in which older men showed more engagement with highly positive contexts than did younger men (Martins & others, 2016)
- Inclusion of new content about a recent large-scale examination of healthy living in different age groups by the Stanford Center on Longevity that found social engagement with individuals and communities appeared to be weaker today than it was 15 years ago for 55- to 64-year-olds (Parker, 2016)
- Coverage of a 13-year German longitudinal study focused on the self-esteem of older adults aged 70 to 103, including developmental changes and links with health problems and disabilities (Wagner & others, 2015)
- Description of a recent study in which older adults with more interests had higher self-esteem (Krause & Hayward, 2014)
- New commentary about concern for the increasing cost of Alzheimer disease, especially for women (Yang & Levey, 2015)
- Inclusion of research that revealed processing speed was slower for older adults living in poverty (Zhang & others, 2015)
- Updates on the percentage of U.S. older adults living in poverty, including gender and ethnicity differences (Cubanski, Casillas, & Damice, 2015; Gabe, 2015)
- Updated information about the percentage of older adults who are married (U.S. Census Bureau, 2015)
- Description of a recent study of married and cohabiting older adults that indicated negative relationship quality predicted a higher level of blood pressure when both members of the couple reported having negative relationship quality (Birditt & others, 2016)
- Discussion of recent research of 40- to 60-year-olds, who reported that their relationships with their children were more important than those with their parents but that their relationships with their children were more negative than with their parents (Birditt & others, 2015)
- Inclusion of recent research on 65-year-and-older adults that found having an iPad increased their family ties and sense of having a greater overall connection to society (Delello & McWhorter, 2016)
- Description of a recent study in which more frequent negative (but not positive) marital experiences were linked to a slower increase in older adults' cognitive limitations over time (Xu, Thomas, & Umberson, 2016)
- A recent study that found spousal support was more strongly linked to an important biomarker of biological aging, telomere length, than other forms of social support (Barger & Cribbet, 2016)
- Discussion of a recent study in which a higher level of social support was associated with older adults' increased life satisfaction (Dumitrache, Rubio, & Rubio-Herrera, 2016)
- Coverage of recent research that indicated emotional- and finance-related social support were linked to older adults' higher levels of physical activity (Loprinzi & Joyner, 2016)
- Description of recent research with older adults in which volunteering showed a strong link to lower incidence of cardiovascular disease and living longer (Han & others, 2016)
- New research that revealed having multiple chronic diseases was linked to a lower level of successful aging (Hsu, 2015)
- Inclusion of recent research on 90- to 91-year-olds that found living circumstances, independence, health, and a good death were associated with successful aging (Nosraty & others, 2015)
- Coverage of Laura Carstensen's (2015) recent commentary about the challenges and opportunities involved in the dramatic increase in life expectancy that has been occurring and continues to occur

Chapter 20: Death, Dying, and Grieving

- Revision changes based on feedback from leading expert Crystal Park
- New commentary that while the color black is associated with death in the United States, white is associated with death in China
- Updated information about two additional states (New Mexico and Vermont, which makes five overall) that allow assisted suicide
- New content on why euthanasia is so controversial
- Discussion of recent research that found 61 percent of dying patients were in pain in their last year of life and almost one-third had symptoms of depression and confusion prior to death (Singer & others, 2015)
- Description of a recent research review that concluded the three most frequent themes in articles on a good death involved: (1) preference for dying process, (2) pain-free status, and (3) emotional well-being (Meier & others, 2016)
- Coverage of recent research involving young and middle-aged adults that revealed women had more difficulty than men in adjusting to the death of a parent and also that women had a more intense grief response to a parent's death (Hayslip, Pruett, & Caballero, 2015)
- Description of a study in which older adults who were bereaved had more dysregulated cortisol patterns, indicative of the intensity of their stress (Holland & others, 2014)
- Discussion of recent research that found college students who lost someone close to them in college shootings and had severe posttraumatic stress symptoms four months later were more likely to have severe grief one year after the shootings (Smith & others, 2015)
- Discussion of a study of individuals diagnosed with complicated grief in which 40 percent reported having had at least one full or limited symptom grief-related panic attack in the past week (Bui & others, 2015)
- Coverage of recent research that found four meaning-making processes (sense making, benefit finding, continuing bonds, and identity reconstruction) in parent-physician bereavement meetings following a child's death (Meert & others, 2015)
- Updated data on the percentage of U.S. adult women and men 65 years and older who are widowed (Administration on Aging, 2014)
- Discussion of a recent study that found Mexican American older adults experienced a significant increase in depressive symptoms during the transition to widowhood (Monserud & Markides, 2016). In this study, frequent church attendance served as a protective buffer against increases in depressive symptoms.
- New commentary that becoming widowed is especially difficult when individuals have been happily married for a number of decades
- Updated data on the dramatic increase in the percentage of people in the United States who choose cremation (45 percent in 2013 compared with 27 percent in 2000 and 14 percent in 1985) (Cremation Association of America, 2015)

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EXPERT CONSULTANTS

As I develop a new edition of this text, I consult with leading experts in their respective areas of life-span development. Their invaluable feedback ensures that the latest research, knowledge, and perspectives are presented throughout the text. Their willingness to devote their time and expertise to this endeavor is greatly appreciated. The Expert Consultants who contributed to this edition, along with their biographies and commentary, can be found on pages xv–xvii.

REVIEWERS

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section one

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*All the world's a stage,
And all the men and women merely players.
They have their exits and their entrances;
and one man in his time plays many parts.*

—WILLIAM SHAKESPEARE
English playwright, 17th century

The Life-Span Perspective

This book is about human development—its universal features, its individual variations, its nature. Every life is distinct, a new biography in the world. Examining the shape of life-span development allows us to understand it better. *Life-Span Development* is about the rhythm and meaning of people's lives, about turning mystery into understanding, and about weaving a portrait of who each of us was, is, and will be. In Section 1, you will read the "Introduction."

INTRODUCTION

chapter outline

① The Life-Span Perspective

Learning Goal 1 Discuss the distinctive features of a life-span perspective on development.

The Importance of Studying Life-Span Development
Characteristics of the Life-Span Perspective
Some Contemporary Concerns

② The Nature of Development

Learning Goal 2 Identify the most important processes, periods, and issues in development.

Biological, Cognitive, and Socioemotional Processes
Periods of Development
The Significance of Age
Developmental Issues

③ Theories of Development

Learning Goal 3 Describe the main theories of human development.

Psychoanalytic Theories
Cognitive Theories
Behavioral and Social Cognitive Theories
Ethological Theory
Ecological Theory
An Eclectic Theoretical Orientation

④ Research on Life-Span Development

Learning Goal 4 Explain how research on life-span development is conducted.

Methods for Collecting Data
Research Designs
Time Span of Research
Conducting Ethical Research
Minimizing Bias



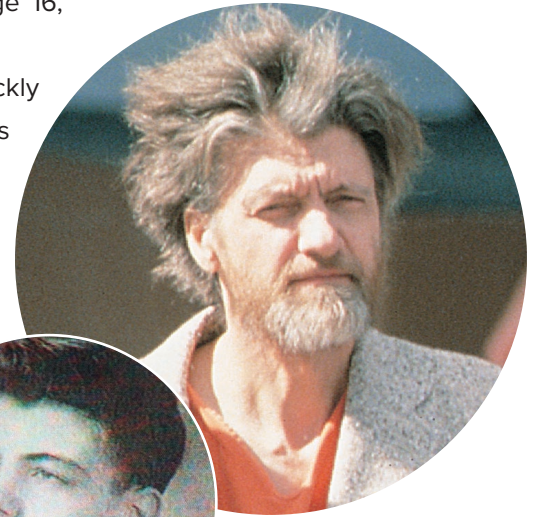
Ted Kaczynski sprinted through high school, not bothering with his junior year and making only passing efforts at social contact. Off to Harvard at age 16, Kaczynski was a loner during his college years.

One of his roommates at Harvard said that he avoided people by quickly shuffling by them and slamming the door behind him. After obtaining his Ph.D. in mathematics at the University of Michigan, Kaczynski became a professor at the University of California at Berkeley. His colleagues there remember him as hiding from social contact—no friends, no allies, no networking.

After several years at Berkeley, Kaczynski resigned and moved to a rural area of Montana where he lived as a hermit in a crude shack for 25 years. Town residents described him as a bearded eccentric. Kaczynski traced his own difficulties to growing up as a genius in a kid's body and sticking out like a sore thumb in his surroundings as a child. In 1996, he was arrested and charged as the notorious Unabomber, America's most-wanted killer. Over the course of 17 years, Kaczynski had sent 16 mail bombs that left 23 people wounded or maimed and 3 people dead. In 1998, he pleaded guilty to the offenses and was sentenced to life in prison.

A decade before Kaczynski mailed his first bomb, Alice Walker spent her days battling racism in Mississippi. She had recently won her first writing fellowship, but rather than use the money to follow her dream of moving to Senegal, Africa, she put herself into the heart and heat of the civil rights movement. Walker had grown up knowing the brutal effects of poverty and racism. Born in 1944, she was the eighth child of Georgia sharecroppers who earned \$300 a year. When Walker was 8, her brother accidentally shot her in the left eye with a BB gun. By the time her parents got her to the hospital a week later (they had no car), she was blind in that eye, and it had developed a disfiguring layer of scar tissue. Despite the counts against her, Walker overcame pain and anger and went on to win a Pulitzer Prize for her book *The Color Purple*. She became not only a novelist but also an essayist, a poet, a short-story writer, and a social activist.

Ted Kaczynski, the convicted Unabomber, traced his difficulties to growing up as a genius in a kid's body and not fitting in when he was a child.
© Seanna O'Sullivan



Ted Kaczynski, about age 15–16.
© WBBM-TV/AFP/Getty Images

Alice Walker won the Pulitzer Prize for her book *The Color Purple*. Like the characters in her book, Walker overcame pain and anger to triumph and celebrate the human spirit.
© AP Images



Alice Walker, about age 8.
Courtesy of Alice Walker

preview

What leads one individual, so full of promise, to commit brutal acts of violence and another to turn poverty and trauma into a rich literary harvest? If you have ever wondered why people turn out the way they do, you have asked yourself the central question we will be exploring. Consider this a window into the journey of human development—your own and that of every other member of the human species. In this chapter, we will explore what it means to take a life-span perspective on development, examine the nature of development, and outline how science helps us to understand it.

1 The Life-Span Perspective

LG1 Discuss the distinctive features of a life-span perspective on development.

The Importance of Studying Life-Span Development

Characteristics of the Life-Span Perspective

Some Contemporary Concerns

We reach backward to our parents and forward to our children, and through their children to a future we will never see, but about which we need to care.

—CARL JUNG

Swiss psychiatrist, 20th century

Each of us develops partly like all other individuals, partly like some other individuals, and partly like no other individual. Most of the time our attention is directed to each individual's uniqueness. But as humans, we have all traveled some common paths. Each of us—Leonardo da Vinci, Joan of Arc, George Washington, Martin Luther King, Jr., and you—walked at about 1 year, engaged in fantasy play as a young child, and became more independent as a youth. Each of us, if we live long enough, will experience hearing problems and the death of family members and friends. This is the general course of our **development**, the pattern of movement or change that begins at conception and continues through the human life span.

In this section, we will explore what is meant by the concept of development and why the study of life-span development is important. We will outline the main characteristics of the life-span perspective and discuss various sources of contextual influences. In addition, we will examine some contemporary concerns in life-span development.

THE IMPORTANCE OF STUDYING LIFE-SPAN DEVELOPMENT

How might people benefit from examining life-span development? Perhaps you are, or will be, a parent or teacher. If so, responsibility for children is, or will be, a part of your everyday life. The more you learn about them, the better you can deal with them. Perhaps you hope to gain some insight about your own history—as an infant, a child, an adolescent, or a young adult. Perhaps you want to know more about what your life will be like as you grow through the adult years—as a middle-aged adult, or as an adult in old age, for example. Or perhaps you just stumbled onto this course, thinking that it sounded intriguing and that the study of the human life span might raise some provocative issues. Whatever your reasons for taking this course, you will discover that the study of life-span development is intriguing and filled with information about who we are, how we came to be this way, and where our future will take us.

Most development involves growth, but it also includes decline (as in dying). In exploring development, we will examine the life span from the point of conception until the time when life (or at least life as we know it) ends. You will see yourself as an infant, as a child, and as an adolescent, and be stimulated to think about how those years influenced the kind of individual you are today. And you will see yourself as a young adult, as a middle-aged adult, and as an adult in old age, and be motivated to think about how your experiences today will influence your development through the remainder of your adult years.

development The pattern of change that begins at conception and continues through the life span. Most development involves growth, although it also includes decline brought on by aging and dying.

life-span perspective The perspective that development is lifelong, multidimensional, multidirectional, plastic, multidisciplinary, and contextual; involves growth, maintenance, and regulation; and is constructed through biological, sociocultural, and individual factors working together.

CHARACTERISTICS OF THE LIFE-SPAN PERSPECTIVE

Although growth and development are dramatic during the first two decades of life, development is not something that happens only to children and adolescents (Kennedy & Raz, 2015). The traditional approach to the study of development emphasizes extensive change from birth to adolescence (especially during infancy), little or no change in adulthood, and decline in old age. But a great deal of change does occur in the five or six decades after adolescence. The life-span approach emphasizes developmental change throughout adulthood as well as childhood (Schaie & Willis, 2016).

Life Expectancy Recent increases in human life expectancy have contributed to the popularity of the life-span approach to development. The upper boundary of the human life span (based on the oldest age documented) is 122 years, as indicated in Figure 1; this maximum life span of humans has not changed since the beginning of recorded history. What has changed is life expectancy—the average number of years that a person born in a particular year can expect to live. In the twentieth century alone, life expectancy in the United States increased by 32 years, thanks to improvements in sanitation, nutrition, and medicine (see Figure 2). In the middle of the second decade of the twenty-first century, the life expectancy in the United States is 79 years of age (U.S. Census Bureau, 2015). Today, for most individuals in developed countries, childhood and adolescence represent only about one-fourth of their lives.

For the first time in U.S. history, there are more people over 60 years of age than under 15 years of age. In less than a century, more years were added to human life expectancy than in all of the prior millennia.

Laura Carstensen (2015) recently described the challenges and opportunities involved in this dramatic increase in life expectancy. In her view, the remarkable increase in the number of people living to an old age has happened in such a short time that science, technology, and social expectations have not kept pace. She proposes that the challenge is to change from a world constructed mainly for young people to a world that is more compatible and supportive for the increasing number of people living to age 100 and beyond.

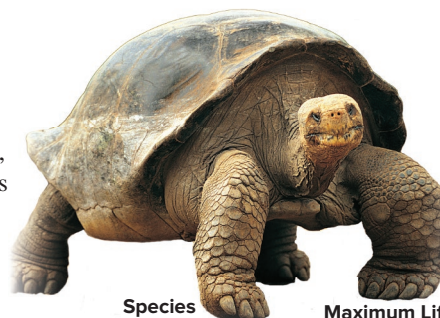
In further commentary, Carstensen (2015, p. 70) remarked that making this transformation would be no small feat:

... parks, transportation systems, staircases, and even hospitals presume that the users have both strength and stamina; suburbs across the country are built for two parents and their young children, not single people, multiple generations or elderly people who are not able to drive. Our education system serves the needs of young children and young adults and offers little more than recreation for experienced people.

Indeed, the very conception of work as a full-time endeavor ending in the early 60s is ill suited for long lives. Arguably the most troubling is that we fret about ways the older people lack the qualities of younger people rather than exploit a growing new resource right before our eyes: citizens who have deep expertise, emotional balance, and the motivation to make a difference.

Certainly some progress has been made recently in improving the lives of older adults. In our discussion of late adulthood, you will read about progress in understanding topics related to aging such as modifying the activity of genes related to aging, improving brain function in the elderly, and slowing or even reversing the effects of various chronic diseases. You'll also learn about ways to help people plan for a better life when they get old, become more cognitively sharp as they age, improve their physical fitness, and feel more satisfied with their lives as older adults. But much more remains to be accomplished, as described earlier by Laura Carstensen (Antonucci & others, 2016).

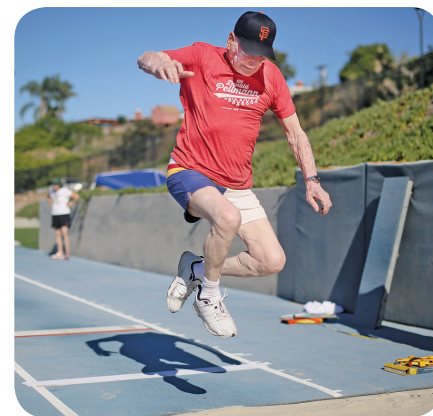
The Life-Span Perspective The belief that development occurs throughout life is central to the life-span perspective on human development, but this perspective has other characteristics as well. According to life-span development expert Paul Baltes (1939–2006), the **life-span perspective** views development as lifelong, multidimensional, multidirectional, plastic, multidisciplinary, and contextual, and as a process that involves growth, maintenance, and regulation of loss (Baltes, 1987, 2003; Baltes, Lindenberger, & Staudinger, 2006). In Baltes'



| Species (common name) | Maximum Life Span (years) |
|-----------------------|---------------------------|
| Human | 122 |
| Galápagos turtle | 100+ |
| Indian elephant | 70 |
| Chinese alligator | 52 |
| Golden eagle | 46 |
| Gorilla | 39 |
| Common toad | 36 |
| Domestic cat | 27 |
| Domestic dog | 20 |
| Vampire bat | 13 |
| House mouse | 3 |



FIGURE 1
MAXIMUM RECORDED LIFE SPAN FOR DIFFERENT SPECIES. Our only competitor for the maximum recorded life span is the Galápagos turtle.
(Tortoise image on top) © Digital Vision/PunchStock RF; (mouse image at bottom) © Redmond Durrell/Alamy RF



One-hundred-year-old Don Pellman from Santa Clara, California, keeps breaking world records in track for older adults, beating many contestants who are 20 to 30 years younger than he is.
© Sandy Huffaker/The New York Times/Redux

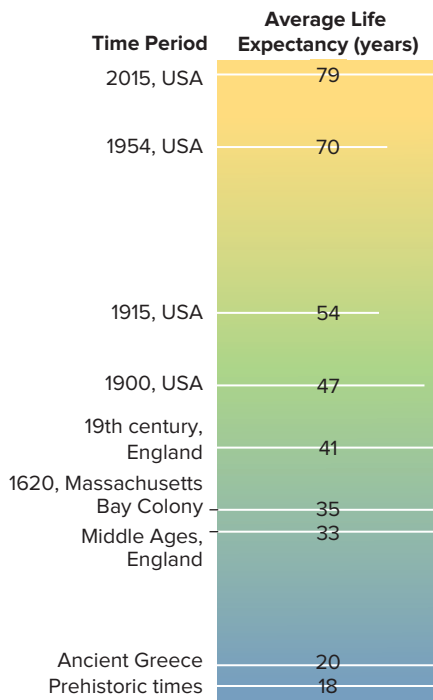


FIGURE 2
HUMAN LIFE EXPECTANCY AT BIRTH FROM PREHISTORIC TO CONTEMPORARY TIMES. It took 5,000 years to extend human life expectancy from 18 to 41 years of age.



Paul Baltes, a leading architect of the life-span perspective on development, converses with one of the long-time research participants in the Berlin Aging Study that he directs. She joined the study in the early 1990s and has participated six times in extensive physical, medical, psychological, and social assessments. In her professional life, she was a practicing medical doctor.
 Margaret M. and Paul B. Baltes Foundation

normative age-graded influences Influences that are similar for individuals in a particular age group.

normative history-graded influences Influences that are common to people of a particular generation because of historical circumstances.

nonnormative life events Unusual occurrences that have a major impact on an individual's life.

view, it is important to understand that development is constructed through biological, socio-cultural, and individual factors working together. Let's explore each of these components of the life-span perspective.

Development Is Lifelong In the life-span perspective, early adulthood is not the end-point of development; rather, no age period dominates development. Researchers increasingly study the experiences and psychological orientations of adults at different points in their lives. Later in this chapter, we will describe the age periods of development and their characteristics.

Development Is Multidimensional No matter what your age might be, your body, mind, emotions, and relationships are changing and affecting each other. Consider the development of Ted Kaczynski, the Unabomber discussed at the beginning of this chapter. When he was 6 months old, he was hospitalized with a severe allergic reaction and his parents were rarely allowed to visit him. According to his mother, the previously happy baby was never the same after his hospitalization. He became withdrawn and unresponsive. As Ted grew up, he had periodic "shutdowns" accompanied by rage. In his mother's view, a biological event during infancy warped the development of her son's mind and emotions.

Development has biological, cognitive, and socioemotional dimensions. Even within a dimension, there are many components (Lustig & Lin, 2016; Reuter-Lorenz, Festini, & Jantz, 2016). For example, attention, memory, abstract thinking, speed of processing information, and social intelligence are just a few of the components of the cognitive dimension.

Development Is Multidirectional Throughout life, some dimensions or components of a dimension expand and others shrink. For example, when one language (such as English) is acquired early in development, the capacity for acquiring second and third languages (such as Spanish and Chinese) decreases later in development, especially after early childhood (Levelt, 1989). During adolescence, as individuals establish romantic relationships, their time spent with friends may decrease. During late adulthood, older adults might become wiser because they have more experience than younger adults to draw upon to guide their decision making (Lim & Yu, 2015), but they perform more poorly on tasks that require speed in processing information (Aichele, Rabbitt, & Ghisletta, 2015; Salthouse, 2014).

Development Is Plastic Even at 10 years old, Ted Kaczynski was extraordinarily shy. Was he destined to remain forever uncomfortable with people? Developmentalists debate how much plasticity people have in various dimensions at different points in their development (Kuhn & Lindenberger, 2016). Plasticity means the capacity for change. For example, can you still improve your intellectual skills when you are in your seventies or eighties? Or might these intellectual skills be fixed by the time you are in your thirties so that further improvement is impossible? Researchers have found that the cognitive skills of older adults can be improved through training and acquisition of better strategies (Willis & Belleville, 2016). However, possibly we possess less capacity for change as we grow older (Salthouse, 2014). Understanding plasticity and its constraints is a key element on the contemporary agenda for developmental research (Kobayashi & others, 2016; Luchetti & others, 2016).

Developmental Science Is Multidisciplinary Psychologists, sociologists, anthropologists, neuroscientists, and medical researchers all share an interest in unlocking the mysteries of development through the life span. How do your heredity and health limit your intelligence? Do intelligence and social relationships change with age in the same ways around the world?

How do families and schools influence intellectual development? These are examples of research questions that cut across disciplines.

Development Is Contextual All development occurs within a context, or setting. Contexts include families, schools, peer groups, churches, cities, neighborhoods, university laboratories, countries, and so on. Each of these settings is influenced by historical, economic, social, and cultural factors (Cushner, McClelland, & Safford, 2015; Kerig, 2016).

Contexts, like individuals, change (Gauvain & Perez, 2015). Thus, individuals are changing beings in a changing world. As a result of these changes, contexts exert three types of influences (Baltes, 2003): (1) normative age-graded influences, (2) normative history-graded influences,

and (3) nonnormative or highly individualized life events. Each type of influence can have a biological or environmental impact on development.

Normative age-graded influences are similar for individuals in a particular age group. These influences include biological processes such as puberty and menopause. They also include sociocultural factors and environmental processes such as beginning formal education (usually at about age 6 in most cultures) and retiring from the workforce (which takes place during the fifties and sixties in most cultures).

Normative history-graded influences are common to people of a particular generation because of historical circumstances (Carstensen & others, 2015; George & Ferraro, 2016; Karlsson & others, 2015; MacDonald & Stawski, 2015, 2016). For example, during their youth American baby boomers shared the experience of the Cuban missile crisis, the assassination of John F. Kennedy, and the Beatles invasion. Other examples of normative history-graded influences include economic, political, and social upheavals such as the Great Depression in the 1930s, World War II in the 1940s, the civil rights and women's rights movements of the 1960s and 1970s, the terrorist attacks of 9/11/2001, as well as the integration of computers and cell phones into everyday life during the 1990s (Schaie, 2013, 2016). Long-term changes in the genetic and cultural makeup of a population (due to immigration or changes in fertility rates) are also part of normative historical change.

Nonnormative life events are unusual occurrences that have a major impact on the lives of individual people. These events do not happen to everyone, and when they do occur they can influence people in different ways. Examples include the death of a parent when a child is young, pregnancy in early adolescence, a fire that destroys a home, winning the lottery, or getting an unexpected career opportunity.

Development Involves Growth, Maintenance, and Regulation of Loss Baltes and his colleagues (2006) assert that the mastery of life often involves conflicts and competition among three goals of human development: growth, maintenance, and regulation of loss. As individuals age into middle and late adulthood, the maintenance and regulation of loss in their capacities takes center stage. Thus, a 75-year-old man might aim not to improve his memory or his golf swing but to maintain his independence and his ability to play golf at all. In the chapters on “Physical and Cognitive Development in Middle Adulthood” and “Socioemotional Development in Middle Adulthood” we will discuss these ideas about maintenance and regulation of loss in greater depth.

Development Is a Co-construction of Biology, Culture, and the Individual Development is a co-construction of biological, cultural, and individual factors working together (Baltes, Reuter-Lorenz, & Rösler, 2012). For example, the brain shapes culture, but it is also shaped by culture and the experiences that individuals have or pursue. In terms of individual factors, we can go beyond what our genetic inheritance and our environment give us. We can author a unique developmental path by actively choosing from the environment the things that optimize our lives (Rathunde & Csikszentmihalyi, 2006).

SOME CONTEMPORARY CONCERNS

Pick up a newspaper or magazine and you might see headlines like these: “Political Leanings May Be Written in the Genes,” “Mother Accused of Tossing Children into Bay,” “Gender Gap Widens,” “FDA Warns About ADHD Drug,” “Heart Attack Deaths Higher in African American Patients,” “Test May Predict Alzheimer’s Disease.” Researchers using the life-span perspective are examining these and many other topics of contemporary concern. The roles that health and well-being, parenting, education, and sociocultural contexts play in life-span development, as well as how social policy is related to these issues, are a particular focus of this textbook.

Health and Well-Being Health professionals today recognize the powerful influences of lifestyles and psychological states on health and well-being (Donatelle, 2015; Insel & Roth, 2016). In every chapter of this book, issues of health and well-being are integrated into our discussion.

Clinical psychologists are among the health professionals who help people improve their well-being. Read about one clinical psychologist who helps adolescents who have become juvenile delinquents or substance abusers in *Connecting with Careers*.

Parenting and Education Can two gay men raise a healthy family? Are children harmed if both parents work outside the home? Are U.S. schools failing to teach children how



What characterizes the life-span perspective on development?

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Nonnormative life events, such as Hurricane Sandy, in 2012, are unusual circumstances that have a major impact on a person's life.

© Adam Hunger/Reuters/Landov

developmental connection

Middle Age

Adults typically face more losses in middle age than earlier in life. Connect to “Physical and Cognitive Development in Middle Adulthood.”

developmental connection

Exercise

What effect might exercise have on children's and older adults' ability to process information? Connect to “Physical and Cognitive Development in Middle and Late Childhood” and “Physical Development in Late Adulthood.”

Luis Vargas, Clinical Child Psychologist

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Vargas obtained an undergraduate degree in psychology from St. Edward's University in Texas, a master's degree in psychology from Trinity University in Texas, and a Ph.D. in clinical psychology from the University of Nebraska–Lincoln.

Vargas' main interests are cultural issues and the assessment and treatment of children, adolescents, and families. He is motivated to find better ways to provide culturally responsive mental health services. One of his special interests is the treatment of Latino youth for delinquency and substance abuse.



Luis Vargas (left) conducts a child therapy session.
Courtesy of Luis Vargas

For more information about what clinical psychologists do, see the Careers in Life-Span Development appendix.

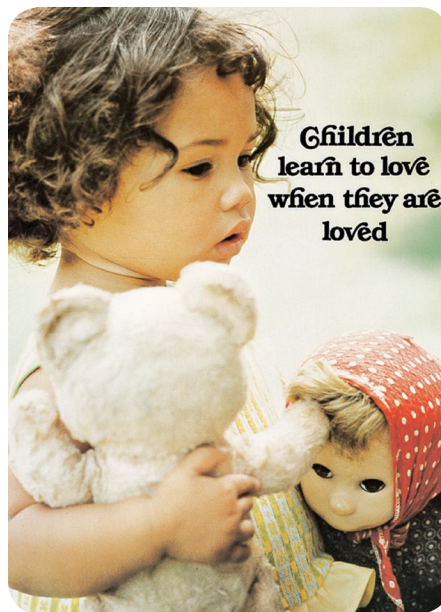
culture The behavior patterns, beliefs, and all other products of a group that are passed on from generation to generation.

cross-cultural studies Comparison of one culture with one or more other cultures. These provide information about the degree to which development is similar, or universal, across cultures, and the degree to which it is culture-specific.

ethnicity A characteristic based on cultural heritage, nationality characteristics, race, religion, and language.

socioeconomic status (SES) Refers to the grouping of people with similar occupational, educational, and economic characteristics.

gender The characteristics of people as males or females.



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to read and write and calculate adequately? We hear many questions like these involving pressures on the contemporary family and the problems of U.S. schools (Cicchetti & Toth, 2015, 2016). In later chapters, we will analyze child care, the effects of divorce, parenting styles, child maltreatment, intergenerational relationships, early childhood education, links between childhood poverty and education, bilingual education, new educational efforts to improve lifelong learning, and many other issues related to parenting and education (Feehey, Moravcik, & Nolte, 2016; Pianta, 2016).

Sociocultural Contexts and Diversity

Health, parenting, and education—like development itself—are all shaped by their sociocultural context. To analyze this context, four concepts are especially useful: culture, ethnicity, socioeconomic status, and gender.

Culture encompasses the behavior patterns, beliefs, and all other products of a particular group of people that are passed on from generation to generation. Culture results from the interaction of people over many years (Cole & Tan, 2015; Packer & Cole, 2016). A cultural group can be as large as the United States or as small as an isolated Appalachian town. Whatever its size, the group's culture influences the behavior of its members (Hooymman, Kiyak, & Kawamoto, 2015; Masumoto & Juang, 2017).

Cross-cultural studies compare aspects of two or more cultures. The comparison provides information about the degree to which development is similar (or universal) across cultures, or is instead culture-specific (Chen & Liu, 2016; Putnick & others, 2015).

Ethnicity (the word *ethnic* comes from the Greek word for “nation”) is rooted in cultural heritage, nationality, race, religion, and language. African Americans, Latinos, Asian Americans,



Two Korean-born children on the day they became United States citizens. Asian American and Latino children are the fastest-growing immigrant groups in the United States. *How diverse are the students in your life-span development class? How are their experiences in growing up likely to have been similar to or different from yours?*

© Nancy Agostini



their daughters' future. Doly says that the girls in her UNICEF group are far more aware of their rights than their mothers ever were. (UNICEF, 2007).

Naser Siddique/UNICEF Bangladesh

Doly Akter, age 17, lives in a slum in Dhaka, Bangladesh, where sewers overflow, garbage rots in the streets, and children are undernourished. Nearly two-thirds of young women in Bangladesh marry before they are 18. Doly organized a club supported by UNICEF in which girls go door-to-door to monitor the hygiene habits of households in their neighborhood. The monitoring has led to improved hygiene and health in the families. Also, her group has managed to stop several child marriages by meeting with parents and convincing them that it is not in their daughter's best interests. When talking with parents in their neighborhoods, the girls in the club emphasize the importance of staying in school and how this will improve

Native Americans, European Americans, and Arab Americans are a few examples of broad ethnic groups in the United States. Diversity exists within each ethnic group (Banks, 2015; Gonzales & others, 2016). A special concern is the discrimination and prejudice experienced by ethnic minority children (Cheng, Goodman, & the Committee on Pediatric Research, 2015; Spencer & Swanson, 2016).

Socioeconomic status (SES) refers to a person's position within society based on occupational, educational, and economic characteristics. Socioeconomic status implies certain inequalities (George & Ferraro, 2016). Differences in the ability to control resources and to participate in society's rewards produce unequal opportunities (Marks & others, 2015; Wadsworth & others, 2016).

Gender refers to the characteristics of people as males and females. Few aspects of our development are more central to our identity and social relationships than gender (Bigler, 2015; Leaper, 2015).

In the United States, the sociocultural context has become increasingly diverse in recent years. The U.S. population includes a greater variety of cultures and ethnic groups than ever before. This changing demographic tapestry promises not only the richness that diversity produces but also difficult challenges in extending the American dream to all individuals (Banks, 2015). We will discuss sociocultural contexts and diversity in each chapter.

A special cross-cultural concern is the educational and psychological conditions of women around the world (UNICEF, 2016). Inadequate educational opportunities, violence, and mental health issues are among the problems faced by many women.

Considerable progress has been made in many parts of the world in girls' school attendance (UNICEF, 2015). However, in some regions, girls continue to receive less education. For example, in secondary



Marian Wright Edelman, president of the Children's Defense Fund (shown here advocating for health care), has been a tireless advocate of children's rights and has been instrumental in calling attention to the needs of children. *What are some of these needs?*

Courtesy of the Children's Defense Fund and Marian Wright Edelman