

The Developing Person

Through
Childhood and
Adolescence Tenth
Edition

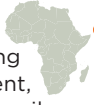
Kathleen Stassen Berger

Highlights of the Science of Human Development

As evident throughout this textbook, much more research and appreciation of the brain, social context, and the non-Western world has expanded our understanding of human development in the twenty-first century. This timeline lists a few highlights of the past.

200,000-50,000 BCE

With their large brains, long period of child development, and extensive social and family support, early humans were able to sustain life and raise children more effectively than other primates.



c. 400 BCE In ancient Greece, ideas about children from philosophers like Plato (c. 428-348 BCE) and Aristotle (384-322 BCE) influenced further thoughts about children. Plato believed children were born with knowledge. Aristotle believed children learn from experience.



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1650-1800 European philosophers like John Locke (1632-1704) and Jean-Jacques Rousseau (1712-1778) debate whether children are born as “blank slates” and how much control parents should take in raising them.



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1797 First European vaccination: Edward Jenner (1749-1823) publicizes smallpox inoculation, building on vaccination against smallpox in Asia, the Middle East, and Africa.

1750-1850 Beginning of Western laws regulating child labor and protecting the rights of children.

1879 First experimental psychology laboratory established in Leipzig, Germany.

1885 Sigmund Freud (1856-1939) publishes *Studies on Hysteria*, one of the first works establishing the importance of the subconscious and marking the beginning of the theories of psychoanalytic theory.



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1895 Ivan Pavlov (1849-1936) begins research on dogs' salivation response.



AGENCY ANIMAL PICTURE/GETTY IMAGES

1905 Max Weber (1864-1920), the founder of sociology, writes *The Protestant Work Ethic*, about human values and adult work.

1905 Alfred Binet's (1857-1911) intelligence test published.

1907 Maria Montessori (1870-1952) opens her first school in Rome.



HARVEY WATTS PHOTOGRAPHY/GETTY IMAGES

1913 John B. Watson (1878-1958) publishes *Psychology As the Behaviorist Views It*.

50,000 BCE

400 BCE

0

500

1000

1500

1650

1700

140 BCE In China, imperial examinations are one of the first times cognitive testing is used on young people.

500-1500 During the Middle Ages in Europe, many adults believed that children were miniature adults.



SCALA ART RESOURCE, NY

1100-1200 First universities founded in Europe. Young people pay to be educated together.



NICHOLAS VEASEY/GETTY IMAGES



RALF HETTLER/GETTY IMAGES

1837 First kindergarten opens in Germany, part of a movement to teach young children before they entered the primary school system.

1859 Charles Darwin (1809-1882) publishes *On the Origin of Species*, sparking debates about what is genetic and what is environmental.

1900 Compulsory schooling for children is established for most children in the United States and Europe.



RALF HETTLER/GETTY IMAGES

1903 The term “gerontology,” the branch of developmental science devoted to studying aging, first coined.



FUSE/GETTY IMAGES

1920 Lev Vygotsky (1896-1934) develops sociocultural theory in the former Soviet Union.

1923 Jean Piaget (1896-1980) publishes *The Language and Thought of the Child*.



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1933 Society for Research on Child Development, the preeminent organization for research on child development, founded.

1939 Mamie (1917-1983) and Kenneth Clark (1914-2005) receive their research grants to study race in early childhood.



JGI/JAMIE GRILL/GETTY IMAGES

1943 Abraham Maslow (1908–1970) publishes *A Theory of Motivation*, establishing the hierarchy of needs.

1950 Erik Erikson (1902–1994) expands on Freud's theory to include social aspects of personality development with the publication of *Childhood and Society*.



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1951 John Bowlby (1907–1990) publishes *Maternal Care and Mental Health*, one of his first works on the importance of parent-child attachment.



MONKEY BUSINESS IMAGES/SHUTTERSTOCK

1953 Publication of the first papers describing DNA, our genetic blueprint.



DIGITAL VISION VECTORS/GETTY IMAGES

1957 Harry Harlow (1905–1981) publishes *Love in Infant Monkeys*, describing his research on attachment in rhesus monkeys.



MARTIN ROGERS/GETTY IMAGES

1961 The morning sickness drug thalidomide is banned after children are born with serious birth defects, calling attention to the problem of teratogens during pregnancy.

1961 Alfred Bandura (b. 1925) conducts the Bobo Doll experiments, leading to the development of social learning theory.

1979 Urie Bronfenbrenner (1917–2005) publishes his work on ecological systems theory.

1986 John Gottman (b. 1942) founded the “Love Lab” at the University of Washington to study what makes relationships work.

1987 Carolyn Rovee-Collier (1942–2014) shows that even young infants can remember in her classic mobile experiments.



FOTORESEARCH/PHOTOS/SEARCH/SUPERSTOCK

1990 The United Nations treaty *Convention on the Rights of the Child* in effect, requiring the best interests of children be no longer considered solely the possession of their parents. Currently all UN nations have signed on, except Somalia, South Sudan, and the United States.



TONGRO/GETTY IMAGES

1993 Howard Gardner (b. 1943) publishes *Multiple Intelligences*, a major new understanding of the diversity of human intellectual abilities. Gardner has since revised and expanded his ideas in many ways.

1800

1900

2000



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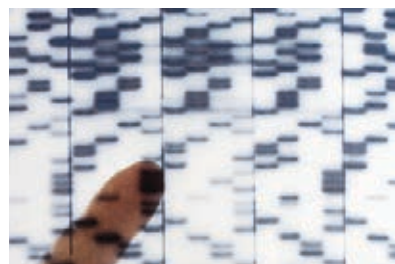
1953 B.F. Skinner (1904–1990) conducts experiments on rats and establishes operant conditioning.

1955 Emmy Werner (b. 1929) begins her Kauai study, which focuses on the power of resilience.



DONNA DAY/EXACT/ISTOCK/1589/SUPERSTOCK

1956 K. Warner Schaie's (b. 1928) Seattle Longitudinal Study of Adult Intelligence begins.



TETRA IMAGES/GETTY IMAGES

1965 Head Start, an early-childhood-education program, launched in the United States.

1965 Mary Ainsworth (1913–1999) starts using the “Strange Situation” to measure attachment.



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1966 Diana Baumrind (b. 1928) publishes her first work on parenting styles.

1972 Beginning of the Dunedin, New Zealand, study—one of the first longitudinal studies to include genetic markers.

1990–Present New brain imaging technology allows pinpointing of brain areas involved in everything from executive function to Alzheimer's disease.



BARIS SIMSEK/GETTY IMAGES

1990 Barbara Rogoff (b. 1950) publishes *Apprenticeship in Thinking*, making developmentalists more aware of the significance of culture and context. Rogoff provided new insights and appreciation of child-rearing in Latin America.

1994 Steven Pinker (b. 1954) publishes *The Language Instinct*, focusing attention on the interaction between neuroscience and behavior, helping developmentalists understand the need for physiological understanding as part of human growth. These themes continue in his later work, such as *How the Mind Works* in 1997.

1995–Present Onward. There are many more discoveries and research chronicled in this book.

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and Adolescence



TENTH EDITION

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Kathleen Stassen Berger

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About the Author

Kathleen Stassen Berger received her undergraduate education at Stanford University and Radcliffe College, then earned an MAT from Harvard University and an MS and PhD from Yeshiva University. Her broad experience as an educator includes directing a preschool, serving as chair of philosophy at the United Nations International School, and teaching child and adolescent development to graduate students at Fordham University in New York and undergraduates at Montclair State University in New Jersey and Quinnipiac University in Connecticut. She also taught social psychology to inmates at Sing Sing Prison who were earning their paralegal degrees.

Currently, and for most of her professional career, Berger is a professor at Bronx Community College of the City University of New York, where she began as an adjunct in English and for the past decades has been a full professor in the Social Sciences department, which includes sociology, economics, anthropology, political science, human services, and psychology. She has taught introduction to psychology, child and adolescent development, adulthood and aging, social psychology, abnormal psychology, and human motivation. Her students—who come from many ethnic, economic, and educational backgrounds and who have a wide range of ages and interests—consistently honor her with the highest teaching evaluations.

Berger is also the author of *The Developing Person Through the Life Span* and *Invitation to the Life Span*. Her developmental texts are currently being used at more than 700 colleges and universities worldwide and are available in Spanish, French, Italian, and Portuguese, as well as English. Her research interests include adolescent identity, immigration, bullying, and grandparents, and she has published articles on developmental topics in the *Wiley Encyclopedia of Psychology* and in publications of the American Association for Higher Education and the National Education Association for Higher Education. She continues teaching and learning from her students as well as from her four daughters and three grandsons.



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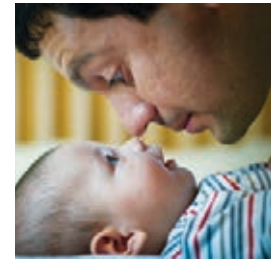
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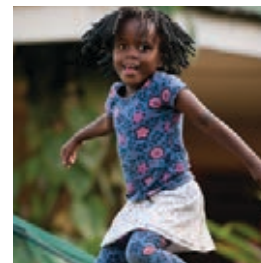
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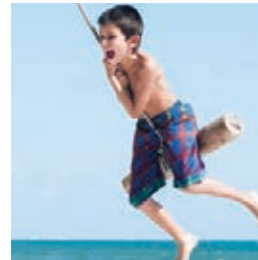
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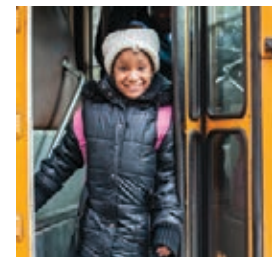
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Preface

My grandson, Asa, is in early childhood. He sees the world in opposites: male/female, child/grown-up, good guys/ bad guys. He considers himself one of the good guys, destroying the bad guys in his active imagination and in karate kicks in the air.

Oscar, his father, knows better. He asked me if Asa really believes there are good guys and bad guys, or is that just a cliché. I said that most young children believe in simple, straightforward opposites.

Undeterred, Oscar told Asa that he knows some adults who were once bad guys but became good guys.

“No,” Asa insisted. “That never happens.”

Asa is mistaken. As he matures, his body will grow taller and become better able to sit with feet on the floor, not kicking. His thoughts will include the idea that people change as they grow older, a theme throughout this book. What Asa says “never happens” occurs every day—none of us is a bad guy or a good guy, but all of us keep developing, ideally for the better.

Oscar is not alone in his awareness. Many folk sayings affirm development: People “turn over a new leaf,” are “born-again”; parents are granted a “do-over” when they become grandparents; today is “the first day of the rest of your life.” We recognize that the past never disappears and that parents always influence children, as in the saying “The apple does not fall far from the tree,” but we also recognize many other genetic, biological, and social influences on each person, as detailed in the best-selling book *Far from the Tree* (Solomon, 2012).

The complexity, the twists and turns, the endless variety of the human experience at every age is fascinating to me, which is why I continue to study human development and revise this textbook, with new insights as well as new words and topics in every edition.

We all have echoes of Asa in us: We want life to be simple, for people to be good guys. But life is not simple. Learning about human development helps everyone respond to life’s variations and influences, not with imaginary kicks but with wise responses. Knowledge does that. In a vivid example, Stephen Pinker (2011) finds that humans kill each other less now than they did in previous centuries; he cites education as one reason.

Education occurs in many ways. This textbook is only one of them—an aid to understanding the complexity of your life, my life, and the lives of all the estimated 19 billion humans alive now or who once lived. Nonetheless, although life experiences and thousands of other books add to our education, writing this text is my contribution and studying it is yours. Together we might learn how to limit the bad and increase the good in each of us as time goes on.

New Material

Every year, scientists discover and explain more concepts and research. The best of these discoveries are integrated into the text, including hundreds of new references on many topics—among them epigenetics at conception, prenatal protections, infant nutrition, autism spectrum disorders, attachment over the life span, high-stakes testing, drug use and drug addiction, sex education, and diversity of all



Pondering My grandson, Asa, looks thoughtfully at his father, Oscar.

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kinds (ethnic, economic, and cultural). Cognizant of the interdisciplinary nature of human development, I include recent research in biology, sociology, education, anthropology, political science, and more—as well as my home discipline, psychology.

Genetics and social contexts are noted throughout. The interaction of nature and nurture are discussed in many chapters, as neuroscience relates to research on family life. Among the many topics described with new research are the variations, benefits, and hazards of breast-feeding, infant day care, preschool education, single parenthood, and peer group pressures. Both my academic history and my human experience compel me to always note differences, deficits, and resilience.

New Pedagogical Aids

This edition incorporates learning objectives at the beginning of each chapter: The “What Will You Know?” questions indicate important ideas or provocative concepts—one for each major section of the chapter. After each major section, a medial summary repeats the main ideas of that section and then “What Have You Learned?” questions help students review what they have just read.

Learning Objectives

Much of what students learn from this course is a matter of attitude, approach, and perspective—all hard to quantify. Specific learning objectives arise from the “What Have You Learned?” questions, which now appear at the end of each major section rather than at the end of each chapter, as well as from the Key Terms that appear in bold in the text, defined in the margins, listed after each chapter and again in the glossary. You will notice that those Key Terms are repeated several times after they are defined, to reinforce learning and understanding.

Ideally, students will answer the learning objective questions in complete sentences, with specifics that demonstrate knowledge. Some items on the new lists are straightforward, requiring only close attention to the chapter content. Others require comparisons, implications, or evaluations. Cognitive psychology and research on pedagogy have shown that vocabulary, specific knowledge, and critical thinking are all part of learning. These features are designed to foster all three.



FLUSE/GETTY IMAGES

Healthy? Children have high energy but small stomachs, so they enjoy frequent snacks more than big meals. Yet snacks are typically poor sources of nutrition.

New Opposing Perspectives Boxed Feature and Updated A View from Science and A Case to Study Features

We all need critical thinking skills. Virtually every page of this book presents not only facts but also questions with divergent interpretations. A new boxed feature called *Opposing Perspectives* appears in this edition of *The Developing Person Through Childhood and Adolescence* for the first time. This box focuses on exciting and controversial topics—from prenatal sex selection to e-cigarettes. I have tried to present information and opinions on both sides of an issue so that students can practice weighing evidence, assessing arguments, and coming to their own conclusions.

In addition, the boxes titled *A View from Science*, which explain surprising insights from recent scientific research, and *A Case to Study*, which illustrate developmental issues through the story of specific individuals, have been extensively updated. All these new features are included in the Table of Contents.

New Visualizing Development

Also new to this edition are full-page illustrations of key topics in development. Every chapter now includes an infographic display of data on key issues ranging from the biology of twin births to the milestones in the journey to emerging adulthood across the world. These illustrations combine global statistics, maps, charts, and photographs. Aware of the many modalities of learning, I have worked closely with noted designer Charles Yuen to use these infographics to reinforce key ideas.

New Online Data Connections Activities

Understanding how we use data as developmentalists is an important part of what students learn in their courses. Data is a crucial part of understanding that developmental science is a science—and not just common sense. In this edition, I have created interactive activities based on important data from rates of breast-feeding to risk taking in adolescence. These are designed for students to be able to practice interpreting data.

For example, how do rates of breast-feeding differ by state across the United States and around the world, or how do rates of various risk-taking behaviors differ by gender or age during adolescence? These interactive activities are designed to engage students, make them more active learners, help them retain important material, and develop a deeper understanding of the quantitative data that we use in development. Instructors can assign these activities in the online LaunchPad that accompanies this book.

Child Development and Nursing Career Correlation Guides

Many students taking this course will be interested in future careers in nursing or early child development. This book and accompanying testing material are fully correlated to the NAEYC (National Association for the Education of Young Children) career preparation goals and the NCLEX (nursing) licensure exams.

Content Changes in the Tenth Edition

Child and adolescent development, like all sciences, builds on past learning. Many facts and concepts are scaffolds that remain strong over time: stages and ages, norms and variations, dangers and diversities, classic theories and fascinating applications. However, the study of development is continually changed by



BRITTA KASHOLM/TENGVE/GETTY IMAGES

Bonded That fathers enjoy their sons is not surprising, but notice the infant reaching for Dad’s face. At this age, infants show their trust in adults by grabbing and reaching.

KUTTIQ/RF KIDS/ALAMY



Family Pride Grandpa Charilaos is proud of his tavern in northern Greece (central Macedonia), but he is even more proud of his talented grandchildren, including Maria Soni (shown here). Note her expert fingering. Her father and mother also play instruments; is that nature or nurture?

discoveries and experiences, so no paragraph in this tenth edition is exactly what it was in the first edition, and only a few are exactly like the ninth.

Highlights of updates in the text appear below.

Part I. The Beginnings

1. Introduction

- New chapter opener on Professor Berger's experience at the birth of her grandson, Caleb, illustrates some of the reasons for the study of human development
- Discussion of the three domains of development brought forward in the chapter
- Differential susceptibility illustrated with example of children with a particular version of the serotonin transporter gene 5-HTTLPR
- Rationale for the shift by developmentalists from studying only the period of birth through adolescence to studying the entire life span explained in full
- The difference-equals-deficit error defined and discussed
- Expanded section on sexual orientation
- New *Opposing Perspectives* box considers use of the word *race*
- Plasticity now discussed in the context of the dynamic-systems approach
- New *A View from Science* box discusses the fear of a vaccination–autism link
- *Visualizing Development: Diverse Complexities*

2. Theories

- New chapter opener illustrates three aspects shared by all theories: (1) behavior can be surprising, (2) humans develop theories to explain everything, and (3) experience and culture matter
- A separate major section now devoted to discussion of each theory
- Classical conditioning illustrated by example of *white coat syndrome*
- Discussion of information processing expanded with inclusion of new insights from neuroscience, including photos comparing brain scans of healthy adults with those of adults who were diagnosed with ADHD as children
- Physical therapists' tailoring of treatment regimes to each patient used as an example of guiding someone through the zone of proximal development
- The introduction to the universal perspective (humanism and evolutionary theory) has been expanded
- In discussion of humanism: long-term effects on children whose parents did not have unconditional positive regard for them
- In discussion of evolutionary theory: a new subsection on evolution and culture
- *Visualizing Development: Breast-feeding Diversity*

3. The New Genetics

- Major sections reorganized for smoother information flow
- Expanded explanation of genes includes discussion of epigenetics
- In discussion of genetic variations: a new paragraph on *jumping* discusses transfer of some genetic material from one chromosome to the other when sperm and ova pair up
- New section on male/female differences in infertility
- Expanded section on IVF
- *Visualizing Development: One Baby or More*

4. Prenatal Development and Birth

- New chapter opener about the birth of Professor Berger's grandson illustrates constancies in prenatal development and birth as well changes in culture and context over time

- Section on the final three months of pregnancy reorganized to include subsections on organ maturation and the mother–child relationship
- Expanded section on cesarean delivery, including a paragraph on negative factors that appear months to years after birth
- Behavioral teratogens now discussed in a separate subsection
- New *A View from Science* box discusses conflicting advice given to pregnant women about their health and potential teratogens
- New subsection *What Do We Know?* raises questions about the state of our knowledge of teratogens and their effects
- Discussion of low birthweight now a separate major section
- New subsection on family bonding
- *Visualizing Development: A Healthy Newborn*

Part II. The First Two Years

5. The First Two Years: Biosocial Development

- *Failure to thrive* now discussed early in the chapter in explanation of percentile rankings
- New comparison of infants' sleep patterns in various cultures
- New figure (5.3) indicates percentage of co-sleeping infants in 14 countries
- New subsection on specialization of brain areas
- In section on brain development: a significantly expanded subsection on transient exuberance of dendrites and pruning
- Expanded introduction to the section on motor skills
- New subsection on dynamic sensory-motor systems in discussion of motor skills
- New *A Case to Study* box on SIDS
- *Visualizing Development: Nature, Nurture, and the Brain*

6. The First Two Years: Cognitive Development

- New chapter opener about Professor Berger's conversation with a dentist parallels steps in the development of infant cognition
- New *A View from Science* box explores insights from modern research about Piaget's stage theory
- fNIRS (functional near infrared spectroscopy) has been added to the list (and illustration) of techniques used by neuroscientists to understand brain function
- Revised and expanded introduction to information-processing theory
- In section on information processing: discussion of memory has been substantially reorganized and revised
- Research on the ability of infants of bilingual mothers ability to distinguish between the two languages has been added
- New research on cultural differences in what sounds infants prefer
- Discussion of *mean length of utterance (MLU)* as a measure of a child's language progress
- *Visualizing Development: Early Communication and Language Development*

7. The First Two Years: Psychosocial Development

- Chapter substantially reorganized: new major section *Brain and Emotions*; *The Development of Social Bonds* major section brought forward and now precedes the major section *Theories of Infant Psychosocial Development*
- Expanded discussion of infants' experience of fear
- *Growth of the Brain* section significantly revised: now includes discussion of how cultural differences are encoded in the brain as well as revised subsections on development of social impulses and on stress



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Proud Peruvian In rural Peru, an early-education program (Pronoei) encourages community involvement and traditional culture. Preschoolers, like this girl in a holiday parade, are proud to be themselves, and that helps them become healthy and strong.



Bliss for Boys But not for moms. Finger painting develops fine motor skills, which is part of the preschool curriculum in early childhood. This boy shows why most stay-home 3-year-olds miss out on this joy.



No Toys Boys in middle childhood are happiest playing outside with equipment designed for work. This wheelbarrow is perfect, especially because at any moment the pusher might tip it.

- Section on behaviorism and social learning now includes research showing that variations in proximal and distal parenting lead to variations in toddler behavior
- New sections on how humanism and evolutionary theory explain infant psychosocial development
- Section on infant day care substantially revised and reorganized; now includes a new *A View from Science: The Mixed Realities of Infant Day Care*
- *Visualizing Development: Developing Attachment*

Part III. Early Childhood

8. Early Childhood: Biosocial Development

- *Child Maltreatment* now a major section
- New research on nutrition, including long-term effects of childhood obesity
- Section on nutritional deficiencies revised and expanded
- Intellectual disability as a result of failure of the corpus callosum to develop
- Expanded section on stress hormones and their impact
- New *A View from Science: Eliminating Lead* includes illustration of the effects of lead exposure on the brain
- New subhead *Accuracy of State Data* discusses inconsistencies in how different states report child maltreatment
- New subsection presents new research on long-term impact of child maltreatment on development of social skills
- *Visualizing Development: Developing Motor Skills*

9. Early Childhood: Cognitive Development

- New chapter opener presents cognitive characteristics of a young child as exemplified in Professor Berger’s conversation with her young grandson when he tried to convince her to play an imaginary basketball game
- Section on conservation and logic significantly revised with insights from recent research
- New *A Case to Study: Stones in the Belly* illustrates preoperational cognition
- New subsection *Overimitation* expands discussion in previous edition
- New subsection *STEM Learning* looks at Vygotsky’s theory as it applies to the current emphasis on STEM education
- Recent research on the naming explosion and fast-mapping
- *Visualizing Development: Early-Childhood Schooling*

10. Early Childhood: Psychosocial Development

- Section on protective optimism revised
- Introduction to major section *Play* revised and expanded
- Section on *Culture and Cohort* revised and expanded; includes figure showing time spent in various activities by children from four cultures/ethnicities
- Section on drama and pretending revised with new data on how much “screen time” young children have each day
- Section on gender development brought forward
- Section on moral development significantly reorganized and expanded
- *Visualizing Development: Less Play, Less Safe?*

Part IV. Middle Childhood

11. Middle Childhood: Biosocial Development

- *Special Education* now a major section
- New chapter opener highlights questions about parents’ impact on a child’s physical development
- New section on children’s health habits
- New *A View from Science: What Causes Childhood Obesity?*

- New major section *Developmental Psychopathology* is a revised and reorganized treatment of issues around children with special needs, including a revised section on ADHD and drug treatments for children
- New *A Case to Study: Lynda Is Getting Worse* illustrates the difficulty in diagnosing psychopathologies
- New Figure 11.4 shows percentage of 6- to 17-year-olds medicated for emotional or behavioral difficulties during the last six months
- Dysgraphia added to the discussion of specific learning disorders
- New Figure 11.5 shows percentage of 3- to 21-year-olds with special educational needs in 1981, 2001, 2012
- *Visualizing Development: Childhood Obesity Around the Globe*

12. Middle Childhood: Cognitive Development

- Recent research added to the *Information Processing* section detailing how the ability to estimate magnitude (such as understanding the relative size of fractions) predicts later math proficiency
- Section on bilingual education brought forward
- Recent research on academic achievement that shows children have to internalize the positive expectations of teachers and parents for those expectations to motivate learning
- Recent research about the provision (or lack of provision) of arts education
- Section on international testing revised and expanded
- New research on changes in teachers' and state legislators' attitudes toward the Common Core (more negative)
- Second-language learning as an example of how policy affects education
- New section on ethnic diversity in U.S. schools
- *Visualizing Development: Education in Middle Childhood Around the World*

13. Middle Childhood: Psychosocial Development

- Social rejection as a cause and a consequence of feeling inferior
- Revised section on self-concept includes focus on the importance of social comparison
- New section *Culture and Self-Esteem* discusses what healthy self-esteem means in different cultures
- Revised section on two-parent families
- *Visualizing Development: A Wedding, or Not? Family Structures Around the World*

Part V. Adolescence

14. Adolescence: Biosocial Development

- Chapter reorganized: section on growth brought forward under new major heading *Growth and Nutrition*; sections on *Brain Development* and *Sexual Maturation* each now a major heading
- New *A View from Science: Stress and Puberty*
- Section *Body Fat and Chemicals* combines sections *Body Fat* and *Hormones* from previous edition
- Discussion of brain development brought forward
- *Visualizing Development: The Timing of Puberty*

15. Adolescence: Cognitive Development

- Discussion of the imaginary audience revised and updated to include impact of social media
- Three short problems have been added for students to test themselves on intuitive and analytical reasoning



DASHA PETRENKO/SHUTTERSTOCK

Don't Worry Contemporary teenagers, like this couple, are more likely to be seen in public hugging and kissing but are less likely to be sexually active than similar couples were 20 years ago.

- Major section on technology and cognition reorganized and substantially revised under the heading *Digital Natives*
- New section on the dangers of sexting
- *Visualizing Development: Thinking in Adolescence*

16. Adolescence: Psychosocial Development

- Significantly revised introduction to the section on peer pressure
- New section on social networking in discussion of peers
- New *Opposing Perspectives: E-cigarettes: Path to Addiction or Healthy Choice?*
- *Visualizing Development: How Many Adolescents Are in School?*

Epilogue: Emerging Adulthood

- Section on biosocial development substantially revised; now includes discussion of organ reserve, homeostasis, allostasis
- New *A Case to Study: An Adrenaline Junkie*
- Revised and expanded section on current contexts of college
- Revised section *Identity Achieved*

Ongoing Features

Many characteristics of this book have been acclaimed in every edition and continue to shine.

Writing That Communicates the Excitement and Challenge of the Field

An overview of the science of human development should be lively, just as real people are. Each sentence conveys tone as well as content. Chapter-opening vignettes bring student readers into the immediacy of development. Examples and explanations abound, helping students connect theory, research, and their own experiences.

Coverage of Brain Research

Inclusion of the exciting results from neuroscience is a familiar feature of this book. Brain development is the most obvious example: Every chapter includes a section on the brain, often enhanced with charts and photos. The following list highlights some of this material:

- PET scans of brains of a depressed and a non-depressed person, p. 6; illustrated, p. 6
- The three domains of development, p. 7; illustrated, p. 7
- Critical periods of development, p. 16
- Neuroscience and the limits of Piaget's developmental theory, pp. 48–49
- Brain scans of adults with ADHD, pp. 49–50; illustrated, p. 49
- Influence of copy number variations on basic brain structures, p. 84
- Genetic counseling and psychological disorders, pp. 92–93
- Prenatal growth of the brain, pp. 103–104; illustrated, p. 105
- Teratogenic effects on brain development, pp. 113–114; illustrated, p. 114
- Brain development in the first two years, pp. 142–147; illustrated, p. 144; p. 146
- Experience-expectant and experience-dependent brain development, pp. 146–147

- Factors that can harm brain development, pp. 148–151
- Severe social deprivation: the case of Genie, p. 150
- Brain immaturity and cross-modal perception, p. 159
- A View from Science: Piaget and Modern Research*, pp. 177–179
- Techniques of infant brain scans, p. 179, illustrated, p. 178
- Infant cognition: affordances and memory, pp. 181–186
- Brain developments that support social emotions, pp. 204–205
- The effect of the stress hormone cortisol on the developing brain, p. 204
- Genetic influences on temperament, especially the combination of DRD4 VNTR and 5-HTTLPR genes, p. 211
- Brain maturation and synchrony, pp. 213–214
- Attachment and brain development, pp. 215–221; illustrated, p. 215; p. 216
- Brain development in early childhood (prefrontal cortex, myelination, lateralization, the limbic system, stress and the brain), pp. 245–253; illustrated, p. 246 and p. 252
- Abnormal growth of the corpus callosum and ADHD, p. 250
- A View from Science: the effect of lead exposure on brain development*, pp. 258–259
- Consequences of maltreatment on brain development, p. 270
- Maturation of the prefrontal cortex and theory of mind, pp. 287–288
- Cultural differences in executive function among 5-year-olds, pp. 288–290
- The influence of myelination of the limbic system and growth of the prefrontal cortex in development of emotional regulation, pp. 313–314
- Preventing psychopathology by seeking emotional balance, p. 316
- The effects of physical exercise on the brain, p. 353
- Brain development in middle childhood, pp. 356–358
- Neurological advances and selective attention, p. 357
- Brain scans and intelligence, p. 360
- Neurological scans confirm usefulness of information-processing approach, pp. 381–382
- Memory capabilities by age, pp. 382–385
- Development of control processes in middle childhood, pp. 384–385
- Erikson and Freud's insights into middle childhood; cognitive maturation, pp. 410–411
- Brain abnormality as a possible factor in bullying, p. 432
- The role of the pituitary gland in hormone production, pp. 446–447; illustrated, p. 447
- The role of the brain in regulating circadian rhythms, p. 448
- Adolescent brain development; heightened arousal of reward areas of the brain, pp. 462–464
- Proportion of gray matter from childhood through adolescence, illustrated, p. 462
- Benefits of adolescent brain development, pp. 464–465
- Dual processing as a result of brain maturation, pp. 487–488
- Risk taking and brain activity, pp. 487–488; illustrated, p. 488
- Cognitive skills the adolescent mind can develop, p. 505
- Neurological factors as predictors of delinquency in adolescence, p. 530
- Drug use and potential harm to the brain, pp. 534–535
- The impact of alcohol on the adolescent brain, p. 535
- Brain development and hormones as factors in risk taking, pp. 545–546
- Brain development and postformal thought, pp. 548–549
- Brain changes from age 14 to age 25, illustrated p. 549

Coverage of Diversity

Multicultural, international, multiethnic, sexual orientation, wealth, age, gender—all these words and ideas are vital to appreciating how people develop. Research uncovers surprising similarities and notable differences: We have much in common, yet each human is unique. From the discussion of social contexts in Chapter 1 to the coverage of cultural differences in emerging adulthood in the Epilogue, each chapter highlights possibilities and variations.

New research on family structures, immigrants, bilingualism, and ethnic differences in health are among the many topics that illustrate human diversity. Listed here is a smattering of the discussions of culture and diversity in this new edition. Respect for human differences is evident throughout. You will note that examples and research findings from many parts of the world are included, not as add-on highlights but as integral parts of the description of each age.

- Inclusion of all kinds of people in the study of development, pp. 9–15
- Multicontextual considerations in development (SES, cohort, family configuration, etc.), pp. 11–15
- Culture defined; the need to include people of many cultures in developmental study, p. 11
- Race and ethnic group defined and discussed (includes *Opposing Perspectives*), pp. 12–13
- Changes to ethnic make-up of the United States, illustrated, p. 31
- Learning within a culture; cultural transmission, pp. 52–54
- Vygotsky’s sociocultural theory, pp. 52–54
- Humanism and Maslow’s hierarchy, pp. 55–57, illustrated, p. 56
- Developmental theories reflecting historical and cultural influences of their time, pp. 57–61
- Variations in breast-feeding practices around the world, illustrated, p. 63
- Genetic variations among people: alleles, p. 68
- Male and female sex chromosomes, pp. 71–72, illustrated, p. 71
- Opposing Perspectives*: international differences in sex selection, pp. 72–73
- Methods of labor and birth in England, Peru, and the United States, illustrated, p. 106
- Rates of cesarean births in selected countries, pp. 108–109, illustrated, p. 108
- Birthing practices in various cultures, pp. 110–111
- Ethnic differences in the allele that causes low folic acid, p. 115
- A View from Science*: Conflicting advice about teratogens in the United States, United Kingdom, and Canada, pp. 117–118
- Immigrant paradox, p. 123
- Rates of low birthweight in various countries, pp. 123–125, illustrated, p. 124
- Postpartum depression, p. 128
- The father’s role in supporting the mother, pp. 128–129
- Opposing Perspectives*: cultural differences in co-sleeping, pp. 140–141; rates in various countries, p. 140
- Cultural commitment to certain foods and tastes, p. 154
- Cultural variations in the time at which walking occurs, pp. 159–160
- Cultural variations in infant mortality rates, pp. 161–162
- A Case to Study*: cultural variations in SIDS rates, pp. 162–163, illustrated, p. 162
- Breast-feeding and HIV-positive women in Africa, pp. 165–166

Family Unity Thinking about any family—even a happy, wealthy family like this one—makes it apparent that each child’s family experiences differ. For instance, would you expect this 5-year-old boy to be treated the same way as his two older sisters? And how about each child’s feelings toward the parents? Even though the 12-year-olds are twins, one may favor her mother while the other favors her father.



- International rates of stunting, pp. 167–168
- Malnutrition: wasting in developing nations, pp. 167–168
- Cultural and family differences in infants' exposure to language and language use, pp. 190–193
- Understanding of emotional content of English by non-English speakers, p. 196
- Separation anxiety and stranger wariness in Japan and Germany, pp. 205–206
- Cultural differences in emotions encouraged in toddlers, pp. 206–207
- Genetic and gender differences in infant/toddler temperament, p. 211
- Ugandan mothers' contact-maintaining behaviors, p. 217
- Influence of SES on attachment type, p. 219
- Outcomes for Romanian orphans adopted by North American, European, and Australian families, p. 220
- Gender differences in parental styles, pp. 221–223
- Proximal and distal parenting in Cameroon and Greece, p. 226
- International comparisons of infant day-care differences, pp. 230–233
- Parental leave policies in selected countries, pp. 231–232, illustrated, p. 232
- Differences in the corpus callosum between right- and left-handed people, p. 247
- A View from Science*: long-term symptoms of lead poisoning, p. 258
- Chinese cultural views on artistic expression, p. 261
- Culture and injury prevention, pp. 265–266
- Study of overimitation in South Africa, Botswana, and Australia, pp. 283–284
- Culture as a determinant of how one thinks and acts (social learning, Vygotsky), p. 284
- Cultural differences in development of theory of mind, pp. 287–289
- Bilingualism in various nations; ethnicity and bilingualism in the United States, pp. 295–296
- English proficiency among U.S. children whose home language is not English, illustrated p. 295
- Effects of intervention programs on low-SES children, pp. 303–305
- Various cultures' goals for emotional regulation in young children, p. 315
- Cultural differences in young children's play, pp. 319–320
- Children's overexposure to gender and ethnic stereotypes as a result of too much screen time, p. 323
- Cultural differences in caregiving styles, p. 326
- Sex and gender differences, p. 327
- Oedipus and Electra complexes, pp. 328–329
- Influence of cultural norms on children, p. 330
- Cultural differences in child discipline, pp. 337–338
- Opposing Perspectives*: cultural attitudes towards spanking, p. 338
- Rates of childhood obesity around the world, illustrated, p. 352
- A View from Science*: childhood obesity in the United States by ethnicity; genetic propensity toward obesity and diabetes, pp. 353–355
- Common leisure activities; impact on low-SES children, pp. 353–354
- Childhood asthma and ethnicity in the United States, pp. 354–355, illustrated, p. 355
- Cultural considerations in IQ testing, p. 360
- Consideration of children with special needs, pp. 365–373



Not Victims An outsider might worry that these two boys would be bullied, one because he is African American and the other because he appears to be disabled. But both are well liked for the characteristics shown here: friendliness and willingness to help and be helped.

A Case to Study: difficulties in diagnosis of special needs, p. 365
 Cultural differences (Vygotsky) and SES differences in school-age children's learning, pp. 379–381
 Bilingual education, pp. 387–389
 Academic achievement and SES, pp. 389–390
 Parents' and teachers' expectations and academic achievement, pp. 390–391
 Curriculum differences in various countries, pp. 392–395
 Math and reading achievement in various countries, pp. 395–397, illustrated, p. 396
 Gender differences in school performance, pp. 397–398
 Children's second-language proficiency: Europe, Africa, Canada, the United States, p. 400
 Ethnic diversity in U.S. public schools, pp. 403–405, illustrated, p. 403
 Cultural differences in self-esteem in middle childhood, pp. 411–412

Children's reactions to stress in Louisiana (Hurricane Katrina), Sri Lanka (tsunami), and Sierra Leone (war and child soldiers), pp. 414–415
 Family function within various structures, including families headed by same-sex couples, pp. 422–427
 Rates of single parenthood around the world, illustrated, p. 423
 Effects of SES on family structure and function, pp. 427–428
 Shyness and popularity in North America and China, pp. 430–431
 Gender differences in bullying, p. 432
 Efforts to control bullying in various nations, p. 433
 Age-related differences in moral reasoning, pp. 434–435
 Gender differences in children's retribution/restitution behavior, pp. 437–438
 Influence of body fat on onset of puberty (girls), p. 450
 Ethnic differences in onset of puberty, illustrated, p. 451; p. 455
 Gender differences in reaction to early or late puberty, pp. 454–455
 Nutritional deficiencies: U.S. ethnic and international examples, pp. 458–459
 Ethnic differences in teen birth rates (U.S.); differences in other nations, p. 469
 Condom use among teens in various nations, illustrated, p. 471
 Age differences in logical thinking, pp. 476–481
Opposing Perspectives: Testing: comparison of international scores on PISA, p. 502
 Formation of ethnic identity, p. 512
 Formation of gender identity, p. 513
 Cultural differences in adolescents' relationships with adults, pp. 516–517
 Adolescent sexual orientation and same-sex relationships, p. 523, illustrated, p. 524
 Differences in sex education, United States and Europe, pp. 524–526
 Gender, ethnicity, and age differences in self-esteem in adolescence, pp. 526–527
 Genetic and gender differences in risk of depression, pp. 527–528
 Gender differences in rates of teen parasuicide and suicide, pp. 528–529, illustrated, p. 528
 International comparisons: adolescent use of alcohol and cigarettes, pp. 532–533

Differences in teen drug use by age, gender, and generation, pp. 532–535
 The effect of globalization on the spread of infectious diseases, including STIs, p. 546
 Differences in substance abuse, by age, pp. 547–548, illustrated, p. 548
A View from Science: Stereotype Threat, p. 550
 Ethnic diversity in college, illustrated, p. 555

Up-to-Date Coverage

My mentors welcomed curiosity, creativity, and skepticism; as a result, I am eager to read and analyze thousands of articles and books on everything from autism to zygosity. The recent explosion of research in neuroscience and genetics has challenged me, once again, first to understand and then to explain many complex findings and speculative leaps. My students continue to ask questions and share their experiences, always providing new perspectives and concerns.

Topical Organization Within a Chronological Framework

The book's basic organization has endured. Four chapters begin the book with coverage of definitions, theories, genetics, and prenatal development. These chapters provide a developmental foundation and explain the life-span perspective, plasticity, nature and nurture, multicultural awareness, risk analysis, gains and losses, family bonding, and many other basic concepts.

The other four parts correspond to the major periods of development. Each part contains three chapters, one for each of three domains: biosocial, cognitive, and psychosocial. The topical organization within a chronological framework is a useful scaffold for students' understanding of the interplay between age and domain. The chapters are color-coded with tabs on the right-hand margins. The pages of the biosocial chapters have turquoise tabs, the cognitive chapters have blue tabs, and the psychosocial chapters have lime-green tabs.

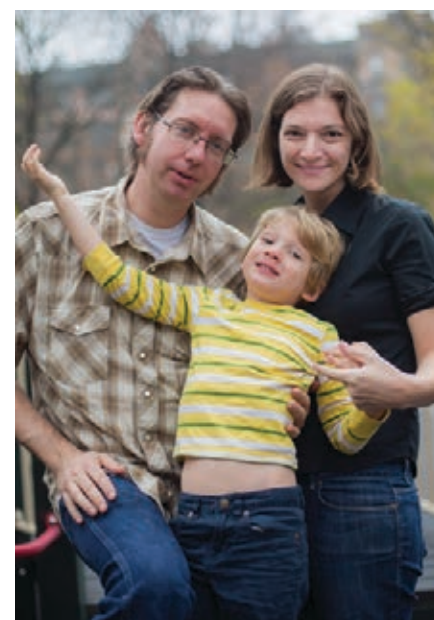
Three Series of Integrated Features

Three series of deeper discussions appear as integral parts of the text where they are relevant. Readers of earlier editions will remember *A Case to Study* and *A View from Science*; new to this edition is the *Opposing Perspectives* feature. It is my belief that these features belong as part of the text, and hence they are placed exactly where they are relevant. I chose not to have separate chapters or boxes on diversity or abnormal development, because these topics are not discrete: They are integral to understanding every child.

End-of-Chapter Summary

Each chapter ends with a summary, a list of key terms (with page numbers indicating where the word is introduced and defined), and three or four application exercises designed to help students apply concepts to everyday life. Key Terms appear in boldface type in the text and are defined in the margins and again in a glossary at the back of the book. The outline on the first page of each chapter, the new learning objectives, and the system of major and minor subheads facilitate the survey-question-read-write-review (SQ3R) approach.

A “Summing Up” feature at the end of each section provides an opportunity for students to pause and reflect on what they've just read. Observation Quizzes inspire readers to look more closely at certain photographs, tables, and figures. The “Especially for . . .” questions in the margins, many of which are new to this edition, apply concepts to real-life careers and social roles.



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Didn't Want to Marry This couple were happily cohabiting and strongly committed to each other but didn't wed until they learned that her health insurance would not cover him unless they were legally married.

Photographs, Tables, and Graphs That Are Integral to the Text

Students learn a great deal from this book's illustrations because Worth Publishers encourages authors to choose the photographs, tables, and graphs and to write captions that extend the content. The Online Data Connections further this process by presenting numerous charts and tables that contain detailed data for further study.

Supplements

After teaching every semester for many years, I know well that supplements can make or break a class. Students are now media savvy and instructors use many new tools. Many supplements are available for both students and professors.



LaunchPad

A comprehensive web resource for teaching and learning, Worth Publishers' online course space offers:

- Prebuilt units for each chapter, curated by experienced educators, with relevant media organized and ready to be assigned or customized to suit your course
- One location for all online resources, including an interactive e-Book, LearningCurve's adaptive quizzing (see below), videos, activities, and more
- Intuitive and useful analytics, with a gradebook that lets you track how students in the class are performing individually and as a whole
- A streamlined and intuitive interface that lets you build an entire course in minutes

The LaunchPad can be previewed at www.macmillanhighered.com/launchpad/bergerca10e

LearningCurve

The **LearningCurve** quizzing system reflects the latest findings from learning and memory research. LearningCurve's adaptive and formative quizzing provides an effective way to get students involved in the coursework. It combines:

- A unique learning path for each student, with quizzes shaped by each individual's correct and incorrect answers
- A personalized study plan, to guide students' preparation for class and for exams
- Feedback for each question with live links to relevant e-Book pages, guiding students to the resources they need to improve their areas of weakness

The LearningCurve system combines adaptive question selection, immediate feedback, and an interactive interface to engage students in a learning experience that is unique to them. Each LearningCurve quiz is fully integrated with other

The screenshot shows the LaunchPad interface for the course 'The Developing Person Through Childhood and Adolescence, 10th Edition' by Kathleen Stassen Berger. The interface includes a navigation menu on the left with icons for eBook, Gradebook, Calendar, Resources, Welcome Center, Instructor Console, and Preview as Student. The main content area displays course information, a notification about assignments due in the next 7 days, a list of assignments with due dates, and a list of unassigned chapters. The footer contains links for LaunchPad, eLearning, Support, and Policies, along with a System Check button.

resources in LaunchPad, so students will be able to review using Worth's extensive library of videos and activities. And state-of-the-art question-analysis reports allow instructors to track the progress of individual students as well as their class as a whole.

A team of dedicated instructors—including Diana Riser, Columbus State University, Carolyn Ensley, Wilfrid Laurier University, Jim Cuellar, Indiana University, Bloomington; Lisa Hager, Spring Hill College; Jessica Herrick, Mesa State College; Sara Lapsley, Simon Fraser University; Rosemary McCullough, Ave Maria University; Wendy Morrison, Montana State University; Emily Newton, University of California, Davis; Curtis Visca, Saddleback College; and Devon Werble, East Los Angeles Community College—have worked closely to develop more than 5,000 quizzing questions developed specifically for this book.

You'll find the following in our LaunchPad:

Human Development Videos

In collaboration with dozens of instructors and researchers, Worth has developed an extensive archive of video clips. This collection covers the full range of the course, from classic experiments (like the Strange Situation and Piaget's conservation tasks) to investigations of children's play to adolescent risk-taking. Instructors can assign these videos to students through LaunchPad or choose one of 50 popular video activities that combine videos with short-answer and multiple-choice questions. For presentation purposes, our videos are available in a variety of formats to suit your needs, and highlights of the series appear periodically in the text's margin.

Instructor's Resources

Now fully integrated with LaunchPad, this collection of resources written by Richard O. Straub (University of Michigan, Dearborn) has been hailed as the richest collection of instructor's resources in developmental psychology. The resources include learning objectives, springboard topics for discussion and debate, handouts for student projects, course-planning suggestions, ideas for term projects, and a guide to audiovisual and online materials.

Interactive Presentation Slides

A new, extraordinary series of “next-generation” interactive presentation lectures gives instructors a dynamic yet easy-to-use new way to engage students during classroom presentations of core developmental psychology topics. Each lecture provides opportunities for discussion and interaction and enlivens the psychology classroom with an unprecedented number of embedded video clips and animations from Worth's library of videos. In addition to these animated presentations, Worth also offers a set of prebuilt slide sets with all chapter art and illustrations. These slides can be used as is, or they can be customized to fit individual needs.

Test Bank and Computerized Test Bank

The test bank, prepared by Jillene Seiver (Bellevue College) includes at least 100 multiple-choice and 70 fill-in-the-blank, true-false, and essay questions for each chapter. Good test questions are critical to every course, and we have gone through each and every one of these test questions with care. We have added more challenging questions, and questions are keyed to the textbook by topic, page number, and level of difficulty. Questions are also organized by NCLEX, NAEYC, and APA goals and Bloom's taxonomy. We have also written rubrics for grading all of the short-answer and essay questions in the test bank.

The Diploma computerized test bank guides instructors step by step through the process of creating a test. It also allows them to quickly add an unlimited number of questions; edit, scramble, or resequence items; format a test; and include pictures, equations, and media links. The accompanying gradebook enables instructors to record students' grades throughout the course and includes the capacity to sort student records, view detailed analyses of test items, curve tests, generate reports, and add weights to grades.

Thanks

I'd like to thank the academic reviewers who have read this book in every edition and who have provided suggestions, criticisms, references, and encouragement. They have all made this a better book. I want to mention especially those who have reviewed this edition:

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A handwritten signature in black ink that reads "Kathie Stassen Berger". The signature is written in a cursive, flowing style.

New York, January 2015

Dedication

Finally, I wish to dedicate this edition to my brother, Glen Harold Stassen, a dedicated professor and author, as well as my beloved only sibling. My plan was to reach old age with him, but he died in 2014.



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RIGHT: LANE OATEY/GETTY IMAGES

the beginnings

The science of human development includes many beginnings. Each of the first four chapters of this text forms one corner of a solid foundation for our study.

Chapter 1 introduces definitions and dimensions, explaining research strategies and methods that help us understand how people develop. The need for science, the power of culture, and the necessity of an ecological approach are all explained.

Without ideas, our study would be only a jumble of observations. Chapter 2 provides organizing guideposts: Five major theories, each leading to many other theories and hypotheses, are described.

Chapter 3 explains heredity. Genes never act alone, yet no development—whether in body or brain, at any time, in anyone—is unaffected by DNA.

Chapter 4 details the prenatal growth of each developing person from a single cell to a breathing, grasping, crying newborn. Many circumstances—from the mother's diet to the father's care to the culture's values—affect development every day of embryonic and fetal growth.

As you see, the science and the wonder of human life begin long before the first breath. Understanding the beginnings described in each of these chapters prepares us to understand each developing child, and each of us.





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RIGHT: LANE OATEY/GETTY IMAGES

CHAPTER 1

Introduction



What Will You Know?*

1. How can the study of children, each one unique, be a science?
2. Does his or her ethnic group make any difference in a child's development?
3. Is childhood today different from childhood fifty years ago?
4. How can we know what changes between one year of life and the next?
5. Do scientists always investigate the crucial questions?

At 6:11 A.M. I am holding my daughter's bent right leg in place with all my strength. A nurse holds her left leg while the midwife commands, "Push . . . push . . . push." Finally, a head is visible, small and wet, but perfect. In a moment, body and limbs emerge—all 4,139 grams of Caleb, perfect as well. Every number on the monitor is good, and my new grandson breathes and moves as a healthy newborn should. Bethany, smiling, begins to nurse.

This miracle makes celestial music ring in my ears. The ringing grows louder. Bethany shimmers, then the room grows dark. Suddenly, I am on the floor, looking up at six medical professionals: I have fainted.

"I am fine," I insist, scrambling back onto the couch where I spent the night. Six people stare down at me.

"You need to go to triage," one says.

"No, I am fine. Sorry I fainted."

"We must send you to triage, in a wheelchair."

What can I say to make them ignore me and focus on Bethany and Caleb?

"You can refuse treatment," a nurse tells me.

Oh yes, thank you, the law now requires patient consent.

I am wheeled down to Admitting; I explain that I was with my laboring daughter all night with no food or sleep. I refuse treatment.

The admitting nurse takes my blood pressure—normal—and checks with her supervisor. She lets me return before the placenta is delivered.

I am thankful, but puzzled. As a developmental scholar and author, I understand birth, numbers, jargon, monitors, body language, medical competence, hospital cleanliness, hall noises, and more. I do not panic. I knew that Bethany was strong and

- **Understanding How and Why**
The Need for Science
The Nature–Nurture Controversy
The Three Domains
Childhood and Adulthood
- **Including All Kinds of People**
Difference or Deficit?
Culture, Ethnicity, and Race
OPPOSING PERSPECTIVES: Using the Word *Race*
Socioeconomic Status
Finding the Balance
- **As Time Goes On**
Critical Periods
Ecological Systems
Plasticity
A CASE TO STUDY: Plasticity and David
- **Using the Scientific Method**
Observation
The Experiment
The Survey
Studying Development over the Life Span
- **Cautions and Challenges from Science**
Correlation and Causation
A VIEW FROM SCIENCE: Vaccination and Autism
Ethics
Science as a Way to Help Humankind

*"What will you know?" questions start each chapter, one question for each major heading. These questions are intended to highlight provocative, memorable issues within the chapter. More specific questions ("What have you learned?") follow each section summary.



COURTESY KATHLEEN BERGER

Born Blissful One of us rests after an arduous journey, and the other rejoices after crying and fainting.

science of human development The science that seeks to understand how and why people of all ages and circumstances change or remain the same over time.

healthy, and every prenatal visit confirmed a healthy fetus. I was grateful, but not surprised, that all was well.

I told the triage nurse that I had not slept or eaten all night—true, but I had done that before, never fainting. Why this time?

This incident is a fitting introduction for Chapter 1, which begins to explain what we know, what we don't know, and how we learn about human development. For me and other scientists, and also for you and everyone else, unexpected moments occur as each life is lived. Emotions mix with intellect, family bonds with professional competence, contexts with cultures, personal experiences with academic knowledge, generalities with exceptions.

Many details of Caleb's arrival were unlike birth in other cultures and eras. Yet other aspects have always been part of the human experience. This chapter, and those that follow, will help you understand the specifics and the universals of development.

Understanding How and Why

The **science of human development** seeks to understand how and why people—all kinds of people, everywhere, of every age—change over time. The goal of this science is to help Earth's 7 billion people fulfill their potential.

Each aspect of this definition above merits explanation.

The Need for Science

Developmental study is a *science*. It depends on theories, data, analysis, critical thinking, and sound methodology, just like every other science. All scientists ask questions and seek answers in order to ascertain “how and why.” In this process, scientists gather evidence on whatever they are studying, be it chemical elements, rays of light, or, here, child behavior.

One hallmark of the science of human development is that it is interdisciplinary; that is, scientists from many academic disciplines (biology, psychology, sociology, anthropology, economics, and history among them) contribute to our understanding of how and why people grow.

Science is especially useful when we study children: Lives depend on it. What should pregnant women eat and drink? How much should babies cry? When and how should children be punished? What should 5-year-olds learn? Should they learn in school or at home? Through required memorization or free play? About God or about algebra?

People have disagreed about almost every question in child development—often vehemently, sometimes violently. Some parents beat their children; others imprison such parents. Some parents sacrifice vast sums to send their children to schools that others abhor. Science informs, guides, and redirects those on all sides of every dispute.

The Scientific Method

To discard unexamined opinions and to rein in personal biases, we follow the five steps of the **scientific method** (see Figure 1.1):

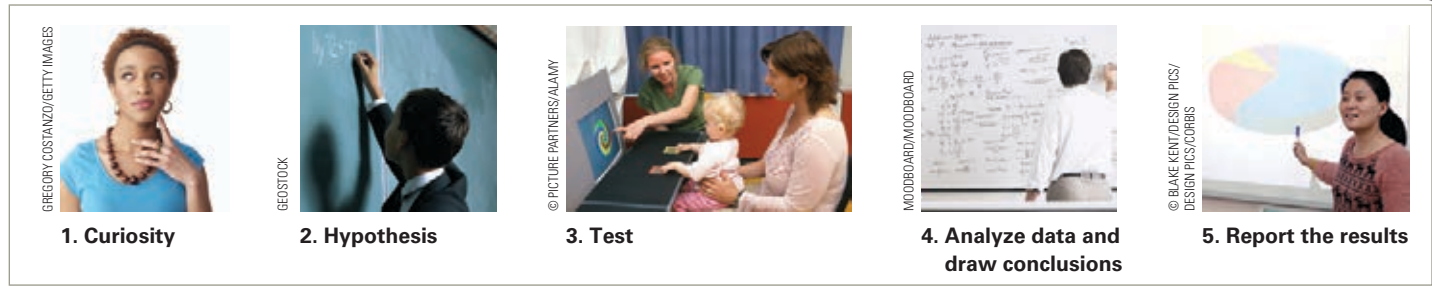
1. *Begin with curiosity.* On the basis of **theory**, prior research, or personal observation, pose a question.
2. *Develop a hypothesis.* Shape the question into a **hypothesis**, a specific prediction to be examined.
3. *Test the hypothesis.* Design and conduct research to gather **empirical** evidence (data).

scientific method A way to answer questions using empirical research and data-based conclusions.

theory A comprehensive set of ideas.

hypothesis A specific prediction that can be tested.

empirical Based on observation, experience, or experiment; not theoretical.



4. *Analyze data and draw conclusions.* Determine whether the evidence supports the hypothesis.
5. *Report the results.* Share the data, procedures, statistics, conclusions, and alternative explanations.

FIGURE 1.1

Process, Not Proof Built into the scientific method—in questions, hypotheses, tests, and replication—is a passion for possibilities, especially unexpected ones.

The Need for Replication

As you see, scientists begin with curiosity and then seek the facts, drawing conclusions only after careful research. **Replication**—repeating the procedures and methods of a study with different participants—may be a final step (Jasny et al., 2011). Scientists learn from each other, building on what has gone before. They hesitate to draw conclusions or to believe the results of others' research until replication has occurred—although often the media broadcast surprising findings before replication.

This method is not foolproof. Scientists sometimes draw conclusions too quickly, misinterpret data, or ignore alternative perspectives, as discussed at the end of this chapter. Something that is valid for one group of children in one time and place may not be valid elsewhere or in another time. Scientists continually refine methods, question the conclusions drawn by others, and occasionally discover—to their shock and horror—that another scientist has not followed the procedures outlined above. Replication is needed to verify conclusions.

Always, however, asking questions and testing hypotheses by gathering data is the foundation of science; always, scientists seek facts, not untested assumptions.

replication Repeating a study, usually using different participants.

The Nature–Nurture Controversy

A great puzzle of development—the *nature–nurture debate*—is an easy example of the need for science. **Nature** refers to the influence of the genes that people inherit. **Nurture** refers to environmental influences, which begin with the health and diet of the embryo's mother and continue lifelong, including the impacts of family, school, community, and culture.

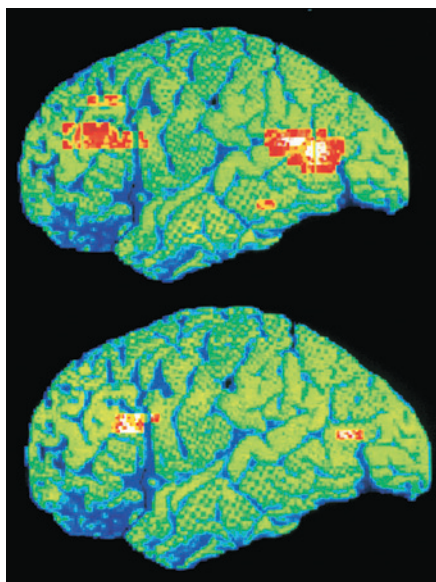
The nature–nurture debate has many other names, among them *heredity–environment* and *maturational–learning*. Under whatever name, the basic question is: *How much of any characteristic, behavior, or emotion is the result of genes, and how much is the result of experience?*

Some people believe that most traits are inborn, that children are innately good (“an innocent child”) or bad (“beat the devil out of them”). Others stress nurture, crediting or blaming parents, neighborhoods, drugs, or even food when someone is good or bad, a hero or a criminal.

Neither belief is accurate. The question is “how much,” not “which,” because both genes and the environment affect every characteristic: Nature always affects nurture, and then nurture affects nature. Even “how much” is misleading if it implies that nature and nurture each contribute a fixed amount (Eagly & Wood, 2013; Lock, 2013).

nature In development, nature refers to the traits, capacities, and limitations that each individual inherits genetically from his or her parents at the moment of conception.

nurture In development, nurture includes all the environmental influences that affect the individual after conception. This includes everything from the mother's nutrition while pregnant to the implicit values of the nation.



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Red Means Stop At top, the red areas on this PET scan show abnormally low metabolic activity and blood flow in a depressed person's brain, in contrast to the normal brain at bottom. Neuroscience confirms that depression is biological, not just psychological.

differential susceptibility The idea that people vary in how sensitive they are to particular experiences. Often such differences are genetic, which makes some people affected “for better *and* for worse” by life events. (Also called *differential sensitivity*.)

A complex nature–nurture interaction is apparent in every moment of our lives, as is evident in the opening vignette of this chapter. I fainted at Caleb's birth because of at least ten factors (age, air quality, exhaustion, exertion, gender, hormones, joy, low blood sugar, memory, relief), each influenced by both nature and nurture. The combination, and no single factor, landed me on the floor.

Some People Are Vulnerable

Each aspect of nature and nurture depends on other aspects of nature and nurture, in ways that vary for each individual (Manuck & McCaffery, 2014). For instance, the negative impact of a beating, or of any other experience, might be magnified because of the particular versions of genes that a person has. The opposite is true as well: Some genes are protective, making people less vulnerable to difficult or traumatic experiences. Similarly, differences in nurture can either protect against or worsen the impact of a person's genetic make-up.

For example, some people inherit genes (nature) for diabetes but never get that disease because nurture (in this case, diet and exercise) protects them. Or a person could be overweight and sedentary (both risk factors for diabetes and many other ailments) but never become diabetic because their genes buffer the effects of their habits.

Sometimes protective factors, in either nature or nurture, outweigh liabilities. As one review explains, “there are, indeed, individuals whose genetics indicate exceptionally high risk of disease, yet they never show any signs of the disorder” (Friend & Schadt, 2014, p. 970).

This is called **differential susceptibility** (or differential sensitivity)—that is, how sensitive a person is to any particular environmental experience differs from one person to another because of the particular genes each person has inherited. Some people are like dandelions—hardy, growing and thriving in good soil or bad, with or without ample sun and rain. Other people are like orchids—quite wonderful, but only when ideal growing conditions are met (Ellis & Boyce, 2008; Laurent, 2014).

For example, in one study, depression in pregnant women was assessed and then the emotional maturity of their children was measured. Those children who had a particular version of the serotonin transporter gene (5-HTTLPR) were likely to be emotionally immature if their mothers had been depressed, but *more* mature than average if their mothers had not been depressed (Babineau et al., 2014).

The Baby with Colic

An example of differential susceptibility comes from the 10 to 20 percent of all infants who cry for hours at a time in the first 3 months of life, presumably as a result of genes. They are said to have colic, and their frustrated parents cannot comfort them (J.S. Kim, 2011).

A colicky baby is like an orchid, and future development depends on nurture. For some, their inconsolable crying makes the parents unusually responsive. Then the children become better than average (more outgoing, generous, high-achieving) when they outgrow their early difficulties. Other naturally difficult orchids provoke parental anger, or even rejection, the effects of which last long after the colic has subsided. They become low-achieving, unhappy children.

One study of colicky babies confirms that parents react in many ways (Landgren et al., 2012). One mother said:

There were moments . . . when she was apoplectic and howling so much that I almost got this thought, ‘now I’ll take a pillow and put it over her face just until she quietens down, until the screaming stops.’



By contrast, another mother said:

In some way, it made me stronger, and made my relationship with my son stronger. . . . Because I felt that he had no one else but me. 'If I can't manage, no one can.' So I had to cope.

As two developmental experts explain:

Differential susceptibility implies . . . that it may be mistaken to regard some children—like highly negative infants—as simply more vulnerable to the negative effects of adversity. And this is because such children may also benefit more than others from environmental support and enrichment.

[Belsky & Pluess, 2012, p. 3]

These experts find that genetic vulnerability (in this case, the DRD4 gene) does not disappear. During adolescence even well-nurtured orchids are more rebellious and impulsive than the less temperamental dandelions, but nurture always affects nature.

The specifics of differential susceptibility require complex and extensive empirical data, as thousands of scientists seek to understand exactly how nature and nurture interact to produce each particular human trait with each version of each gene. But the simple conclusion remains: Neither genes nor upbringing alone make a child amazingly good or incredibly bad (Masten, 2014). Both nature and nurture matter.

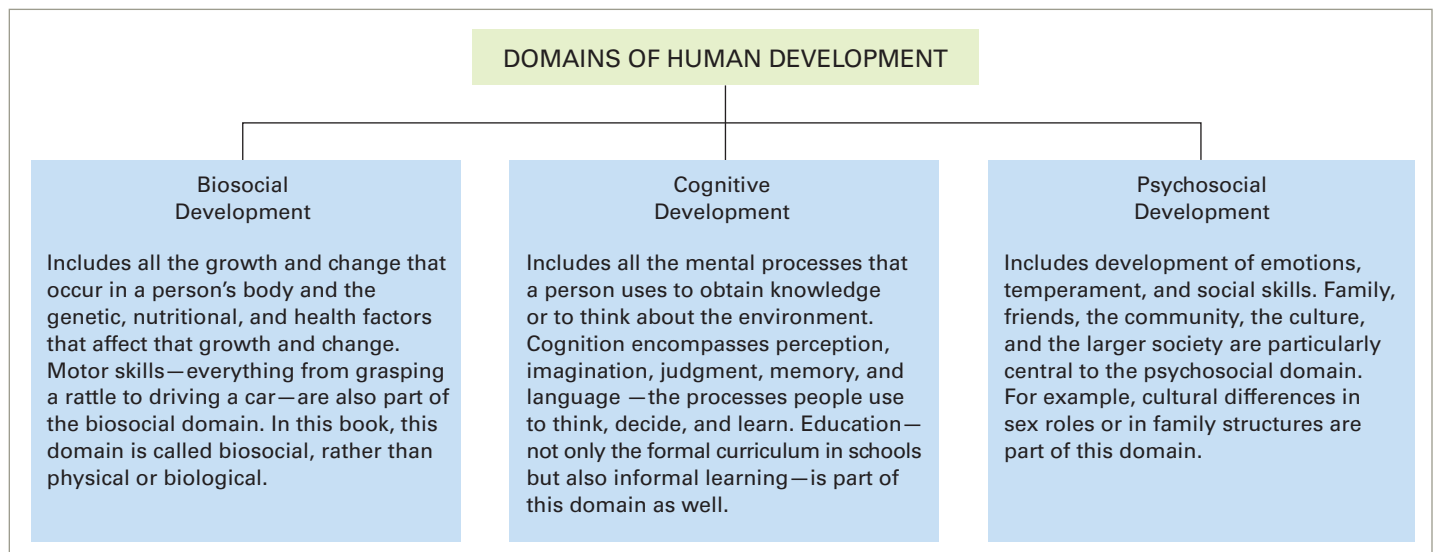
The Three Domains

Obviously, it is impossible to examine nature and nurture on every aspect of human development at once. Typically therefore, individual scientists study one characteristic at a time. A century ago, physical development (such as tooth eruption or running speed) was the main focus of developmental research, but scientists now realize that not only the body but also the intellect and emotions develop throughout life. To understand the whole person, an interdisciplinary approach to human development has replaced the old silo approach of the past.

To make it easier to study, development is often considered in three domains—*biosocial*, *cognitive*, and *psychosocial*. (Figure 1.2 describes each domain.) Each domain includes several academic disciplines: The biosocial includes biology,

FIGURE 1.2

The Three Domains The division of human development into three domains makes it easier to study, but remember that very few factors belong exclusively to one domain or another. Development is not piecemeal but holistic: Each aspect of development is related to all three domains.



neuroscience, and medicine; the cognitive includes psychology, linguistics, and education; and the psychosocial includes economics, sociology, and history. Typically, each scholar follows a particular thread within one domain, using clues and conclusions from other scientists who have concentrated on that same thread.

However, since every person is a whole tapestry of multi-colored threads, every aspect of growth is biopsychosocial, touching on all three domains. For example, babies start speaking because of maturation of the brain, mouth, and vocal cords (*biological*), which allows them to express connections between objects and words (*cognitive*), which could not occur unless people talked to them (*psychosocial*).

This constant interaction of domains presents a problem: Words and pages follow in sequence and the mind thinks one thought at a time. That makes it impossible to describe or grasp all domains simultaneously. The scientific method weaves disparate threads together, as evidence-based conclusions from many sources advance our understanding of the whole person.

Childhood and Adulthood

Are children more important than adults? For decades, because the focus of developmentalists was on physical growth, the answer to this question was yes. Consequently, the study of human development was the study of child development, with a nod to the physical declines of old age. That produced, as a famous critic described, “a curiously broken trajectory of knowledge . . . [with] a brave beginning, a sad ending, and an empty middle (Bronfenbrenner, 1977, p. 525).

Since people were not thought to develop over the years of adulthood, developmentalists did not study adults. The opposing giants of developmental theory, Sigmund Freud and Jean Piaget, agreed on one thing: The final stage of development began in early adolescence and then continued without significant change until death.

Recently, however, that empty middle has been filled. Scientists now gather data about adulthood, discovering many developmental changes. For example, sexual appetites, cognitive perspectives, and employment attitudes all change markedly from ages 15 to 65.

No one now thinks that development stops at age 15. Although many scholars still focus on one part of the lifespan, every developmentalist considers what happened before, and what will happen after, each particular period. For instance, one influential scholar believes infancy is “the foundation and catalyst of human development” (Bornstein, 2014, p. 121). In other words, he studies infancy to understand the rest of life.

Is childhood more important, influential, and determinative than adulthood? If a person is, say, malnourished from age 30 to 33, is that as harmful as if that same person had been malnourished from birth to age 3? The answer to that specific question is no. Neuroscientists have proven that early malnutrition can stunt brain growth and have long-lasting effects far worse than those of later malnutrition.

But scientists are not certain about the cognitive and psychosocial domains. If you had to choose only one developmental period in which to invest billions of education dollars, should you choose preschools or colleges? Or if you were a psychologist who wanted to treat people who would benefit most, would they be children or adults?

The answer is not obvious. Some research suggests that the first years of life are the most crucial for intellectual or emotional development, but other research finds the opposite: Educating parents, or even grandparents, may be the best way to help children. Some researchers find that the adolescent years are more pivotal for later development than those of early childhood (Falconi et al., 2014).



Political debates need solid data. Should the U.S. Congress protect fetuses and infants (e.g., WIC, mother/infant food supplements), or preschoolers (e.g. Head Start), or older children (e.g., public schools), or emerging adults (e.g., college subsidies), or employees (e.g., raising the minimum wage) or seniors (e.g., Social Security and Medicare)?

All of these age groups need help, but government programs are expensive. If we knew that a particular investment in one age group would have greater impact overall than the same money invested at another age, that would guide policy. But developmentalists disagree, even on who needs financial support most, much more on who most needs education, or family support. More science is needed. This leads us to the second phase of our definition.

SUMMING UP The scientific study of human development follows five steps: curiosity, hypothesis, data collection, conclusions, and reporting. Scientists build on prior studies, examining procedures and replicating results—thus confirming or refuting conclusions. This research method is designed to avoid wishful thinking, untested assumptions, and prejudice.

For instance, scientists no longer assume that development is either totally genetic or totally environmental. Instead, nature and nurture always interact, with variations between one person and another, as highlighted by differential susceptibility. Colic is one example.

The scientific method is followed within many disciplines and in all three domains—biosocial, cognitive, and psychosocial. Although each researcher typically concentrates on one aspect of development in one domain, no one stays in their own silo because science connects everyone's data and conclusions.

Once developmental scientists focused almost exclusively on children. Then adult development was recognized. Now researchers seek to understand which interventions at what ages are most effective for optimal development.

WHAT HAVE YOU LEARNED?

1. What makes the study of human development a science?
2. Why is replication sometimes considered an essential follow-up to the five steps of the scientific method?
3. Why is it a mistake to ask whether a human behavior stems from nature or nurture?
4. Why are some children more affected by their environment than others?
5. What is the difference between each of the three domains—biosocial, cognitive, and psychosocial?
6. Why do some people believe that the years of childhood are more crucial for development than the years of adulthood? ●

Including All Kinds of People

Developmentalists study everyone—young and old, rich and poor, of every ethnicity, background, sexual orientation, culture, and nation.

Difference or Deficit?

One reason to study people of all kinds is to combat the human inclination to think that anyone who is different is also deficient, i.e., lacking in something that is important for a good life. We are amused when young girls say, “Boys stink,” or their male classmates say, “Girls are stupid,” but adults have the same tendency: to judge people unlike themselves as inferior.