Eighteenth Edition

Life-Span Development

John W. Santrock

LIFE-SPAN DEVELOPMENT

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JOHN W. SANTROCK
University of Texas at Dallas

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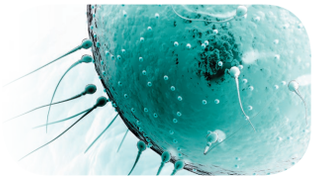

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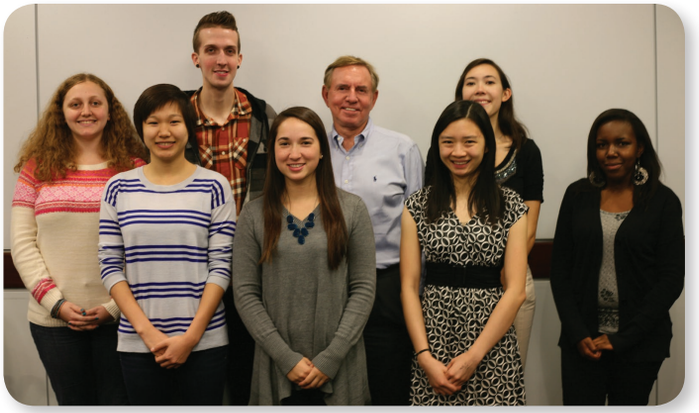
about the **author**

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 received the University's Effective Teaching Award. In 2010, he created the UT-Dallas Santrock undergraduate travel scholarship, an annual award that is given to outstanding undergraduate students majoring in developmental psychology to enable them to attend research conventions. In 2019, he created an endowment that will provide the travel awards for students at UT-Dallas for decades to come. Additionally, Dr. Santrock and his wife, Mary Jo, created a permanent endowment that will provide academic scholarships for six to ten undergraduate psychology students per year, with preference given to those majoring in developmental psychology.

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* (14th edition), *Adolescence* (17th edition), *A Topical Approach to Life-Span Development* (10th edition), and *Educational Psychology* (6th 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. John has been married for four decades to his wife, Mary Jo, who created and directed the first middle school program for children with learning disabilities and behavioral disorders in the Clarke County Schools in Athens, Georgia. More recently, Mary Jo has worked as 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. Both have followed in their mother's footsteps and are now Realtors. Jennifer was inducted into the SMU sports hall of fame, only the fifth female to ever have been given this award. He has one granddaughter, Jordan, age 27, who works for the accounting firm Ernst & Young, and two grandsons, Alex, age 15, and Luke, age 13. In the last two decades, John also has spent time painting divisionist and expressionist art.



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

Jessica Serna

Dedication:

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

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*
K. Warner Schaie, *Pennsylvania State University*
Paul Baltes, *Max Planck Institute, Berlin*
Tiffany Field, *University of Miami*
James Birren, *University of Southern California*
Jean Berko Gleason, *Boston University*
Gilbert Gottlieb, *University of North Carolina–Chapel Hill*
Karen Adolph, *New York University*
Joseph Campos, *University of California–Berkeley*
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David Almeida, *Pennsylvania State University*
John Schulenberg, *University of Michigan*
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Ravenna Helson, *University of California–Berkeley*
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Toni Antonucci, *University of Michigan*
Scott Johnson, *University of California–Los Angeles*
Patricia Miller, *San Francisco State University*
Amanda Rose, *University of Missouri–Columbia*
Arthur Kramer, *University of Illinois*
Karen Fingerman, *Purdue University*
Cigdem Kagitcibasi, *Koc University*
Robert Kastenbaum, *Arizona State University*

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


Photo courtesy of Charles A. Nelson

Charles Nelson Dr. Nelson is one of the world's leading neuroscientists in the field of child development. He is currently Professor of Pediatrics and Neuroscience and Professor of Psychology in the Department of Psychiatry at Harvard Medical School, and Professor of Education in the Harvard Graduate School of Education. Dr. Nelson also holds the Richard David Scott Chair in Pediatric Developmental Medicine Research at Boston Children's Hospital and serves as Director of Research in the Division of Developmental Medicine. His research interests center on a variety of problems in developmental cognitive neuroscience, including the development of social perception; developmental trajectories to autism; and the effects of early adversity on brain and behavioral development. Dr. Nelson chaired the John D. and Catherine T. MacArthur Foundation Research Network on Early Experience and Brain Development and served on the National Academy of Sciences (NAS) panels that wrote *From Neurons to Neighborhoods*, and more recently, *New Directions in Child Abuse and Neglect Research*. Among his many honors, he has received the Leon Eisenberg award from Harvard Medical School and an honorary Doctorate from Bucharest University (Romania), was a resident fellow at the Rockefeller Foundation Bellagio Center (Italy), has been elected to the American Academy of Arts and Sciences and the National Academy of Medicine, and has received the Ruane Prize for Child and Adolescent Psychiatric Research from the Brain & Behavior Research Foundation.

". . . I loved the book. It continues to be written in an engaging way. John's mastery of the literature is extraordinary and, honestly, there is very little that is missing from the book. In a word, if I still taught an introductory course in developmental psychology, I'm sure I would adopt this book." **–Charles Nelson, *Harvard University***


Photo courtesy of Laura L. Carstensen

Laura Carstensen Dr. Carstensen is one of the world's leading experts on socioemotional development and aging. She currently is Professor of Psychology and the Fairleigh S. Dickinson Jr. Professor in Public Policy at Stanford University where she serves as founding director of the Stanford Center on Longevity. Dr. Carstensen's research has been supported continuously by the National Institute on Aging for more than 25 years and she is currently supported through a prestigious MERIT Award. In 2011, she authored the book, *A Long Bright Future: Happiness, Health, and Financial Security in an Age of Increased Longevity*. Dr. Carstensen has served on the National Advisory Council on Aging and the

MacArthur Foundation's Research Network on an Aging Society. In 2016, she was inducted into the National Academy of Medicine. Dr. Carstensen has won numerous awards, including the Kleemeier Award from the Gerontological Society of America, a Guggenheim fellowship, and the Master Mentor Award from the American Psychological Association. She also received a BS from the University of Rochester and Ph.D. in clinical psychology from West Virginia University.

"It's a great textbook." **–Laura Carstensen, *Stanford University***

Photo courtesy of Lauren H. Adams

James Graham Dr. Graham is a leading expert on the community aspects of ethnicity, culture, and development. He obtained his undergraduate degree from Miami University and received masters and doctoral degrees in developmental psychology from the University of Memphis. Dr. Graham's current position is Professor of Psychology, The College of New Jersey (TCNJ). His research addresses the social-cognitive aspects of relationships between group and dyadic levels across developmental periods in community-based settings. Three interdependent dimensions of his research program examine (1) populations that are typically understudied, conceptually limited, and methodologically constrained; (2) development of empathy and prosocial behavior with peer groups and friends; and (3) developmental science in the context of community-engaged research partnerships. Currently, he is Coordinator of the Developmental Specialization in Psychology at TCNJ. For a decade, Dr. Graham taught graduate courses in psychology and education in Johannesburg, South Africa, through TCNJ's Graduate Summer Global Program. He also is the co-author of *The African American Child: Development and Challenges* (2nd ed.) and *Children of Incarcerated Parents: Theoretical, Developmental, and Clinical Issues.* Dr. Graham has presented his work at a variety of international and national conferences and has published articles in a wide range of journals, including *Social Development*, *Child Study Journal*, *Behavior Modification*, *Journal of Multicultural Counseling and Development*, and *American Journal of Evaluation*.

"John Santrock seamlessly integrates the latest research on the physical, cognitive, and social processes of children in an ever-evolving multicultural society. . . . I am impressed with his sensitivity to the impact of culture, ethnicity, and socioeconomic status on child and adolescent development. . .The text will help students learn to analyze, compare, and contrast alternative perspectives on children domestically and globally. . . . The text also will help students to understand the latest research regarding societal values about ethnicity, socioeconomic, and gender issues in child development, and how they influence individual growth as well as shape public policy." **–James Graham, *The College of New Jersey***

Photo courtesy of Virginia Tech

Martha Ann Bell Dr. Bell is one of the world's leading experts on infants' and young children's cognitive development and socioemotional development. She obtained her Ph.D. from the University of Maryland and currently is Professor and College of Science Faculty Fellow at Virginia Tech University. Her research focuses on cognitive, emotional, and psychophysical processes associated with frontal lobe development in infants and children, with an emphasis on executive function, emotion regulation, and temperament. Her research is funded by the National Institutes of Health and published in leading developmental psychology journals such as *Child Development* and *Developmental Science.* Dr. Bell is an elected member of the Executive Board of the American Psychological Association (developmental division). She has been the Chief Editor of the journal *Infancy*, became an elected member of Executive Board of the International Society for Developmental Psychobiology, and was the recent chair of the *Cognition and Emotion* grant review panel at NIH. Dr. Bell is a fellow of the American Psychological Association (developmental and experimental/cognitive divisions) and of the Association for Psychological Science, as well as a recent recipient of the Senior Investigator Award from the International Society for Developmental Psychobiology.

"I have been a huge fan of this life-span text for many years. It is simply the best in the field because of its consistent high quality (especially its focus on the most important and timely research) from one edition to the next. It is a 'beautiful' textbook, meaning it is appealing and easy to read. The way it is organized makes you want to read it. And the little nudges throughout to go back and think about previous chapters is excellent." **–Martha Ann Bell, *Virginia Tech University***

Photo courtesy of Robert Lickliter

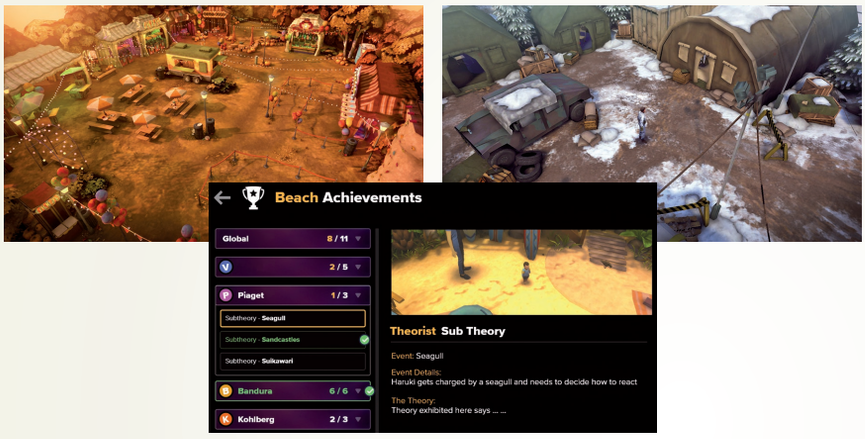
David Moore Dr. Moore is a leading expert on infant perceptual and cognitive development, and on genetic and environmental influences on development. He obtained a Ph.D. in developmental and biological psychology from Harvard University. After completing a postdoctoral fellowship at the City University of New York, he joined the faculties of Pitzer College and Claremont Graduate University, where he currently is a professor of psychology. Dr. Moore's empirical research has produced numerous publications on the development of mental rotation in infancy, on the electrophysiological measurement of covert attention in infants, and on the emergence of infants' nascent "mathematical" competence. His theoretical writings have explored the contributions of genetic, environmental, and epigenetic factors to human development. His 2002 book, *The Dependent Gene*, was widely adopted for use in undergraduate education and was translated into Japanese. His 2015 book, *The Developing Genome: An Introduction to Behavioral Epigenetics*, won both the William James Book Award and the Eleanor Maccoby Book Award from the American Psychological Association (APA). Dr. Moore has served on the consulting editorial board of *Child Development Perspectives* and is currently a Member-at-Large of the Executive Committee of the APA's Developmental Psychology Division. From 2016 to 2018, he also served as the Director of the U.S. National Science Foundation's Developmental Sciences Program in Washington, D.C.

"I think this chapter (Biological Beginnings) will make an important contribution to the textbook. I think this book's primary strength is the clear, direct, and engaging way in which it has been written. I especially appreciate John Santrock's efforts to keep the book very up-to-date, both in terms of research-connected content and its supplementary materials. I also like the decision to find ways to encourage students to think about 'their own personal journey through life.'" **–David Moore, *Pitzer College and Claremont University***

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's **Connect** is a digital assignment and assessment platform that strengthens the link between faculty, students, and coursework, 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.

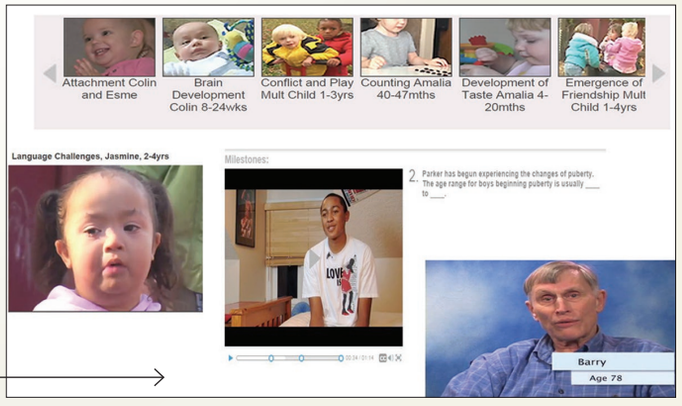


Apply Concepts and Theory in an Experiential Learning Environment

An engaging and innovative learning game, **Quest: Journey Through the Lifespan** provides students with opportunities to apply content from their human development curriculum to real-life scenarios. Students play unique characters who range in age and make decisions that apply key concepts and theories for each age as they negotiate events in an array of authentic environments. Additionally, as students analyze real-world behaviors and contexts, they are exposed to different cultures and intersecting biological, cognitive, and socioemotional processes. Each quest has layered replayability, allowing students to make new choices each time they play—or offering different students in the same class different experiences. Fresh possibilities and outcomes shine light on the complexity of and variations in real human development. This new experiential learning game includes follow-up questions, assignable in Connect and auto-graded, to reach a higher level of critical thinking.

Real People, Real World, Real Life

At the higher end of Bloom's taxonomy (analyze, evaluate, create), 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 life span. New to this edition, Milestones are available in a more engaging, WCAG-compliant format. Ask your McGraw-Hill representative about this new upgrade!

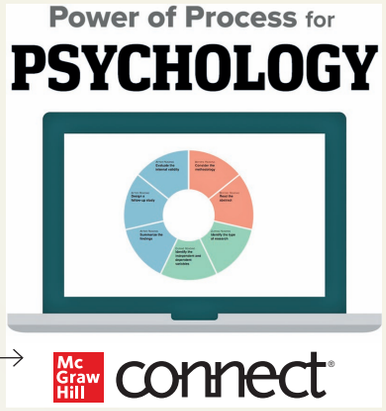


Develop Effective Responses

McGraw-Hill's new **Writing Assignment Plus** tool delivers a learning experience that improves students' written communication skills and conceptual understanding with every assignment. Assign, monitor, and provide feedback on writing more efficiently and grade assignments within McGraw-Hill Connect. Writing Assignment Plus gives you time-saving tools with a just-in-time basic writing and originality checker.

Prepare Students for Higher-Level Thinking

Also at the higher end of Bloom's taxonomy, **Power of Process** for Psychology helps students improve critical thinking skills and allows instructors to assess these skills efficiently and effectively in an online environment. Available through Connect, pre-loaded journal articles are available for instructors to assign. Using a scaffolded framework such as understanding, synthesizing, and analyzing, Power of Process moves students toward higher-level thinking and analysis.



Better Data, Smarter Revision, Improved Results

Mc Graw Hill | SMARTBOOK®

McGraw-Hill Education's **SmartBook** helps students distinguish the concepts they know from the concepts they don't, while pinpointing the concepts they are about to forget. 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.

SmartBook is optimized for mobile and tablet use and is accessible for students with disabilities. Content-wise, measurable and observable learning objectives help improve student outcomes. SmartBook personalizes learning to individual student needs, continually adapting to pinpoint knowledge gaps and focus learning on topics that need the most attention. Study time is more productive and, as a result, students are better prepared for class and coursework. For instructors, SmartBook tracks student progress and provides insights that can help guide teaching strategies.

Online Instructor Resources

The resources listed here accompany *Life-Span Development,* Eighteenth Edition. Please contact your McGraw-Hill 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, this resource provides chapter outlines, suggested lecture topics, classroom activities and demonstrations, suggested student research projects, essay questions, and critical thinking questions.

Test Bank and Test Builder This comprehensive Test Bank includes more than 1,500 multiple-choice, short answer, and essay questions. Organized by chapter, the questions are designed to test factual, applied, and conceptual knowledge. New to this edition and available within Connect, Test Builder is a cloud-based tool that enables instructors to format tests that can be printed and administered within a Learning Management System. Test Builder offers a modern, streamlined interface for easy content configuration that matches course needs without requiring a download. Test Builder enables instructors to:

- Access all test bank content from a particular title
- Easily pinpoint the most relevant content through robust filtering options
- Manipulate the order of questions or scramble questions and/or answers
- Pin questions to a specific location within a test
- Determine your preferred treatment of algorithmic questions
- Choose the layout and spacing
- Add instructions and configure default settings

PowerPoint Slides The PowerPoint presentations, now WCAG compliant, highlight the key points of the chapter and include supporting visuals. All of the slides can be modified to meet individual needs.

Remote Proctoring New remote proctoring and browser-locking capabilities are seamlessly integrated within Connect to offer more control over the integrity of online assessments. Instructors can enable security options that restrict browser activity, monitor student behavior, and verify the identity of each student. Instant and detailed reporting gives instructors an at-a-glance view of potential concerns, thereby avoiding personal bias and supporting evidence-based claims.

Mc Graw Hill connect + proctorio

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:*

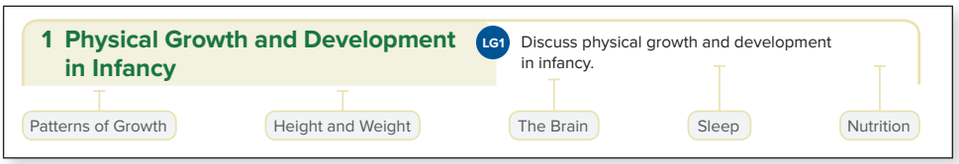
1. **Connecting with today's students** To help students learn about life-span development more effectively.
2. **Connecting research to what we know about development** To provide students with the best and most recent theory and research in the world today about each of the periods of the human life 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.

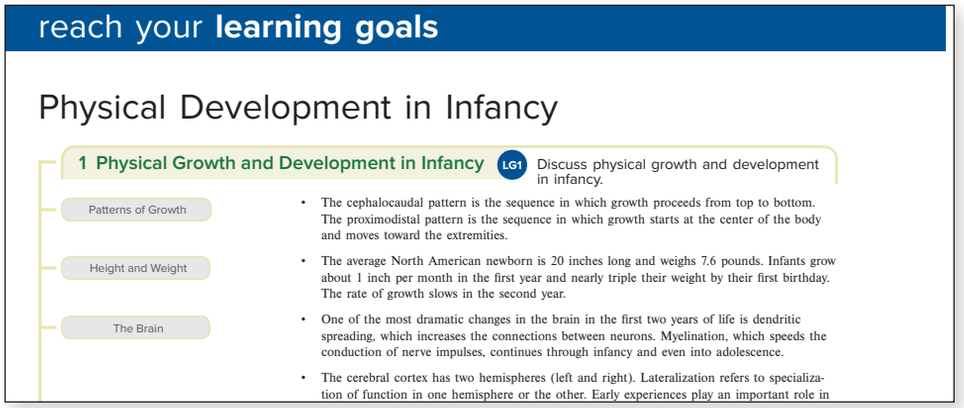
Connecting with Today's Students

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 xviii), 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 chapter opening outline, learning goals for the chapter, mini-chapter maps that open each main section of the chapter, *Review,*





reach your **learning goals**

Physical Development in Infancy

1 Physical Growth and Development in Infancy LG1 Discuss physical growth and development in infancy.

Patterns of Growth

- 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.

Height and Weight

- 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.

The Brain

- 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

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 percent were enrolled in child-care centers.

Socioeconomic factors were linked to the amount and type of care. For example, mothers with higher incomes and families that were more dependent on the mother's income placed their infants in child care at an earlier age. Mothers who believed that maternal employment has positive effects on children were more likely than other mothers to place their infant in nonmaternal care for more hours. Low-income families were more likely than more affluent families to use child care, but infants from low-income families who

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

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 research 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 insecure attachment to the mother among infants who were 15 months of age, but only when the mother was low in sensitivity and responsiveness. However, child-care quality was not linked to attachment security at 36 months of age. In one study, higher-quality child care

Connecting Research to What We Know about Development

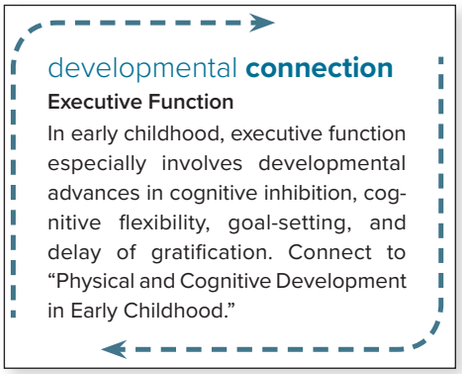
Over the years, it has been important for me to include the most up-to-date research available. I continue that tradition in this edition by looking closely at specific areas of research, involving experts in related fields, and updating research throughout. ***Connecting Through Research*** describes 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 *How Can Newborns' Perception Be Studied?* to *Parenting and Children's Achievement: My Child Is My Report Card, Tiger Mothers,* and *Tiger Babies Strike Back* to *What Is the Relationship Between Fitness in Young Adults and Cardiovascular Health in Middle Age?* to *Does Engaging in Intellectually Challenging Activities Affect Quality of Life and Longevity?*

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 xvi, and the chapter-by-chapter highlights of new research content are listed on pages xxiii to xlvi. 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 1,500 citations from 2018 to 2021.

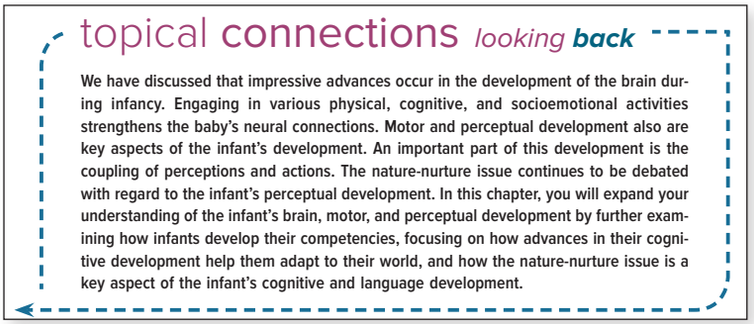
Connecting Developmental Processes

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 in "Prenatal Development and Birth" and the aging brain is described in "Physical Development in Late Adulthood." An important brain topic that we discuss in these two chapters is neurogenesis, the production of new neurons. Connections between these topics in these two chapters are highlighted through *Developmental Connections*.



Topical Connections: Looking Back and ***Looking Forward*** begin and conclude each chapter by placing the chapter's coverage in the larger context of development. These sections remind the reader of what happened developmentally in previous periods of development and make connections to topics that will be discussed in more detail.



Finally, a *Connect* question appears in the section self-reviews—*Review, Connect, and Reflect*—so students can practice making connections between topics. For example, in "Physical and Cognitive Development in Middle and Late Childhood," students are asked to connect what they learned about attention in "Cognitive Development in Infancy" and "Cognitive Development in Early Childhood" with what they have just read about attention deficit hyperactivity disorder in the middle and late childhood chapter.

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 begins with a story designed to increase students' interest and motivation to read the chapter. For example, "Cognitive Development in Late Adulthood" begins with a description of the remarkable Helen Small, who published her first book at age 91 and completed her undergraduate degree 70 years after she started college.

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 xvii, 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

Ahou Vaziri, Teach for America Instructor

Ahou Vaziri was a top student in author John Santrock's educational psychology course at the University of Texas at Dallas, where she majored in Psychology and Child Development. The following year she served as a teaching intern for the educational psychology course, then submitted an application to join Teach for America and was accepted. Ahou was assigned to work in a low-income area of Tulsa, Oklahoma, where she taught English to seventh- and eighth-graders. In her words, "The years I spent in the classroom for Teach for America were among the most rewarding experiences I have had thus far in my career. I was able to go home every night after work knowing that I truly made a difference in the lives of my students."

Upon completion of her two-year teaching experience with Teach for America, Ahou continued working for the organization by recruiting college students to serve as Teach for America instructors. Subsequently, she moved into a role that involved developing curricula for Teach for America. Recently Ahou earned a graduate degree in counseling from Southern Methodist University, and in 2019 she entered a doctoral program in counseling at the University of North Texas.

Ahou Vaziri with her students in the Teach for America program. *What is Teach for America?*
Courtesy of Ahou Vaziri

Connecting with Careers profiles careers ranging from an educational psychologist to a toy designer to a marriage and family therapist to a research scientist at an educational center to a geriatric nurse—each of which requires knowledge about human development.

These career profiles include Gustavo Medrano, a clinical psychologist who works at the Family Institute at Northwestern University and provides therapy especially for Latino children; Dr. Faize Mustaf-Infante, a pediatrician who is passionate about preventing obesity in children; Dr. Melissa Jackson, a child and adolescent psychiatrist who provides therapy for children with a number of psychological disorders, including ADHD, anxiety, depression, and post-traumatic stress disorder; and Ahou Vaziri, a Teach for America Instructor and curriculum designer.

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.

Content Revisions

A significant reason why *Life-Span Development* has been successfully used by instructors edition after edition 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 1,500 citations from 2018, 2019, 2020, and 2021.

New research and content that have especially been updated and expanded for this edition include health and well-being; development of the brain; culture and diversity; technology; and successful aging. Following is a sample of the many chapter-by-chapter changes that were made in this new edition of *Life-Span Development*.

Chapter 1: Introduction

- Revisions based on comments by leading diversity expert James Graham
- Update on life expectancy in the United States (Arias & Xu, 2019)
- New commentary that for the first time in history in the United States, in 2019 there were more individuals over 60 than under 18
- Greatly expanded discussion of high-interest topics related to health and well-being that are covered throughout this edition (Goode, 2020; Telljohann & others, 2020)
- Updated data on the percentage of U.S. children and adolescents 17 years and younger from different ethnic groups in 2017 and projected to 2050, with dramatic increases in Latino and Asian American children (ChildStats.gov, 2018)
- Updated data on the percentage of U.S. children and adolescents under age 18 living in poverty, including data reported separately for African American and Latino families, among whom the rates have declined since 2015 (Fontenot, Semega, & Kollar, 2018)
- Inclusion of a recent focus in the Ascend two-generation program on the importance of parents' education, economic stability, and overall health for their children's well-being (Ascend, 2019)
- New projections on the significant increase in older adults in the world, with predictions of a doubling of the population of individuals 60 and over and a tripling or quadrupling of those 80 and over by 2050 (United Nations, 2017)
- New commentary about how significant projected increases in the older population around the world make it necessary for countries to develop innovative policies and expanded services involving housing, employment, health care, and transportation
- Description of a recent research study that found older adults who were more conscientious and emotionally stable were less cognitively vulnerable (Duchek & others, 2020)
- Coverage of a recent study of cohort effects in which older adults report fewer constraints today than their counterparts 18 years ago, while younger adults report more constraints now than their counterparts 18 years ago (Drewelies & others, 2018)
- Inclusion of recent research across 150 countries indicating that health was a better predictor of life satisfaction in individuals 58 years and older than in younger age groups (Joshanloo & Jovanovic, 2019)
- Updated content on Bandura's (2018) social cognitive theory, in which he now emphasizes *forethought* as a key cognitive factor in the theory
- Updated content on cohort effects involving increased interest in a new generation, labeled generation Z and/or post-millennial, that is characterized by even greater technological immersion and sophistication, greater ethnic diversity, and higher educational attainment than the millennial generation (Dimock, 2019; Fry & Parker, 2018)

Chapter 2: Biological Beginnings

- Updates and revisions based on feedback from leading experts David Moore and Charles Nelson
- Expanded criticism of evolutionary psychology mentioning the difficulty of offering direct proof of an argument to support this view
- New criticism of the modularity of the human mind concept offered by evolutionary psychologists, pointing out that the human brain has extensive connections across different domains and does not function in nearly as compartmentalized a fashion as the modularity view proposes
- Updated data on the number of genes that humans have, now raised to 21,306 (Salzberg & others, 2018)
- Inclusion of loneliness as a factor that influences gene expression
- Updated and expanded research on how diet (Dasinger & others, 2020), tobacco use (Sugden & others, 2019), sleep (Lehtinen & others, 2019), obesity (Marousez, Lesage, & Eberle, 2020), and colorectal cancer (Alvizo-Rodriquez & others, 2020) can modify the expression of genes through the process of methylation
- Inclusion of recent research indicating that methylation may be involved in depression (Payne & others, 2020), breast cancer (Parashar & others, 2018), leukemia (Bewersdorf & others, 2019), and attention deficit hyperactivity disorder (Kim & others, 2018)
- New content on Prader-Willi syndrome that links mental health problems to genetic imprinting (Feieghan & others, 2020)
- Updated and expanded coverage of susceptibility genes, including those involved in arthritis (Reynard & Barter, 2020), cancer (Liu & Tan, 2019), and cardiovascular disease (Taylor & others, 2019)
- Updated and expanded research on gene-gene interaction to include immune system functioning (Kostel Bal & others, 2020), alcoholism (Chen & others, 2017), cancer (Lee & others, 2019), obesity (Wang & others, 2019), type 2 diabetes (Dominquez-Cruz & others, 2020), arthritis (Fathollahi & others, 2019), cardiovascular disease (Wang & others, 2020), and Alzheimer disease (Li & others, 2020)

- Coverage of a recent study that found XYY boys did not have more cognitive deficits than XY boys, but they did have more externalizing and internalizing problems (Operto & others, 2019)
- New content on the number of children born worldwide with sickle-cell anemia and how stem cell transplantation is being explored in the treatment of infants with sickle-cell anemia (Azar & Wong, 2017; Tanhehco & Bhatia, 2019)
- New content involving potential reduction or elimination of genetic diversity as genetic advances in prenatal testing allow pregnancy determination decisions to occur at earlier and earlier dates when termination is easier
- New coverage of cell-free fetal DNA in maternal blood and its testing as early as 10 weeks into the first trimester of pregnancy to test for such disorders as Down syndrome (Hui, 2019)
- Coverage of a recent study using non-invasive fetal diagnosis that determined fetal sex at 4.5 weeks (D'Aversa & others, 2018)
- Discussion of recent research indicating that a high level of oxidative stress is linked to male infertility and that a combination of oral antioxidants and lifestyle changes, such as reduced smoking and drinking, as well as increased exercise, may reduce male infertility (Barati, Nikzad, & Karimian, 2020)
- Description of the recent use of methylation to determine causes of infertility (Mohanty & others, 2020)
- Inclusion of a recent study that indicated birth fathers, who were often less likely to be included in open adoption, would like to be part of the open adoption triad (adoptee, birth family, and adoptive family) (Clutter, 2020)

Chapter 3: Prenatal Development and Birth

- New commentary about neurogenesis being largely complete by about the end of the fifth month of prenatal development (Borsani & others, 2019)
- Coverage of a recent study that confirmed a significant risk for suicidal behavior in adolescents with FASD (O'Connor & others, 2019)
- Inclusion of a recent study that revealed maternal alcohol use during pregnancy was associated with offsprings' anxiety, depression, and emotional problems, even at low to moderate levels of consumption (Easey & others, 2019)
- Discussion of a recent meta-analysis of 15 studies that concluded smoking during pregnancy increases offsprings' risk for ADHD and that the risk is greater if the mother is a heavy smoker (Huang & others, 2018)
- Description of a recent study that found a number of negative cognitive and behavioral outcomes for infants in the first year of life as a consequence of maternal cigarette smoking during pregnancy: negative affect, poorer attention, greater excitability, and more irritability (Froggatt, Covey, & Reissland, 2020)
- Coverage of a recent study in which higher maternal pregnancy-related stress was linked to more emotional symptoms, peer relationship problems, and overall child difficulties at 4 years of age (Acosta & others, 2019)
- New commentary that cessation of smoking by pregnant women by the third trimester is linked to improved birth outcomes (Crume, 2019)
- New coverage of a recent study in which chronic exposure to e-cigarette aerosols was linked to low birth weight in offspring (Orzabal & others, 2019)
- Inclusion of a longitudinal study in which prenatal cocaine exposure was linked to early use of marijuana, arrest history, conduct disorder, and emotional regulation problems at 21 years of age (Richardson & others, 2019)
- Discussion of a recent study that found newborns born to mothers who had used marijuana during pregnancy were more likely to be born preterm or low birth weight (Petrangelo & others, 2019)
- Coverage of a recent study in which marijuana use during pregnancy was associated with an increased rate of chronic obstructive pulmonary disease in 4-year-old children (Villarreal & others, 2019)
- New section, "Synthetic Opioids and Opiate-Related Pain Killers," that discusses the increasing use of these substances by pregnant women and their possible harmful outcomes for pregnant women and their offspring (Clemens-Cope & others, 2019; Jantzie & others, 2020)
- Inclusion of a recent study that found that the offspring of mothers who had diabetes during pregnancy had an increased risk of developing early-onset cardiovascular disease in early adulthood (Yu & others, 2019)
- Discussion of evidence that being overweight and obese during pregnancy is linked to higher heart rate in the fetus (Mat Hustin & others, 2020)
- Discussion of a recent meta-analysis in which offspring of women who were overweight or obese had an increased risk of developing childhood diabetes and obesity (Hidayat, Zou, & Shi, 2019)
- Description of a recent study that found pregnant women 43 years and older were more likely to have infants who were stillborn (Wu & others, 2019)
- Inclusion of a recent, very large-scale study that indicated 40-year-old women had a twofold increased risk of having a stillborn baby, a risk that increased eightfold at 55 years of age (Mayo & others, 2019)
- New discussion of two recent studies that found advanced maternal age, especially 40 years and older, was linked to increased risk of offspring developing cancer in childhood (Contreras & others, 2017; Wang & others, 2017)
- Coverage of a recent study in which individuals whose mothers reported having higher levels of stress during pregnancy were at a higher risk of developing psychiatric disorders, such as mood disorders, later in life (Brannigan & others, 2019)
- Inclusion of a recent study that revealed prenatal maternal stress was associated with an increase in adolescent depressive symptoms (Davis & others, 2019)
- Discussion of a recent meta-analysis that concluded paternal smoking before and during pregnancy was linked to an increased risk of childhood leukemia (Cao, Lu, & Lu, 2020)

- Coverage of a recent study in which yoga was effective in reducing depressive symptoms in pregnant women (Ng & others, 2019)
- Inclusion of recent research indicating that pregnant women who exercised regularly in the second and third trimesters rated their quality of life higher (Krzepota, Sadowska, & Biernat, 2018)
- Description of a recent study that revealed regular exercise by pregnant women was linked to more advanced development in the neonatal brain (Laborte-Lemoyne, Currier, & Ellenberg, 2017)
- Updated data on the percentage of U.S. births attended by a midwife, which increased to 9.1 percent in 2017 (Center for Health Statistics, 2019)
- Coverage of a recent study in which one hour of traditional Thai massage decreased the duration of the first and second stage of labor (Sananpanichkul & others, 2019)
- Discussion of a recent large-scale study that found women who participated in CenteringPregnancy had offspring that were less likely to be born preterm or low birth weight (Cunningham & others, 2019)
- Inclusion of recent research that indicated women who participated in CenteringPregnancy used pain relief less during labor and were more likely to breast feed their infants (Rijnders & others, 2019)
- Coverage of a recent study of almost 27,000 births in the United States that found women giving birth in water had more favorable outcomes, including fewer prolonged first- and second-stage labors and less hemorrhaging (Snapp & others, 2020). Also in this study, newborns born in water were less likely to be transferred to a NICU, experience fetal heart rate abnormalities, or have respiratory complications.
- Update on cesarean delivery rates in the United States, which have declined from a high of 28.1 percent in 2009 to 25.9 percent in 2018 (Centers for Disease Control and Prevention, 2019)
- Updated data on the percentage of U.S. infants who are born preterm, including ethnic variations (March of Dimes, 2018)
- Updated weights for classification as a low birth weight baby, a very low birth weight baby, and an extremely low birth weight baby
- Coverage of a recent research review that concluded pregnant women's exercise was linked to a lower incidence of preterm birth (Matei & others, 2019)
- Coverage of a recent study that revealed a daily exercise program for 30 days improved the bone density and cortisol levels of very low birth weight preterm infants (Sezer Efe, Erdem, & Gunes, 2020)
- Updated data on the percentage of U.S. babies born at low birth weights, including ethnic variations (Centers for Disease Control and Prevention, 2018)
- Inclusion of a recent national study of 6- to 11-year-old children in which those born preterm had higher rates of developmental delay, intellectual disability, speech/language disorder, learning disability, and ADHD (Kelly & Li, 2019)
- Discussion of a recent study that revealed lower academic trajectories in elementary school for children born very preterm (Twilhaar & others, 2019)
- Description of recent research indicating that extremely preterm and low birth weight infants have lower executive function, especially in working memory and planning (Burnett & others, 2018)
- Coverage of a recent study that found kangaroo care promoted earlier initiation of breast feeding with preterm and low birth weight infants (Mekonnen, Yehualashet, & Bayleyegn, 2019)
- Inclusion of a recent large-scale experimental study in India in which low birth weight infants were randomly assigned to receive kangaroo care or standard care (Mazumder & others, 2019) and the kangaroo care infants had higher survival rates 30 days and 180 days after birth
- Description of a recent research review that concluded massage of preterm infants in the NICU was associated with shorter length of stay, reduced pain, improved weight gain, and better neurodevelopment (Pados & McGlothen-Bell, 2019). Also in this review, parents who massaged their preterm infants in the NICU reported experiencing less stress, anxiety, and depression.
- Discussion of a recent study in which parents trained in massage therapy conducted the therapy with their preterm infants, and their infants' weight, height, and head circumference increased faster than preterm infants who did not receive massage therapy (Zhang & Wang, 2019)
- Coverage of a recent meta-analysis that found 9 percent of fathers had postpartum depression within one month after birth, and 8 percent had it one to three months after birth (Rao & others, 2020)
- Inclusion of recent research in Japan indicating that 11.2 percent of fathers had postpartum depression one month after delivery (Nishigori & others, 2020)
- Description of a recent study that found fathers with postpartum depression had lower levels of responsiveness, mood, and sensitivity when interacting with their infants (Koch & others, 2019)

Chapter 4: Physical Development in Infancy

- Edits made based on comments by leading experts Charles Nelson and Martha Ann Bell
- Coverage of recent research documenting that attention (Bartolomeo & Seidel Malkinson, 2019) and emotion (Gainotti, 2019) are predominantly right-hemisphere activities
- New description of some of the aspects of brain activity that the brain imaging technique fNIRS can assess in infancy, including face processing, perception, attention, and memory (Emberson & others, 2019; Zhang & Roeyers, 2019)
- Coverage of a follow-up of children who were moved from an orphanage to stable foster care and showed improvement in brain functioning (Debnath & others, 2020)
- Discussion of World Health Organization (WHO) recommendations for the amount of quality sleep infants 0 to 3 months, 4 to 11 months, and 1 to 2 years should get daily (Willumsen & Bull, 2020)

- Inclusion of a recent study that found infants who were allowed to self-settle (that is, not nursed to sleep or rocked to sleep) showed increased duration of nighttime sleep during infancy (Hatch & others, 2019)
- Description of a recent research review that concluded the capacity to encode new memories is linked to sleep loss (Cousins & Fernandez, 2019)
- Discussion of a recent study that revealed persistent severe infant sleep problems were associated with prenatal and postnatal maternal depression (Cook & others, 2020)
- Coverage of a recent study in which a higher amount of screen time for infants was related to shorter sleep duration, with the link greater for those 6 months and under than for those 7 to 24 months in age (Chen & others, 2019)
- Inclusion of a recent study that found mothers who implemented a consistent bedtime routine had toddlers with longer sleep duration and fewer nighttime awakenings (Covington & others, 2019)
- Coverage of a recent study in which toddlers who experienced negative parenting but got adequate nighttime sleep had good self-regulation while those who encountered negative parenting and did not get adequate nighttime sleep had poor self-regulation (Julian & others, 2019)
- Discussion of a study of 732 cases of SIDS that found bedsharing occurred prior to 53 percent of the deaths (Drake & others, 2019)
- Description of recent research indicating that preterm birth is linked to a higher incidence of SIDS (Elhaik, 2019)
- Coverage of a recent study in which shorter sleep duration in infancy was linked to lower cognitive and language development at 2 years of age (Smithson & others, 2019)
- Discussion of a longitudinal study that found shorter sleep duration at 3, 8, and 24 months was related to inattentive and hyperactive symptoms at 5 years of age (Huhdanpaa & others, 2019)
- Description of a recent research review that concluded the neurotransmitter serotonin plays an important role in SIDS (Cummings & Leiter, 2020)
- Inclusion of research indicating no advantage or even less effective reaching and grasping when infants wear sticky mittens (Corbetta, Wiener, & Thurman, 2018)
- Coverage of a research review that concluded breast milk contains immunomodulating components that benefit the development of the immune system and provide defenses for fighting off disease (Nolan, Parks, & Good, 2019)
- Inclusion of a recent study that revealed breast feeding was associated with lower rates of being overweight, lower blood pressure, and smaller waist circumference at 12 years of age (Pluymen & others, 2019)
- Discussion of a recent study that revealed breast fed infants were less likely to develop a fever in the first six months of their lives (Saeed, Haile, & Cherlok, 2020)
- Coverage of a recent meta-analysis in which breast feeding was linked to a higher level of cardiovascular fitness in children 4 to 18 years of age (Berlanga-Macias & others, 2020)
- Description of a recent study that found slightly higher intelligence in children who had been breast fed as infants (Strom & others, 2019)
- New discussion of a recent study that found breast feeding mothers had lower hospitalization rates for cardiovascular problems and diabetes (Bartick & others, 2019)
- Coverage of a recent study in which African American mothers who participated in WIC had lower diet quality than WIC participants from other ethnic groups (Parker & others, 2020)
- Inclusion of a recent study that found the percentage of preterm births was lower among expectant mothers covered by Medicaid who received WIC benefits during pregnancy than their counterparts who did not receive WIC benefits (Sneji & Beltan-Sanchez, 2019)
- Description of a recent study that found high-risk infants in a WIC program had higher cognitive scores on the Bayley Scales of Infant Development (Lakshmanan & others, 2020)
- Greatly expanded content on the latest dynamic systems theory's model of motor development emphasizing that motor development is (1) embodied, (2) embedded, (3) enculturated, and (4) enabling (Adolph & Hoch, 2019)
- New content on a key aspect of motor development that involves behavioral flexibility to do what is necessary to accomplish life's everyday goals (Adolph & Hoch, 2019; Rachwani, Hoch, & Adolph, 2020). For example, infants' movements cannot be repeated in the same way across time and situations because their bodies, environments, and tasks change and require infants to engage in adaptive behavior.
- Updated and expanded content on eye tracking to include research on intermodal perception (Gergely & others, 2019), language (Comishen, Bialystok, & Adler, 2019), object categorization (LaTourrette & Waxman, 2019), and understanding of others' needs (Koster & others, 2019)
- Coverage of a recent study that found infants' looking times were highest for blue hues and lowest for yellow-green hues (Skelton & Franklin, 2020)

Chapter 5: Cognitive Development in Infancy

- Changes made based on comments by leading expert Martha Ann Bell
- Inclusion of a longitudinal study that found attention at 5 months was related to A-not-B performance at 10 months and also to executive function in early childhood and reading competence at 6 years of age (Blankenship & others, 2019)
- Added criticism of the core knowledge approach indicating that the modularity of the mind view does not adequately recognize the extensive connectivity of various regions of the brain
- Description of a recent study that found sustained attention in infancy was linked to better self-regulation in early childhood (Brandes-Aitken & others, 2019)
- Coverage of a recent study in which both joint attention and sustained attention at 9 months of age predicted vocabulary size at 12 and 15 months, but sustained attention was a better predictor of vocabulary size (Yu, Suanda, & Smith, 2019)

- Inclusion of a recent study that revealed initiation of joint attention is impaired at 12 months in children with autism spectrum disorder and language delay (Franchini & others, 2019)
- Coverage of a recent eye-tracking study that found 10- to 18-month-old infants who showed deficits in responding to others' joint attention bids and in initiating joint attention episodes were more likely to later be diagnosed with autism spectrum disorder (Nystrom & others, 2019)
- Description of a longitudinal study of participants from 1.5 to 16 years of age that revealed the age of first memory increased from 40 to 52 months as adolescents matured from 12 to 16 years of age (Reese & Robertson, 2019). In this study, individuals' differences in age of first memory were linked to the extent to which their mothers engaged in elaborative reminiscing.
- Discussion of a recent study in which infants at high risk for autism spectrum disorder used fewer gestures than their counterparts who were at low risk for autism spectrum disorders (Choi & others, 2019)
- Expanded content on Richard Aslin's conclusions that in addition to word segmentation, statistical learning has been documented as important in other domains such as musical tones, phonetic categories, sequences of visual shapes, sequences of motor responses, and combination of object parts in complex visual scenes
- Coverage of a recent study that revealed vocabulary comprehension at 23 months was linked to languages skills (morpheme knowledge and identification of correct sentences, for example) at 36 months of age (Friend & others, 2019)
- Description of a recent study in which learning new words at 21 months was associated with receptive vocabulary at 7 to 10 years of age (Rajan & others, 2019)
- Inclusion of a recent study that found parent coaching of 6- and 10-month-old infants involving the amount of child-directed speech, back and forth interactions, and parentese speech style improved the infants' language outcomes (more advanced babbling and greater word production) at 14 months of age (Ferjan Ramirez & others, 2019)
- Coverage of a recent study in which conversational turn counts at 18 to 24 months were linked to receptive and expressive vocabulary development 10 years later (Gilkerson & others, 2019)
- New discussion of English-speaking preschool children that revealed those from lower-income families had less advanced language-processing skills than children from middle- or high-income families, as well as a smaller vocabulary and syntax deficiencies (Levine & others, 2019)
- Discussion of a recent study that found children living in extreme poverty had much lower vocabulary and reading comprehension (Lervag & others, 2019)
- Description of a recent meta-analysis that concluded shared picture book reading was linked to children having better expressive and receptive language (Dowdall & others, 2020)
- Inclusion of a recent study that revealed higher rates of parent-child book reading interactions with 1- to 2.5-year-olds were linked to higher levels of receptive vocabulary, reading comprehension, and motivation to read in elementary school (Demir-Lira & others, 2019)

Chapter 6: Socioemotional Development in Infancy

- Revisions based on feedback from leading experts Martha Ann Bell and Pamela Cole
- New transition paragraph from the description of emotion in general to content on emotion regulation that emphasizes the positive, adaptive nature of emotion, which is reflected in our ability to regulate our emotions
- Discussion of a longitudinal study that revealed happiness at 1.5 years of age predicted intelligence in childhood (6 to 8 years of age) and educational attainment in adulthood (29 years of age) (Coffey, 2020)
- Description of recent research indicating that when fear was assessed at 6, 8, 10, and 12 months, it peaked at 10 months (Gartstein, Hancock, & Iverson, 2018)
- Coverage of a recent study that found children reported using more suppression and disengagement when experiencing early life stress, while adolescents used more engaging coping strategies when facing such stress (Johnson & others, 2019)
- Inclusion of a recent study in which maternal sensitivity was linked to better emotional self-regulation in 10-month-old infants (Frick & others, 2018)
- Coverage of a recent intervention study that involved training mothers to effectively use soothing techniques in the fourth week after birth, resulting in infants waking up less at night and crying less when assessed at 7, 11, and 23 weeks after birth (Ozturk Donmez & Temel, 2019)
- Description of a longitudinal study that found having a difficult temperament at 0 to 12 months of age predicted behavior problems at 36 months of age (Maltby & others, 2019)
- Inclusion of a recent meta-analysis that concluded secure attachment is linked to being more resilient (Darling Rasmussen & others, 2018)
- Discussion of a recent study that found an infant's secure attachment to its father was not enough to reduce the infant's stress reactivity when the mother-infant attachment was insecure (Kuo & others, 2019)
- Coverage of a recent study that indicated a higher level of testosterone in fathers in early infancy was linked to lower father-infant synchrony (Gordon & others, 2017). Also in this study, fathers with high testosterone levels had lower oxytocin levels and engaged in less touching of their infants than father with average or low levels of testosterone.
- Description of a recent study in which destructive marital conflict was linked to lower levels of coparenting alliance (Kopyslynska, Barnett, & Curran, 2020)
- Inclusion of a recent study revealing that higher levels of anxiety and depression symptoms in mothers during the last trimester of pregnancy was associated with increased rates of infants' externalizing problems at 2 years of age, and a higher level of these symptoms in fathers during the last trimester of

pregnancy was related to higher levels of infants' internalizing and externalizing problems at 14 months of age (Hughes & others 2020)

- Coverage of a recent study involving the Bringing Home Baby project in which fathers who participated in the program felt more appreciated by their wives, and mothers were more satisfied with the division of labor when fathers were more involved in parenting (Shapiro, Gottman, & Fink, 2020)

Chapter 7: Physical and Cognitive Development in Early Childhood

- Coverage of a recent study in which the physical and socio-emotional health-related quality of life of children with growth hormone deficiency increased one year after they received growth hormone treatment (Quitmann & others, 2019)
- Description of a recent study that found maltreatment risk and home adversity in infancy were linked to cortical delays and brain immaturity at 8 years of age (Bick & others, 2019). However, children assigned to a biobehavioral catchup treatment showed improved brain functioning.
- Discussion of a recent research review that concluded advances in gross motor skills in early childhood are linked to better expressive and receptive language development (Gonzalez, Alvarez, & Nelson, 2019)
- Coverage of recent guidelines for 3- to 4-year-old children's sleep by the World Health Organization (WHO) recommending 10 to 13 hours of good quality sleep, including a nap, with consistent sleep and wake-up times (Willumsen & Bull, 2020)
- Inclusion of a recent study of 3-year-old children in which family irregularity was associated with shorter sleep duration and later sleep onset (Koopman-Verhoeff & others, 2019)
- Description of a recent study that found better-quality mother-child and father-child interactions were linked to preschool children's longer sleep duration (Dubois-Comptois & others, 2019)
- Discussion of a recent Chinese study that revealed sleep deprivation in early childhood was associated with ADHD in middle and late childhood (Tso & others, 2019)
- Coverage of a recent national study in which children's dietary quality decreased from 6 months to 4 years of age (Hamner & Moore, 2020)
- Inclusion of a recent study in which positive parenting that emphasized praise for healthy eating behavior improved young children's eating behavior and helped overweight children lose weight faster than negative comments by parents did (Rotman & others, 2020)
- Updated data on the percentage of U.S. 2- to 5-year-olds who are obese, which increased to 13.9 percent in 2015–2016 (Hales & others, 2017)
- Discussion of WHO's recommendation that 3- to 4-year-old children engage in no more than 1 hour of sedentary screen time daily (Willumsen & Bull, 2020)
- Inclusion of a recent study that revealed 3- to 4-year-old African American children and children who lived at or below the poverty level were more likely than other young children to engage in more than 1 hour of screen time (Kracht, Webster, & Staiano, 2020)
- Coverage of a recent Chinese study in which longer TV viewing time was linked to an increase in 4- to 5-year-olds' overweight/obesity status (Hu & others, 2019)
- Description of the World Health Organization's recent guidelines for 3- to 4-year-olds' physical activity which recommend 3 hours per day of engaging in a variety of physical activities of any intensity, of which at least 60 minutes should be moderate- to vigorous-intensity physical activity, spread throughout the day (Willumsen & Bull, 2020)
- Update on changes in the leading causes of death in young children, with malignant neoplasms and homicides now the third and fourth leading causes of death and drowning and congenital malformation continuing to be the first and second leading causes, respectively (Centers for Disease Control and Prevention, 2019)
- Discussion of a recent national study that found children with a smoker in the home were 30 percent more likely to have an asthma diagnosis than children who did not have a smoker in the home (Xie & others, 2020)
- Coverage of a recent study in which young children exposed to environmental smoke were more likely to have hyperactivity and conduct problem symptoms than their counterparts who were not exposed to environmental smoke (Gatzke-Kopp & others, 2020)
- Discussion of a recent study that revealed mothers who engaged in sensitive parenting had children who used more private speech (Day & Smith, 2019)
- Description of a recent study in which executive attention was a good predictor of self-regulation (Tiego & others, 2020)
- Inclusion of recent research on 3- to 6-year-olds that found the volume of their autographical memories was linked to the volume of their self-knowledge (Ross, Hutchison, & Cunningham, 2020)
- Description of a recent research review that concluded interviewer support is linked to children's memory accuracy (Saywitz & others, 2019)
- Discussion of a recent study of preschool children in which conditions of socioeconomic disadvantage exerted a stressful influence on parent-child interactions and on young children's emergent executive function skills (Baker & Brooks-Gunn, 2020)
- Inclusion of a recent study of children in low-income families in Ghana that indicated executive function assessed at 5 years of age predicted higher subsequent literacy and math skills across the next two years (Wolf & McCoy, 2019)
- Coverage of a recent study in which higher parent education predicted children's superior executive function, whereas harsh parenting forecasted children's lower executive function (Halse & others, 2019)
- Description of a recent study of preschool children in which a lower level of executive function was associated with inattention and hyperactivity (Landis & others, 2020)

- Coverage of a recent study in which a lower level of executive function in preschool children was linked to onset and worsening of attention deficit hyperactivity disorder and depression at 6 to 12 years of age (Hawkey & others, 2019)
- Description of a recent study that found fathers' autonomy support improved young children's executive function (Meuwissen & Carlson, 2018)
- Discussion of a recent study that indicated teachers who conducted a 6-week small-group training program that focused on mindfulness and reflective thinking improved young children's executive function better than a business-as-usual condition, but a literacy training program was as effective in improving their executive function as the mindfulness and reflective thinking condition (Zelazo & others, 2018)
- Coverage of a recent cohort study that revealed young children in the 2000s are delaying gratification longer than their counterparts in the 1960s and 1980s, including content about why this might be happening (Carlson & others, 2018)
- Inclusion of a recent study of 3- to 5-year-old children that revealed earlier development of executive function predicted higher theory of mind performance, especially for false-belief tasks (Doenyas, Yavuz, & Selcuk, 2018)
- Coverage of an experimental study in which young children in high-poverty urban areas who were randomly assigned to participate in Montessori programs over a 3-year period fared better on academic achievement, social understanding, and mastery orientation than children who did not receive this intervention (Lillard & others, 2017)
- Inclusion of a recent study in which young children who attended Montessori schools displayed higher creativity than their counterparts in traditional schools (Denervaud & others, 2019)
- New description of an early-childhood intervention initiated by Jeff Bezos, CEO of Amazon, who recently provided 2 billion dollars to fund a new network of preschools in underserved communities that he says will be Montessori-inspired
- Discussion of an early childhood intervention designed to improve preschool children's developmental outcomes and to support the Head Start programs they attended in a high-violence, high-crime area of Chicago (Watts & others, 2018). The program was effective in improving the children's executive function and academic achievement but not their behavioral outcomes 10 to 11 years after the intervention.
- Coverage of a recent study of 3- to 4-, 5- to 6-, and 8- to 9-year-olds that found children in foster care who participated in Head Start programs had better cognitive, socioemotional, and health outcomes than their foster care counterparts who did not attend Head Start programs (Lee, 2020)

Chapter 8: Socioemotional Development in Early Childhood

- Coverage of a recent study that found by 5 years of age, children made both character and behavior judgments based on others' facial characteristics (Charlesworth & others, 2019). For example, they were more likely to give a gift to others with trustworthy and submissive facial expressions.
- Description of a recent study in which young children with higher emotion regulation were more popular with their peers (Nakamichi, 2020)
- Inclusion of a recent study that revealed low emotion regulation at age 5 was associated with emotional and school problems at age 10 (Perry & others, 2018a)
- New discussion of a longitudinal study in which a low level of emotion regulation in early childhood was linked to a higher level of externalizing problems in adolescence (Perry & others, 2018b)
- Coverage of a recent study that found emotion-dismissing mothers' parenting was linked to toddlers' lower emotional competence, while mothers' emotion-coaching parenting was associated with their toddlers' higher emotional competence (Ornaghi & others, 2019)
- Description of a recent study of 3- to 4-year-olds that indicated paternal emotion coaching predicted children's positive emotional expression one year later (Gerhardt & others, 2020)
- Description of a recent study in which 3-year-old boys with higher prenatal testosterone levels had shorter delay of gratification capabilities and more attention problems (Korner & others, 2019)
- Discussion of a recent study of 4- to 9-year-olds in which gender-nonconforming children were perceived more negatively than gender-conforming children (Kwan & others, 2020). Also in this study, gender-nonconforming boys were perceived more negatively than gender-nonconforming girls.
- Coverage of a recent study of 3- to 7-year-olds that revealed boys were more likely than girls to engage in gender stereotyping, especially with masculine stimuli such as toys, and to be sanctioned for not conforming to gender stereotypes (Skocajic & others, 2020)
- Description of a recent study in which authoritarian parenting was associated with being a bully perpetrator in adolescence (Krisnana & others, 2020)
- Inclusion of a recent study that found authoritarian parenting was linked to all forms of child maltreatment, while authoritative parenting was associated with a lower risk for all types of child maltreatment (Lo & others, 2019)
- Coverage of a recent study in which daughters were less likely than sons to be physically punished by both parents (Mehlhasen-Hassoen, 2019)
- Updates on the controversy about whether research adequately documents that physical punishment has detrimental effects on children's development (Gershoff & others, 2019; Larzelere & others, 2019)
- Discussion of recent research that revealed coparenting when children were 3 to 5 years of age was linked to less externalizing problems 8 to 10 years later (Parkes, Green, & Mitchell, 2019)
- Coverage of a recent study of low-income, unmarried couples that revealed cooperative coparenting at earlier stages of development resulted in fewer behavior problems later in childhood (Choi, Parra, & Jiang, 2019)
- Updated data on the extent of child maltreatment in the United States, including new data on specific types of abuse

- Inclusion of a recent large-scale Canadian study in which a history of child maltreatment involving either physical abuse or sexual abuse was linked to physical and mental health problems in adulthood (Cameranesi, Lix, & Piotrowski, 2019)
- Coverage of a recent study that found child maltreatment was associated with increased rates of psychiatric problems and substance abuse in adulthood (Wang & others, 2020)
- Discussion of a recent study in which child maltreatment was linked to increased emotion-focused coping and decreased problem-solving coping (VanMeter, Handley, & Cicchetti, 2020)
- Inclusion of a recent large-scale study in which social support and coping skills were linked to positive adult mental health outcomes for maltreated children (Su, D'Arcy, & Meng, 2020)
- Description of two recent national surveys focusing on various issues in working parent families (Career Builder, 2018; Livingston & Bialik, 2018)
- Coverage of research indicating that low SES in childhood was linked to lower cognitive function and greater cognitive decline in middle and late adulthood (Liu & Lachman, 2019). Also in this study, paternal discipline and high affection were positively associated with adult cognition function in children living in low-SES conditions, while paternal discipline was negatively related to adult cognition in children living in high-SES conditions.
- Inclusion of a recent study of preschool children in which frequent expressions of anger predicted lower social competence in peer relations one year later (Lindsey, 2019)
- Description of recommendations by the World Health Organization (WHO) that 3- to 4-year-old children engage in no more than 1 hour of screen time daily (Willumsen & Bull, 2020)
- Coverage of a recent study that revealed 3- to 4-year-old children and children who lived at or below the poverty line were more likely to engage in more than 1 hour of screen time compared with other children (Kracht, Webster, & Staiano, 2020)
- Inclusion of a recent study of 2- to 5-year-olds in which television/DVD/video viewing was negatively linked to young children's social skills, while outdoor play was positively associated with social skills (Hinkley & others, 2018)
- Discussion of a recent study of preschool children in which those who engaged in screen time 2 or more hours per day were much more likely to have inattention problems (including a higher risk of developing ADHD symptoms) and externalizing problems than children who engaged in screen time less than 30 minutes per day (Tamana & others, 2019)
- Description of a recent Australian study in which children and adolescents from lower-SES backgrounds were less likely to achieve a healthy level of physical fitness than their higher-SES counterparts (Peralta & others, 2019)
- New opening commentary in the section on Ethnicity focused on the importance of not using a deficit model in studying ethnic minority adolescents and of recognizing not just stressors in their lives but also positive aspects of their lives (Bornstein & Cote, 2019; Perreira & others, 2019)
- Updated data on the percentage of children 18 years of age or younger from different ethnic groups as well as predictions regarding when ethnic minority children will begin to outnumber non-Latino White children in the United States (U.S. Census Bureau, 2018)
- Coverage of a recent study in which immigrant children who had experienced separation from their parents had lower levels of literacy and higher levels of psychological problems than those who had migrated with their parents (Lu, He, & Brooks-Gunn, 2020). Also in this study, a protracted period of separation and prior undocumented status of parents further increased the children's disadvantages.

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

- Description of a recent study of 9- to 10-year-olds in which children with a high body mass index has less cortical thickness, which was linked to a lower level of executive function (Laurent & others, 2020)
- Coverage of recent research indicating that emerging cognitive control in children is mainly supported by the development of distributed neural networks in which the prefrontal cortex is central (Chevalier & others, 2019)
- Inclusion of a recent study in which reduced amygdala-prefrontal connectivity occurred in children with autism spectrum disorder (Ibrahim & others, 2019)
- Discussion of a recent study that examined children's physical activity in the transition from elementary to middle school (Pate & others, 2019). In this study, the following activities were associated with children's greater engagement of physical activity: parental encouragement and support of physical activity, time children spent outdoors, children's sports participation, and number of activity facilities near their home.
- Coverage of a recent study of 3- to 18-year-olds that found regular physical activity and higher levels of calcium intake improved their bone health (Yang & others, 2020)
- Description of a meta-analysis that concluded prolonged exercise interventions with 6- to 12-year-olds were effective in improving the children's executive function in general and their inhibitory control in particular (Xue, Yang, & Huang, 2019)
- Discussion of a recent research review of Chinese children that revealed lack of access to fruit and vegetable markets was linked to childhood obesity (Wang & others, 2020)
- Inclusion of a recent study in which high levels of screen time at 11 years of age was linked to increased body mass index 3 years later (Engberg & others, 2020)
- Updated data on the percentage of children who are obese, with continuing increases through 2015–2016 (Hales & others, 2017)
- Description of a recent Chinese study in which children and adolescents who were obese were more likely to have depression and anxiety symptoms than their non-obese counterparts (Wang & others, 2019)