EDITION 3

The World of Children

Joan Littlefield Cook

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MyPsychLab®

The World of Children

THIRD EDITION

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PEARSON

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To our children: Will, Rachel, Lily, and Andy.
They enrich our lives and remind us that the most important thing in life is the development of children.

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PREFACE

Our students often ask us at the beginning of the term why they should study child development and how it will be useful in their lives. As child development instructors for more than 25 years, we have tried our best to follow the example of great teachers who have come before us. We believe that *how* you teach is as important as *what* you teach. We teach to our students' interests and needs, and we resist the temptation to cover everything we *could* cover, and instead treat what we do cover in a scientific and intellectually honest way. How do we decide what to cover and what can be left out? We start by asking how much impact the material is likely to have on the lives of our students, whether they become parents, teachers, nurses, social workers, or child development researchers themselves. We then make sure that we cover both the current science and applications of the material to ensure that students have an accurate view of where the field is today.

As researchers and university professors we have witnessed exciting changes in the field of child development. From new research on brain development to behavior genetics to new theories of the intricacies of social interactions, developments in this area of psychology continue to provide great insights, challenges, and debates. We are continually inspired by the impact the field of child development has on real lives. Every day, health-care professionals, educators, social workers, day care workers, parents, and, yes, psychologists rely upon developmental science research to perform their professional and personal duties, as they nurture, educate, and otherwise care for the children in their lives. It is this connection between the science and **real people facing real issues** that that we try to convey to our students and to the reader of this textbook.

Our mission in writing this textbook was to ensure we answered the "why" and "how" clearly throughout. We also believe strongly in learning outcomes and in applying principles of educational psychology, learning, and cognitive science to help our students get more out of the course. After all, if we want them to leave the course with a strong appreciation of how developmental science can be a force for positive change in people's lives, we must ensure that they are truly learning, not merely memorizing, the concepts presented in this course. It is increasingly important that students are able to thoughtfully reflect on, critically evaluate, and make practical use of the information they are learning. We consistently prompt students to evaluate and apply the concepts they are learning so they can more effectively use the information in their careers and in their daily lives. Most of our text focuses on contemporary science and on what is happening in the field today—but in order to understand the present, we must reflect on the past. Included in the text are both the classic studies within their historical context and an overview of how these studies have influenced, and continue to influence, how psychologists think about the field of child development. This review helps explain how particular scientific approaches emerged or were adapted or rejected over time. We want to remind students that just as adults are influenced by childhood experiences, the science of child development has been shaped by its past.

Goals of the Text

The World of Children adopts three important goals for the text and the user:

Focus on real people facing real issues;
Teach students to think critically about the research;
Help students make connections between science and practice.

Every feature in our text is thoughtfully designed as part of an integrated system to support active learning, and we hope you will agree that our textbook satisfies these goals.

GOAL 1 Focus on Real People Facing Real Issues

We want students to see an important purpose in studying child development. We are convinced that the science of child development can be very useful in helping real families and real children, and we want students to think about the research in the context of the real issues real families face. To that end, every chapter begins with a case about a real family or a child who is in a situation where more knowledge of child development can be helpful. Supporting the chapter opening cases are video interviews with these same families in MyPsychLab (www.mypsychlab.com). These real cases encourage students to take what they are learning in each chapter and apply it to creating advice for the profiled individuals.

GOAL 2 Teach Students to Think Critically about the Research

We want students to learn new facts and information, but more important, we want students to understand how these new facts and information are generated in our field and to develop skills to evaluate and analyze this information. Throughout the textbook, we take opportunities to show students how research methods work in our field, and we remind them of the important limitations in the methods. The chapter opening cases and the *Think About . . .* questions that appear throughout the chapter are designed to jumpstart the critical thinking process by putting students in the shoes of others and asking them to think about how the research might apply to those individuals' situations. Throughout the chapter we use *Thinking Critically* questions in the margins to provoke deeper, more analytical reflection on the content of the chapter.

The learning objectives at the beginning of each section and brief review quizzes at the end of each section encourage students to think about the material more thoroughly. In this edition, the learning objectives and review quizzes have been categorized by cognitive level (*Know, Understand, Apply, Think Critically*). As instructors, one challenge we frequently face is helping students realize that simply recognizing or being able to restate information in their own words is only one level of learning, and that deep understanding requires that they critically analyze information, apply it to realistic problems, and integrate across concepts to build the "bigger picture." Providing specific learning objectives that are clearly labeled at different levels, supported by margin notes prompting application and critical thinking, help students think about the material at multiple levels.

GOAL 3 Help Students Make Connections between Science and Practice

The field of child development has much to offer students and society in terms of practical advice for parents and professionals as well as guidance on social policy issues, and this advice is based on a solid foundation of research.

Exploring Different Perspectives

Professional Perspective

In each **Professional Perspective** box, a real professional discusses how he or she uses child development information. Using an interview format, each of these features introduces students to a different career; by

the end of the book, students have explored 15 different career paths (among them social work, genetic counseling, clinical and counseling psychology, school psychology, and marketing) that involve work with children, adolescents, and development.

Personal Perspective

Also presented as an interview, **Personal Perspective** boxes allow students to connect with the personal feelings of an actual parent, child, or adolescent who is experiencing an issue discussed in the chapter. This feature allows students to see how real people of all backgrounds relate to child development issues.

Social Policy Perspective

We designed **Social Policy Perspective** boxes to give students an understanding of how work in the field of child development can inform government officials, community service agencies, and others who have wide-ranging effects on the lives of children. This feature focuses on many of the controversial issues in society, examining the perspectives of both sides of each debate. It highlights the ways in which programs, laws, regulations, and other factors can affect children and asks students to think about the impact of social policies.

Taken together, these different *perspective* features help students see how child development information is useful in a wide variety of professional, personal, and social situations. They also help students understand the real-life challenges faced bprofessionals, parents, volunteers, and policy makers whose work relates to the field of child development.

Changes Made to the Third Edition

In addition to the new features mentioned previously, we are pleased to list the following chapter-by-chapter changes made to this edition:

Chapter 1:

Added discussion of the biopsychosocial approach to understanding development.
Added info on connectomics, a new technology to visualize all the neural connections within an intact brain.
Updated the recurring themes (repeated throughout the text) of nature and nurture, the role of neuroscience, diversity and multiculturalism, and positive development and resilience
Updated the "Revisiting Themes" section at the end of the chapter—this section will occur at the end of every chapter to review connections for that chapter to the recurring themes.
Updated example of experimental study to describe influence of a reading intervention on children's reading skills.
Updated statistics in **Social Policy Perspective** box: Every Day in America.

Chapter 2:

Included separate section on how twins are formed, including formation of half-identical twins.
Clarified description of dominant and recessive gene diseases.
Added concepts of polygenic inheritance patterns and of pleiotropic genes.
Added information on maternal blood analysis approach to prenatal testing.
Added information about three-dimensional ultrasonography.
Updated data in Table 2.4 on heritabilities.
Added key term *polygenic traits.*

Chapter 3:

Updated data on survival rates for very preterm and preterm infants.
Added discussion of direct vs. indirect effects of teratogens and the fetal origins of adult disease concept.
Updated information on the statistics and use of alcohol, cocaine, cigarette smoking, and other teratogens during pregnancy.
Added discussion of fetal alcohol spectrum disorder.
Added research on amount of alcohol that can be harmful (small amounts cause brain damage) and neuroscience findings regarding long-term effects of prenatal cocaine exposure.
Updated statistics on prenatal exposure to infectious diseases herpes, syphilis, and AIDS/HIV.
Updated statistics on rate of regular and binge drinking by women and men in the United States, relating this to the question of responsibility for healthy pregnancies.
Added section on Cesarean section delivery, including rates, reasons for it, and potential complications.

Chapter 4:

Reordered subsections in *Growth of Brain and Body* section to improve flow of text.
Updated statistics on infant prematurity and mortality.
Added definition of intrauterine growth restriction, sometimes called small for gestational age, and long-term problems associated with this condition.
Updated statistics on percentage of women receiving prenatal care early in pregnancy.
Updated statistics on the "back to sleep" campaign to reduce SIDS.
Updated statistics on rates of breastfeeding worldwide.
Updated information on perception of smell and taste.
Added key term *intrauterine growth restriction.*

Chapter 5:

Updated research on infant perception of faces.
Added information on neuroscience use of fetal magnetoencephalography (fMEG) to assess fetal habituation.
Updated neuroscience research comparing adult and infant patterns of brain activation in object permanence tasks.
Added concept of embodied cognition.
Updated research on nonhuman use of language, and on criticisms of nativist theory of language development.
Added neuroscience research on infant response to child-directed speech.
Updated information on language skills of newborn infants.

Chapter 6:

Added information about the attachment Q-sort (AQS) method.
Updated cross-cultural results on caregiver sensitivity as related to attachment.
Added mention of the interaction between genetic susceptibility and caregiving in the development of attachment.
Added discussion of assessing father–infant attachment.
Updated longitudinal research on attachment, including a discussion of secure attachment as a protective factor for children with genetic risks.

Updated information on parental leave policies.
Added discussion of relation between temperament and prenatal exposure to stress.
Updated neuroscience studies on emotion processing in infancy.
Updated research on young children's sensitivity to other children's reactions to toys.
Updated research on infants' recognition of conflict and social dominance.

Chapter 7:

Updated statistics on malnutrition in the United States and worldwide.
Updated information on childhood activity levels in several countries, along with suggestions for increasing children's physical activity in school settings.
Updated statistics on childhood deaths and child maltreatment.
Updated information on neural effects of stress.

Chapter 8:

Updated sections on the following:
- development of attention
- development of theory of mind
- bilingual children's skills in attention
- early childhood education, including addition of Chicago Longitudinal Study and updated research on long-term effects of early childhood education programs

Added key term *Chicago Longitudinal Study*.

Chapter 9:

Updated neuroscience research on the following:
- genetic involvement and brain activation related to self-concepts and self-esteem
- neural processing related to self-regulation, including Von Economo neurons
- processing of emotions

Updated research on cross-cultural views of discipline.

Chapter 10:

Updated statistics on the percentages of children who are overweight, including ethnic differences, and percentage of children with abnormal levels of cholesterol or triglycerides.
New figure showing rise-and-fall pattern of brain development in different brain areas.
Updated statistics on physical activity levels of children and school requirements for physical education.
Updated information on sports-related injuries, including concussions.
Updated statistics on childhood injuries.
New neuroscience research on the effects of timing of child abuse on brain development and brain functioning.
Updated information on genetic contribution to ADHD, communication disorders, and learning disorders.
Research on brain activity in children with communication or learning disorders.
Updated information on Autism Spectrum Disorders, including prevalence rates, genetic contribution, and patterns of brain development and activation.

Chapter 11:

Updated information on the following:
- limitations of WM capacity and the episodic buffer
- reconstructed memory and emotion
- the expertise reversal effect in solving problems
- theory and probabilistic learning
- neural processes in reading

Chapter 12:

Added information on patterns of brain activity related to depression.
Added new section on bullying, including types such as cyber bullying, characteristics of bullies and victims, outcomes, and intervention strategies.
Updated information on family structures, including divorce, never married, and stepfamilies
Updated statistics on children's use of media.
Added key term *bullying*.

Chapter 13:

Updated information on brain development and risk-taking behavior.
Updated statistics on patterns of the following:
- adolescent sexual activity
- contraceptive use
- STDs
- teen pregnancy
- teen nutrition and exercise
- teen substance use, including binge drinking
- teen motor vehicle accident rate in relation to graduated driver licensing laws

Updated research on patterns of brain activation and eating disorders.

Chapter 14:

Condensed section on intelligence testing.
Added section on curriculum-based assessment and curriculum-based measurement, and responsiveness to instruction approaches to school-based assessment.
Added Native American English to section on linguistic dialects.

Chapter 15:

Updated statistics on the following:
- bullying of sexual minority youth
- leisure time activities, including time spend text messaging
- academic achievement differences (international, ethnic)
- poverty (overall, urban vs. rural)

Added discussion of youth involvement in gangs.

Our Own Personal Perspective

In addition to our training and research in child development, we call on our practical experience from raising our own four children. As this book is going to press, our oldest son, Andy, is 22 and is completing a bachelor's degree. He is a psychology and sociology double major and works as a therapist for children with autism. Our second son, Will, is 18. He loves sports, excels in most school topics, and is active in many school and community activities. He's a senior in high school, busy with college and scholarship applications and looking forward to a college major in some aspect of health and/or computer sciences. Our twin daughters, Rachel and Lily, are 17. They are fraternal twins and couldn't be more different from each other. Rachel is quiet and shy at first, very coordinated and graceful in athletic activities, and enjoys running cross-country and track. Rachel volunteers at our local Humane Society and is interested in becoming a veterinarian. Lily is more rambunctious and outgoing, and she is the first one to volunteer for a new challenge or experience. She is an avid swimmer, coordinates the Spanish tutoring program at her school, and enjoys math and chemistry. Our girls are best friends in many ways, but they are also learning to be their own separate selves. We have thoroughly enjoyed watching our children's first steps, first words, first days of school, first dates, and all the many joys of living with children and (at one point, four!) teenagers. Like most families, we have also struggled as we try to balance home life with work, and we have dealt with premature infants, speech and physical therapy, minor school problems, sibling rivalry, and many of the other challenges that can appear in family life.

Through our children we have learned the practical side of child development. We know that even the grandest theories fail to capture the challenges, complexities, practicalities, joys, and fulfillment of real life with children. We have used these experiences to inform our writing—they helped us focus on the practical applications of what we teach and what we write. We encourage students to bring their personal perspective to the study of child development; and we do the same thing, including our personal perspective at times throughout the book. We hope that our own experiences will offer students another perspective to consider.

HOW TO USE THIS BOOK

When reading textbook chapters, students often ask:
"Why should I know this material?"
or
"How is it useful in real life?" Let us show you.

Every chapter in the book begins with a story of life from another person's perspective—a real, often challenging situation that shows you how child development relates to you or to the people around you. In addition, you can watch videos with these individuals and learn more about their situations and what steps they took to overcome their challenges. These videos can be found at www.mypsychlab.com. Each of these stories is linked to Think About . . . margin questions placed at critical points throughout the chapter.

Think About . . .

Think About . . . questions ask you how you might advise the people described in the opening story, based on what you have learned thus far. By the time you finish studying the chapter, you should have a good idea about how to answer all of the questions.

Thinking Back to . . .

At the end of the chapter, Thinking Back to . . . summarizes some of the possibilities for how you could have answered the margin questions—but try answering the questions yourself before checking our summary!

Thinking Critically

We include several other perspectives as well to help you think about the content from personal, professional, and social policy points of view. To support the personal perspective, we offer the following: Thinking Critically notes in the margins where you can stop and think about how the chapter material relates to your own life.

Listen
www.MyPsychLab.com

Watch
www.MyPsychLab.com

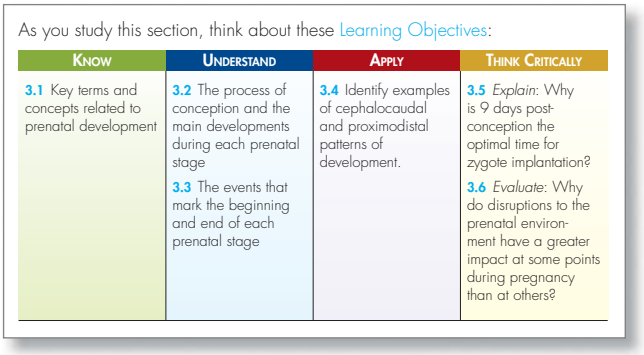
Throughout each chapter, you will be reminded by marginal icons to go online for additional study and practice within **MyPsychLab**. Videos, animations, simulations, and other tools help you better understand the concepts presented in the chapter, while practice quizzes and a personalized study plan help you prepare for your exams.

Explore
www.MyPsychLab.com

Simulate
www.MyPsychLab.com

To help you understand the professional side of this field, each chapter has a ***Professional Perspective*** feature, a one-on-one interview with someone whose job is related to child development. In addition, each chapter contains a **Personal Perspective** feature, an interview feature that introduces you to real-life parents and children. Finally, we include a **Social Policy Perspective** feature to demonstrate the importance of child development information for current social issues and policies.

These learning objectives are categorized by cognitive level (**Know, Understand, Apply, Think Critically**) to help you study the information at different levels. Being able to remember concepts or develop an example is a good start to understanding, but there are multiple levels at which you can think about information, including applying it to your own personal and professional contexts, critically evaluating concepts, and integrating your knowledge across topics. Thinking at all these levels will lead you to a fuller and deeper understanding—and make the information far more useful to you.


As you study this section, think about these Learning Objectives:

Know	Understand	Apply	Think Critically
3.1 Key terms and concepts related to prenatal development	**3.2** The process of conception and the main developments during each prenatal stage **3.3** The events that mark the beginning and end of each prenatal stage	**3.4** Identify examples of cephalocaudal and proximodistal patterns of development.	**3.5** *Explain:* Why is 9 days post-conception the optimal time for zygote implantation? **3.6** *Evaluate:* Why do disruptions to the prenatal environment have a greater impact at some points during pregnancy than at others?

There are many tools in this book to help you check your learning. As you begin each major section of every chapter, you'll find **Learning Objective questions,** designed to help you preview the important concepts you are about to study.

attachment
An emotional tie to a specific other person or people that endures across time and space.

contact comfort
The comfortable feeling that infants gain by clinging to a soft attachment figure.

The **marginal glossary** offers you a quick way to find definitions. Because the glossary terms are set in the margin of the text, you can study the important vocabulary and definitions for each chapter without having to hunt for them.

Then, at the end of each section, you'll find **Let's Review** questions to help you make sure you've mastered the material. The answers to these questions accompany them, printed upside down.

The **Chapter Review** reminds you of the main questions addressed in the chapter and gives you a quick review of the most important concepts. This summary is not meant to be a replacement for reading the chapter, but it is an effective study tool.

The chapter review also contains a **Revisiting Themes** section, recapping where the four new research themes (nature/nurture interaction, neuroscience, diversity and multiculturalism, and positive development/resilience) can be found in each chapter.

In addition, a list of key terms with page references included at the end of each chapter allows a quick flip to check key concepts and test comprehension.

TEACHING AND LEARNING PACKAGE

Pearson Education is pleased to offer the following supplements to qualified adopters.

For Instructors

Instructor's Manual (**ISBN:** 0205953638; available for download at www.pearsonhighered.com.) This robust teaching resource gives you unparalleled access to a huge selection of classroom-proven assets. Each chapter offers integrated teaching outlines to help instructors seamlessly incorporate all the ancillary materials for this book into their lectures. Instructors will also find an extensive bank of lecture launchers, handouts and activities.

Test Bank (**ISBN:** 0205953581; available for download at www.pearsonhighered.com.) This comprehensive test bank features more than 150 questions per chapter and has been fully reviewed by experienced professors. The test bank includes multiple choice, true/false, fill-in-the-blank, and essay questions, each coded with difficulty rating (easy/ medium/difficult), page references, skill type (conceptual/factual/analytical), and rationales for the correct answer.

The test bank is available in a computerized format called Pearson MyTest (0205953573), a powerful assessment generation program that helps instructors easily create and print quizzes and exams. Questions and tests can be authored online, allowing instructors ultimate flexibility and the ability to efficiently manage assessments anytime, anywhere. Available at www.pearsonmytest.com.

PowerPoint™ Presentation (**ISBN:** 020595362X; available for download at www.pearsonhighered.com.) Three different sets of PowerPoint presentations create exciting interactive tools for use in the classroom. The PowerPoint lecture presentation highlights major topics from the chapter, pairing them with select art images. In addition we offer a PowerPoint collection of the complete art files from the text which allows customized lectures with any of the figures from the text. Finally, included is a set of lecture PowerPoints with art and embedded videos.

MyPsychLab (**ISBN:** 0205954685). Available at www.mypsychlab.com, this learning and assessment tool can be used to supplement a traditional lecture course or to administer a course entirely online. Instructors decide the extent of integration—from independent self-assessment for students to total course management. Students benefit from an easy-to-use site where they can test themselves on key content, track their progress, and utilize individually tailored study plans. MyPsychLab is an all-inclusive tool, including a Pearson eText, plus teaching and learning resources organized by chapter in the form of videos, simulations, animations, assessments, and other tools to engage students and reinforce learning. Fully customizable and easy to use, MyPsychLab meets the individual teaching and learning needs of every instructor and every student. To package MyPsychLab with the student text, use ISBN 0205953735.

MyVirtualChild is an interactive simulation that allows students to raise a child from birth to age 18 and monitor the effects of their parenting decisions over time. By incorporating physical, social, emotional, and cognitive development at several age levels, MyVirtualChild helps students think critically as they apply their course work to the practical experiences of raising a virtual child. You can access MyVirtualChild within MyPsychLab, or separately at www.myvirtualchild.com.

The Development Video Series in MyPsychLab engages students and brings to life a wide range of topics spanning prenatal through the end of the lifespan. New international videos shot on location allow students to observe similarities and differences in human development across various cultures.

MyClassPrep Available for instructors within MyPsychLab, this exciting new instructor resource makes lecture preparation easier and less time consuming. MyClassPrep collects the very best class preparation resources—art and figures from our leading texts, videos, lecture activities, classroom activities, demonstrations, and much more—in one convenient online destination. You can search through MyClassPrep's extensive database of tools by content topic or by content type. You can select resources appropriate for your lecture, many of which can be downloaded directly; or you can build your own folder of resources and present from within MyClassPrep.

Pearson Teaching Films Lifespan Development Video (**ISBN:** 0205656021) This video highlights important high-interest topics in human development across the lifespan, including imagination in early childhood, motivation and school success, and aggression in adolescent romantic relationships. A video user's guide with critical-thinking questions and Web resources is available to support the use of the video in the classroom.

For Students

MyPsychLab (**ISBN:** 0205954685). With this exciting new tool students are able to self-assess using embedded diagnostic tests and instantly view results along with a customized study plan.

The customized study plan will focus on the student's strengths and weaknesses, based on the results of the diagnostic testing, and present a list of activities and resources for review and remediation, organized by chapter section. Some study resources intended for use with portable electronic devices are made available exclusively through the MyPsychLab, such as key terms flashcards and optimized Observations video clips. Students will be able to quickly and easily analyze their own comprehension level of the course material, and study more efficiently, leading to exceptional exam results! An access code is required and can be purchased at www.pearsonhighered.com or at www.mypsychlab.com.

CourseSmart eTextbook (**ISBN:** 0205953646). CourseSmart offers students an online subscription to The World of Children, 3/e at up to 60% savings. With the CourseSmart eTextbook, students can search the text, make notes online, print our reading assignments that incorporate lecture notes, and bookmark important passages. Ask your Pearson sales representative for details or visit www.coursesmart.com.

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Literally hundreds of great people have contributed their time, skill, and passion in creating this textbook. We thank our many partners at Pearson Education—they are the leaders in innovation in higher education, and we are proud to be associated with their company. Our Executive Editors, Erin Mitchell and Jeff Marshall, along with Senior Sponsoring Editor Amber Mackey, provided guidance and enthusiasm to help create the vision for this project. Their keen sense of what works in psychology textbooks helped keep us directed and motivated. Our development editor, LeeAnn Doherty, and editorial project manager, Diane Szulecki, worked with us every day to improve our writing, organize the many pieces of the project, and keep everyone focused on creating a high-quality textbook. Their gentle reminders and feedback have been greatly appreciated and have helped keep us on track throughout this revision process—Thank you Diane and LeeAnn! Sharon Geary, director of development, does great work at Pearson Education in keeping everything organized and on track. Marianne Peters-Riordan, Barbara Mack, and Louise Capulli were our project managers, and Leslie Osher was our art director—they all provided critical leadership on the project. The marketing team at Pearson Education is terrific! We thank Brandy Dawson, director of marketing, and Jeremy Intal, marketing manager for psychology. We send a big thanks to all of the wonderful sales representatives at Pearson Education—without their expert help, we wouldn't be able to accomplish our goal of connecting a wide range of students and instructors to the field of child development. Communicating the field is our passion, and we couldn't do it without the support, skills, and wisdom of all of these contributors.

We also thank Stacey Paulos, our graduate assistant, for her thorough and thoughtful literature searches.

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Teraesa Vinson, Bronx Community College

Perspective Boxes and Chapter Opening Vignette Interviewees

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ABOUT THE AUTHORS

Joan Littlefield Cook is the campus Director of Academic Assessment at the University of Wisconsin–Whitewater, where she is also a professor of psychology and has served as chairperson of the psychology department. As an undergraduate she majored in psychology at Tennessee Technological University. She earned a master's degree and PhD in psychology and human development at Vanderbilt University. Over the past 26 years she has taught courses related to child and adolescent development, educational psychology, and cognitive psychology at the University of Wisconsin–Whitewater, the University of Wisconsin–Madison, and Middle Tennessee State University. Her classes have ranged from large lecture courses (with 250 or more students) to small seminars. Joan's students have always appreciated her knowledge of the field and her ability to present information in a way that is useful, motivating, and friendly. The Student Association at the University of Wisconsin–Madison voted her as one of their most outstanding professors, and the psychology students at University of Wisconsin–Whitewater also gave her their teaching award. Joan's research is on mathematical problem solving and cognitive development. She and her colleagues have published papers in the *Journal of Educational Psychology, Cognition and Instruction, Memory & Cognition, Intelligence,* the *Gifted Child Quarterly, Reading Psychology*, and the *Journal of Experimental Psychology.* Recently, she has collaborated with colleagues to lead campus efforts to assess and improve students' critical thinking skills. She has co-authored three other books and numerous instructional materials.

Greg Cook is the Associate Vice Chancellor for Academic Affairs at the University of Wisconsin–Whitewater, where he has also served in the Dean's office, as a professor of psychology, department chair, and campus director of academic assessment. Greg majored in psychology at the University of Dayton and later received his PhD in psychology at Vanderbilt University. For the past 27 years he has taught courses in child development, research methods, statistics, and related topics at Whitewater as well as at Vanderbilt University and at the Madison and Richland Center campuses in the University of Wisconsin system. At Whitewater Greg received a college award and a departmental award for teaching excellence. Students consistently comment on his ability to present difficult information in a clear and understandable way. Greg's research on cognitive development has been published in scholarly journals such as *Child Development, Developmental Psychology,* and the *Journal of Experimental Child Psychology.* He has also collaborated with colleagues in the College of Education on studies published in the *Journal of Experimental Education*, the *Journal of Research and Development in Education,* and the *Journal of Reading Education.*

Greg and Joan also co-authored *Child Development: Principles and Perspectives,* a fresh and widely acclaimed textbook (published by Allyn & Bacon) that explores child development within a topical framework.

Exploring Child Development

Watch Visit www.MyPsychLab.com to watch an interview with Sheryl online.

Sheryl and Adam recently welcomed their third child into the family, and their lives have really changed. They used to have more time to spend one-on-one with their children, but now they are finding that it's quite a challenge to keep up with the basic care of a new baby and all of the activities that their other children take part in. Max, their oldest, is 9 years old. He's really smart and loves school and video games, and he's an excellent skier for his age. He sometimes has a mind of his own, however, and loves demonstrating his independence. Isabella is 6, and she's very active in gymnastics, dance, acting, and music. Although she's only in first grade, she's ambitious with all of her activities, and she also shows a soft spot in caring for other people. It's really cute to watch her cuddle with her new baby sister. Zoey, the new addition, is already very different from her older brother and sister. Zoey is more relaxed and laid back than the others were as infants. She isn't rolling over yet or showing the kinds of muscle coordination that the other children did at her age, but she is more sociable—she loves to smile and coo anytime people are near. Zoey also looks different than the others. Her hair and eyes are a lighter color, and her skin has a more delicate complexion.

Sheryl wonders what her children will be like when they get older. She doesn't mean to compare them, but she is surprised at how different they are. She and Adam don't think they are treating the children all that differently, but they certainly do have different interests and personalities. How does that happen? Sheryl tries not to worry too much. Like most parents, she wants her children to be happy and to do their best. Raising children is a challenge, but Sheryl and Adam are both excited when they look into the future and wonder how their children will turn out. They think about what they can do to help their children the most, and they want to enjoy each one of them as a unique and special individual.

As you read through this introductory chapter, think about the information from the perspective of these parents. What advice could you give to Sheryl and Adam as they think about the best ways to care for their children? What do researchers know about children's development, and why do children from the same family sometimes seem so different? What are the stages of development that children go through as they grow and mature? What are the forces that drive development? After studying this chapter, you should be able to use at least a dozen concepts about child development to give Sheryl and Adam specific answers to these questions.

As you read this chapter, look for the "Think About Sheryl and Adam . . ." questions that ask you to consider what you're learning from their perspective.

Defining the Field

- What Develops?
- Themes in Child Development

Theories of Child Development

- What Is a Theory, and Why Are Theories Useful?
- Psychoanalytic, Behavioral, and Social Learning Theories
- Cognitive, Biological, and the Contextual and Systems Theories

Research in Child Development

- Descriptive Research Methods
- Correlational Research Methods
- Experimental Research Methods
- Methods for Assessing Development
- Ethics in Research with Children

Applications and Careers Related to Children

- Practical Applications of Child Development Research
- Careers Related to Children

Thinking Critically

In what ways are you different as an adult than you were as a young child? In what ways are you still the same? What factors do you think were most influential in your own development?

There are few things more amazing to watch than the growth and development of a child. Babies are tiny and helpless at birth, but in just a few short months they are crawling about, feeding themselves, and exploring everything in sight. Before long, they are starting their first day of kindergarten, and later they are going on first dates, learning to drive a car, and eventually starting their own jobs and young adult lives. Their progress through childhood and adolescence is remarkable.

Have you had the opportunity to closely watch a child grow and mature? If not, you can reflect on your own development. You are obviously larger, stronger, and more coordinated than you were as a young child. You also have much more factual knowledge and more effective and efficient problem-solving skills. Your social relations are very different, especially if you have moved away from your family or have started a family of your own. Yet in other ways you have kept many of the qualities you had at the outset. For example, maybe you were shy as a child and continue to be reserved and reflective today, or perhaps you were very active as a child and are still energetic and athletic.

This text explores the many changes and similarities we see as we track child development from birth through childhood and the adolescent period. After the first three chapters on beginnings, we will divide the text into the following parts:

- *Infants and Toddlers: The First Years* covers birth to age 2, as infants and toddlers get their starts in life;
- *Early Childhood: The Playful Years* covers ages 3 to 6, as children play, make friends, and explore the world around them;
- *Middle Childhood: The School Years* covers ages 7 to 11, as children focus on school and learning; and
- *Adolescence: The Transition toward Adulthood* covers ages 12 and up, as children move into puberty and teenagers emerge into adulthood.

Each section includes one chapter on physical development, one chapter on cognitive development, and one chapter on socioemotional development. Putting these chapters together will give you a feel for the developmental challenges and advances that take place within each age level.

Chapter 1 introduces you to the field of child development. First we'll define the field of child development, examining the basic issues and questions it addresses. Then we will give you a brief overview of some of the most important theories and research methods used in the field and show you how this information applies to the real lives of children.

▲ Differences in physical development are obvious when you compare the children in this photo. Size, strength, and coordination all increase with development.

Defining the Field

In the field of **child development**, professionals from psychology, education, sociology, anthropology, social work, biology, medicine, economics, and other related fields work together. Their shared purpose is to describe and understand the important changes that take place as children move from infancy through childhood and adolescence. Children are changing every day—growing, gaining knowledge, and learning new skills. Yet in some ways children remain the same across their development. For example, a child who was happy and outgoing as a toddler may remain happy and outgoing throughout the rest of his or her childhood.

child development
Field of study in which researchers from many disciplines work to describe and understand the important changes that take place as children grow through childhood.

Understanding child development is important for everyone who wants to work with or help children. Parents naturally have a personal stake in providing the best environment and support they can. Teachers, counselors, social workers, psychologists, nurses, and other professionals who help children also need to understand the fundamental principles of development as well as the various ways that development can be disrupted or affected. Understanding child development can also help you understand your own progression

into adulthood: Knowing more about where you came from can help you appreciate your current phase of life and may give you insights about where you are headed next.

As you study this section, think about these Learning Objectives:

Know	Understand	Apply	Think Critically
1.1 Key terms and concepts related to defining the field of child development	**1.2** The three main areas that child development researchers study **1.3** Several main themes that run across child development research today	**1.4** Identify an example of each theme discussed. **1.5** Give examples of how a better understanding of diversity contributes to a better understanding of child development	**1.6** *Analyze*: Why is it important for researchers to continue to study *nature* and *nurture*? **1.7** *Evaluate*: What are the implications of shifting to a research focus on *positive development* and *resilience* for our understanding of child development? **1.8** *Explain*: How does understanding the main themes of child development help you to critically evaluate and apply child development research?

What Develops?

A child's development is multifaceted. The most visible component is **physical development**. Children grow in size, and their muscles become stronger and more coordinated. At birth, newborn babies cannot even hold their heads up, but over the following months, they will make tremendous gains in muscle strength and coordination. Later they will crawl, take their first steps, and eventually learn to ride bicycles and play sports. Many children go through a "lanky" period—a time when a rapid gain in height outpaces the gains in weight and muscle mass. During adolescence, sexual maturity is attained, and the adolescent's physical appearance becomes more adult-like. The brain and nervous system grow and mature across childhood too, contributing to many of the changes we see in coordination and skill.

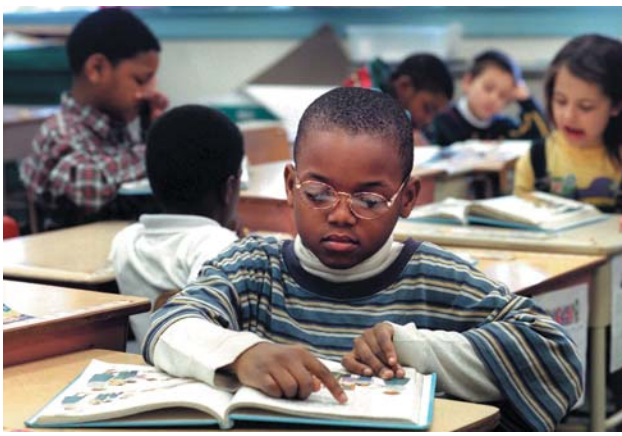
Cognitive development consists of numerous changes in how children perceive the world, process information, store and retrieve memories, solve problems, and communicate with language. Infants explore the world all around them, and they begin to speak their first words as they learn names for common objects and events. Later, we see cognitive growth most easily in the progress children and adolescents make in their academic work: learning to read and write and gaining mastery of mathematics, social studies, science, art, and other topics. Underlying and supporting this growth are gains in perception, information processing, memory, and problem solving.

Children also make rapid progress in **socioemotional development**. As infants, they depend on their parents and other family members for food, safety, and entertainment. As they grow, they begin to meet and interact with childhood peers, which helps

physical development
Component of development related to growth in size, strength, and muscle coordination.

cognitive development
Component of development related to changes in how children perceive the world, think, remember information, and communicate.

socioemotional development
Component of development related to changes in how children interact with other people (e.g., family members, peers, and playmates) and manage their emotions.



▲ How do cognitive activities change with development? Researchers study how perception, memory, intelligence, problem solving, language, and other thinking skills develop during childhood and adolescence.

improve communication and emotional skills. Toddlers play readily with mates of both genders, but by middle childhood true friendships are established and most playmates are of the same sex. Later, most adolescents will struggle with the challenges of meeting potential partners and dating, exploring their own sexual identities, and forming intimate relationships.

Of course, these three aspects of development do not operate in isolation. The *biopsychosocial approach* explains that biological, psychological, and social factors all interact in sometimes complex ways to influence development. The model was first developed as a way to better understand illness and wellness, but it is also useful for understanding development. For example, researchers looking at children's performance on mathematical story problems might interview children as they solve problems, examine how many problems are answered correctly, and even track what aspects of a problem the child looks at while solving the problem. But what if the child experiences math anxiety, misperceives numbers (seeing "9" when the problem actually has a "6"), or simply does not like mathematics? These aspects of learning and doing mathematics will probably not be captured if researchers focus just on cognitive development.

Think About Sheryl and Adam . . .

What examples of physical, cognitive, and socioemotional development did you notice in the descriptions of Sheryl and Adam's children? What other examples might you expect to see for each type of development?

▲ How do social skills change with age? Friendship patterns, play, and cooperation are just a few of the topics that researchers study in the area of socioemotional development.

Themes in Child Development

Children's lives are complex, and their growth and development is influenced by a vast array of influences. As you read through this text, you will learn many of the details that researchers have learned about child development. For some of the topics, we trace the research back to its origin, as students often have a better appreciation of what the research looks like today if they understand where the research started. For most topics, however, we concentrate on the most current research. To help you keep all of this information in perspective, we'd like you to think about four major themes that we see in child development today. Although these themes have been emerging for many years, they have now risen to a level of prominence that helps us define the modern approach to the study of child development.

Nature and Nurture. First, children's growth and development is influenced by both nature and nurture. **Nature** refers to the biological forces that govern development. Just as a seed contains genetic information that controls how a seedling will grow into a beautiful flower, children also have genetic information coded deep inside all of the cells in their bodies. This genetic information controls how the body forms and grows, and it also influences many of our important human traits. By now you know that genes influence the color of your eyes, but did you also know they play a role in determining your height and weight, your level of intelligence, and even your basic personality?

Nurture refers to the supports and conditions that surround children and influence their development. For healthy development, children need the love and support of parents, siblings, extended family, teachers, peers, and other people important in the child's life. Children are also influenced by the cultural and socioeconomic environment surrounding them. Poverty, malnutrition, and a lack of adequate medical care can have negative effects on their growth and development. Cultural heritage and diversity can enrich their lives, and the neighborhood where the child lives can determine the types of schools and peer groups the child will have. All of these influences lie outside the child's own biology, and they are all considered part of nurture. Nurture also includes the experiences the children have and the things they learn from their environments.

nature
The biological forces (e.g., genetics) that govern development.

nurture
The environmental supports and conditions that impact development. Also refers to learning and experience.

Throughout history, philosophers and scientists have debated the relative roles of nature and nurture. John Watson, a renowned American psychologist of the early twentieth century, was a strong proponent of the nurture school. He wrote,

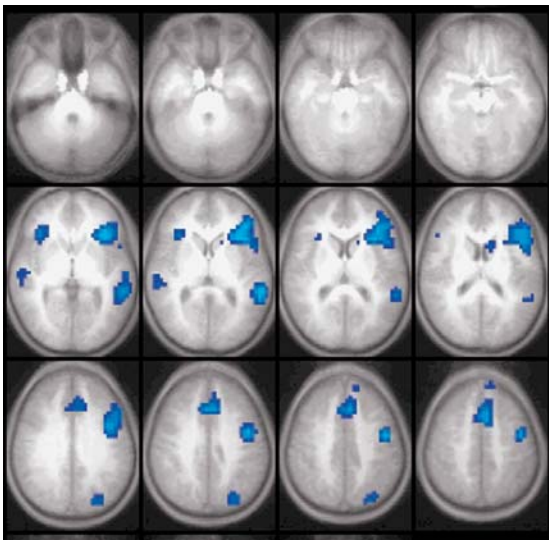
> [G]ive me a dozen healthy infants, well formed, and my own specified world to bring them up and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and ancestors (1930/1924, p. 104).

Watson argued that experience and learning—nurture—determined what children would become. But other researchers have disagreed, pointing out that characteristics such as intelligence and personality are determined more by genetics (nature) than by nurture. For example, researchers have shown that the IQ scores and other measures of general cognitive ability of identical twins are more similar than the scores of fraternal twins (Bouchard & McGue, 1981; Haworth et al., 2009; Polderman et al., 2006). Identical twins have the same genes as each other but fraternal twins have only about half of their genes in common, so these researchers argue that the increase in similarity in intelligence is controlled by the increase in genetic similarity between the twins. A similar conclusion comes from studies of children who were adopted as young infants. By the time adopted children grow up to age 18, their IQs are more similar to the IQs of the biological mothers who gave birth to them than they are to the adoptive parents who raised and nurtured them (Loehlin, Horn, & Willerman, 1994; Scarr, Weinberg, & Waldman, 1993). On the other hand, the IQs of identical twins are more similar when the twins are raised together than when they are adopted and reared apart (Bouchard & McGue, 1981). This demonstrates that IQ is controlled by more than genetics—it is also influenced by nurture.

The debate about nature and nurture can be traced back to the very beginnings of psychology and philosophy. However, with the technologies being used today scientists are uncovering fascinating new details about the functions of genes and genetic inheritance. Consequently, the nature–nurture issue is again rising to be one of the hottest issues studied in the field. Modern researchers understand that nature and nurture work together, and it is impossible to distinguish their separate effects (Gottlieb, 2007; Lerner, 2006; Meaney, 2010). Rather than arguing about which one is most important, researchers are shifting their focus to studying exactly how the two groups of factors interact with each other. We will have much more to say about nature, nurture, and their interactions in Chapter 2.

Thinking Critically

Consider your own biological tendencies (the influence of nature). How did different environmental factors in your childhood interact with these tendencies? How would you be different had you grown up in a different family, city, or culture?



▲ This fMRI scan shows a composite image of brain activity taken as children think about a problem. Notice how the frontal lobe is especially active in this task. Neuroscientists use technologies like this to study how the brain functions and changes as children grow and learn new skills.

The Role of Neuroscience.

Neuroscience is a growing field in which psychologists, biologists, and other scientists study the structure and function of the brain and nervous system. Scientists are busy studying which areas of the brain are most responsible for speaking, reading, solving problems, coordinating muscles, and performing many other tasks and skills. We have learned how children's speed and coordination improve as pathways in the brain mature, and we are learning more about how hormones, genes, and other biological features influence children's behaviors, cognitive processes, and even emotions.

Recent technological efforts have focused on ways to visualize all the connections between neurons in an intact brain, an approach called *connectomics*. One approach labels each neuron a different color, then identifies and tracks changes in connections among neurons. As this research continues, we will learn more about how biological changes impact child development and also about the reverse—how children's experiences influence their own biological development.

neuroscience
Study of the brain and the nervous system.

▲ Children growing up today experience even more diversity and multiculturalism than ever before.

Diversity and Multiculturalism. A third theme that we want to emphasize is that researchers are now spending more time studying how diversity enriches children's lives. More than ever before, we are seeing research on children from racial and ethnic minority families, from immigrant families, and from families speaking two or more languages. Researchers are interested in the issues faced by gay and lesbian parents, by divorced and single parents, and by parents who adopt children from the United States or from abroad. On an even larger level, psychologists, sociologists, and other researchers are investigating how cultures and cultural values impact society, and then in turn how society influences family life and children. As our nation becomes even more multicultural, the increasing diversity we see in our neighborhoods, schools, and families will no doubt pose many challenges, but it will also add richness to all of our lives.

Positive Development and Resilience. Finally, we want to emphasize that most children experience positive growth and development. Most children are happy and healthy; teenagers more often than not report that they enjoy their relationships with their parents, and most go on to be successful in school, careers, and life. Throughout this text, you will read about research on birth defects, mental illnesses, family problems, forms of abuse, and many other topics related to negative pathways of development. Researchers need to investigate these important issues so we can all understand how to better help children and their families. In recent years, however, there has been a move toward increasing research in **positive psychology** and in understanding when and how children develop in positive ways. Even when the odds seem stacked against children, as when they have serious health problems or live in poverty, many children prove to be **resilient**—they rise above adversity and beat the odds. In this text, we will discuss many of the problems that can occur in development, but we will also emphasize the positive paths that most children take.

These four themes represent some of the most vibrant and cutting-edge research in the field of child development. We highlight examples of this research throughout the text. For easy access, we also summarize these topics at the end of each chapter in our Revisiting Themes section (see page 36, after the Chapter Review).

LET'S REVIEW. . .

KNOW

1. Which of the following professions contributes to the field of child development?

a. psychology
b. sociology
c. economics
d. all of the above

UNDERSTAND

2. Learning new strategies for solving problems and remembering information is part of

a. cognitive development.
b. physical development.
c. social development.
d. natural development.

3. What was John Watson's position on the nature–nurture debate?

a. Nature plays the biggest role in child development.
b. Nurture plays the biggest role in child development.
c. Nature and nurture play equal roles in child development.
d. You can never tell which force (nature or nurture) is playing the biggest role.

(Continued)

Apply

4. True or False: Genetics is an example of how nature can influence a child's development.

Think Critically

5. The general conclusion that researchers draw from studies of twins and adopted children is that

a. nature governs most of child development.
b. nurture governs most of child development.
c. nature and nurture both interact to govern child development.
d. neither nature nor nurture play strong roles in child development.

6. True or False: The fact that IQ scores are more similar between identical twins than between fraternal twins shows the influence of nurture on children's intellectual development.

Answers: 1. d, 2. a, 3. b, 4. T, 5. c, 6. F

Theories of Child Development

Now that we've outlined common issues studied in child development, let's take a look at the main theories that have been offered to explain how child development occurs. Over the years, researchers have gathered countless observations and facts about all facets of children's development. Data exists on everything from average heights and weights to IQ scores to friendship and play patterns to the effects of discipline and divorce. This vast array of facts would be incomprehensible if the data were not organized in some coherent fashion. In this section, we will explain why researchers develop theories to organize the facts. We will also describe some of the most important theories that have influenced the field of child development.

As you study this section, think about these Learning Objectives:

Know	Understand	Apply	Think Critically
1.9 Key terms and concepts related to defining the field of child development	**1.10** The main concepts for each theory	**1.11** Provide an example of how each theory has been used in child development research or practice.	**1.12** *Evaluate*: How could data be integrated and understood if we *didn't* have theories? **1.13** *Analyze*: What are the main similarities and differences among the theories? **1.14** *Integrate and Create*: Identify an issue or problem related to child development. Use each theory to explain the cause(s) and possible solutions/interventions.

positive psychology
Refers to a new emphasis in psychology on the study of happiness and positive development.

resilient children
Children who rise above adversity to become successful or otherwise develop in positive ways.

What Is a Theory, and Why Are Theories Useful?

A **theory** is an explanation of how facts fit together. Theories provide frameworks that show how the facts are organized and related, and these frameworks can serve several useful functions (Thomas, 2000):

- *Theories summarize the facts as currently known.* By understanding contemporary theories you can see what researchers currently know about child development. By tracing important theories through history, you can see what experts once thought and how knowledge and ideas have changed over time.
- *Theories allow prediction of future behavior and events.* Theories tell us how the facts or events tend to be related in most situations; so if we know that one of the events is occurring now, then we can predict that the related events will soon follow. For example, an accurate theory of discipline should tell us how children tend to respond to harsh punishment versus milder forms of punishment. Then, if we know that a particular child is receiving harsh punishment now, we can predict what the child's response might be (soon or in the near future).
- By allowing prediction, *theories provide guidance* to parents, teachers, counselors, therapists, social workers, and others who work with children.
- *Theories also stimulate new research and discoveries.* By definition, theories cannot be directly verified, so researchers test theories by drawing specific inferences, or **hypotheses**, from the general theories and then collecting scientific observations to find out if the hypotheses are valid. In the course of testing hypotheses, researchers make observations, collect facts, and may make new discoveries. This process often leads to revisions in the initial theories and sometimes to the development of new theories.
- Finally, *theories act as filters* for identifying relevant information, observations, and relationships. Theories influence how we look at children and their development, and the kinds of questions researchers ask about development. In this way, theories act to filter out questions and observations that don't seem relevant to the theory; what does seem relevant is allowed to pass on to the next level of consideration. A researcher will see the simple act of a child helping his or her father, for example, very differently depending on whether the researcher views the behavior through the filtering lens of a psychoanalytic, behavioral, or ecological theory.

Table 1.1 on page 9 provides an overview of some of the major theories of child development. Psychoanalytic theories were among the earliest in the field; they had a major influence in shaping our early notions of child development. The development field has largely discarded these theories, however, as the newer theories have proved to be more accurate and useful. The behavioral and social learning theories were prominent in the mid-twentieth century. Although newer approaches have emerged since, professionals who work with children still rely on these theories to design programs to modify children's behavior. Cognitive theories rose to prominence in the late 1900s. Contextual and systems theories, such as dynamic systems, are relatively new and their potential is still being explored.

As you read about these various theories, keep in mind that each one offers a summary of what researchers knew and suspected about child development at a given time. Theories change as science progresses. Also, don't expect any one theory to explain everything about child development. Most theories are targeted at certain aspects of child development—such as how children learn, how they think about things in the world, or how they interact with the people around them. No theory by itself is sufficient to explain every process and change that occurs as children grow and develop. Today, many psychologists and researchers take an eclectic view that combines the main concepts across several theories

theory
An explanation of how facts fit together, allowing us to understand and predict behavior.

hypotheses
Specific inferences drawn from theories; researchers test hypotheses by collecting scientific observations.

TABLE 1.1
An Overview of Major Developmental Theories

PSYCHOANALYTIC THEORIES	BEHAVIORAL AND SOCIAL LEARNING THEORIES	COGNITIVE THEORIES	BIOLOGICAL THEORIES	SYSTEMS THEORIES
Focus on personality development and effects of conscious and unconscious mind on behavior and development.	Focus on observable conditions in environment and how they relate to observable behaviors.	Focus on how children learn to think.	Focus on biological and physical explanations of development.	Focus on complex interactions among layers of systems and variables.
PSYCHOANALYTIC (SIGMUND FREUD)	*CLASSICAL CONDITIONING (IVAN PAVLOV, JOHN WATSON)*	*COGNITIVE DEVELOPMENTAL (JEAN PIAGET)*	*ETHOLOGY (KONRAD LORENZ)*	*ECOLOGICAL SYSTEMS (URIE BRONFENBRENNER)*
• Mind contains the id, ego, and superego; all are in constant conflict. • Five stages of psychosexual development. • Personality is well developed by end of adolescence.	• Behavior controlled by stimulus–response connections. • Unconditioned stimulus reflexively elicits unconditioned response; unconditioned stimulus paired with neutral stimulus; conditioned stimulus comes to elicit conditioned response. • Explains the development of many fears.	• Children actively construct their own understanding. • Children develop mental schemes to represent their understanding. • Children assimilate and accommodate their schemes. • Four major stages of cognitive development.	• Based on Darwin's theory of evolution and natural selection. • Study behaviors that help animals (including humans) compete and survive.	• Layers of systems affect the development of the child. • Layers include interactions among family, friends, schools, neighborhoods, government agencies, parents' workplace, and the values, laws, and customs of the larger society. • These interactions change over time.
PSYCHOSOCIAL (ERIK ERIKSON)	*OPERANT CONDITIONING (B. F. SKINNER)*	*SOCIOCULTURAL (LEV VYGOTSKY)*	*NEUROSCIENCE*	*DYNAMIC SYSTEMS*
• Focus on development of healthy ego identity. • Series of eight psychosocial crises. • More positive or more negative crisis resolution dependent on interactions with other people. • Personality development is lifelong.	• Behavior influenced by the consequences of actions. • Reinforcement increases probability of a behavior being repeated; punishment decreases the probability of a behavior being repeated. • Children adjust behavior to gain reinforcement and avoid punishment.	• Emphasized roles of culture and social interaction in cognitive development. • Children adopt the psychological tools created and encouraged by their cultures. • Social speech is internalized as private speech; eventually becomes inner speech.	• Direct observation of brain and nervous system structures and functions during thought. • Uses technological advances to identify specific areas of brain activity related to mental functions and behaviors.	• Theories based on models used by mathematicians and physicists to understand complex systems. • Complex interactions of multiple factors can appear chaotic, but stable patterns can emerge as the system self-organizes. • Patterns change over time.
	SOCIAL LEARNING (ALBERT BANDURA)	*INFORMATION PROCESSING*		
	• Children learn by observing and imitating others' behavior; they do not always need reinforcement or punishment. • Reinforcement and punishment give information to help children think about which behaviors to imitate.	• Detailed analysis of processes used in thinking. • Emphasis on roles of basic processing efficiency, prior knowledge, and memory.		