

Preface

Welcome to the remarkable world of child and adolescent development. Many of you are reading this book because you plan to be teachers, counselors, speech therapists, recreational leaders, or medical practitioners. Some of you will be (or already are) parents. All of you are citizens who influence the lives of children through your knowledge, votes, and participation in communities. The material in this text should be of interest to everyone who is concerned about children and adolescents, from the library volunteer to the principal of a school for children facing the challenges of learning in a new language.

No background in human or developmental psychology is necessary to understand this material. We have avoided jargon and technical language whenever possible and focused on writing a clear, relevant, and interesting book on an exciting topic. We also have written this book with three features ever in mind:

- A chronological framework for discussing child development
- A commitment to clear explanations of theory coupled always with applications to practice
- A complete and thorough integration of diversity

CHRONOLOGICAL FRAME

As you glance at the table of contents for this book, you will notice that we examine three different *areas* of child development—physical, cognitive, and social emotional—during the specific *time periods* of infancy and toddlerhood, early childhood, middle childhood, and adolescence. Of course, these are not exact categories. Children develop continuously, not only across time periods, but also across areas—physical development is not separated from cognitive development, and emotional development does not proceed independently from social or physical development. Children are whole, and so is their development. But you are likely to work with particular age groups, so it makes sense to consider all that is going on with those children during specific periods of their lives. By dealing separately with time periods and areas of development, we hope to paint a more complete and integrated picture that you can use as you interact with real children and adolescents.

THEORY INTO PRACTICE

In the next few hundred pages, you will explore the implications and applications of the best research on child development. Theory and practice are not separated in these pages; they are considered together. We show how you can apply information and ideas drawn from research in child development when working with, relating to, and supporting all children. To help you explore the connections between research and practice, you will encounter a wealth of examples, children's words and images, case studies, guidelines, and even tips from experienced practitioners. As you read this book, we believe you will see the immense value and usefulness of child development.

THE CASEBOOK

WHAT WOULD YOU DO? DECISIONS ABOUT INTELLIGENCE TESTING

This is not your favorite time of year. As the only counselor in the middle school, you have come to almost dread the arrival of “the scores.” Last week, the school sent out results of the placement test that determines who is eligible for the highly regarded, but selective, gifted and talented program. All students in the school had taken the standardized, paper-and-pencil, group-administered test to determine if they met the selection criterion of an IQ score of 130 or higher. Again this year, the calls, e-mails, and notes are flooding in. Some parents want to meet with you to talk about their child’s scores, and especially, as one father put it, “To tell you how smart Jason really is.” One mother is incensed because the school cut back on the music program. She had read an article claiming that music lessons raise IQ scores and now is sure that her daughter would have scored better on the test (and been selected for the gifted program) if she had continued in music class. Several other parents have found an online IQ test, given it to their child, and now want the school to admit their children to the gifted program based on the higher online test results. A few of the wealthier parents have hired a psychologist to

administer an individual test and want those results used for the admission requirement. Also troubling is your meeting with a girl who was selected for the program but refuses to be a part of it because her best friends were not selected, and she says, “I’m not really that smart.” And today, another possible problem caught your eye. As you look down the list, there are very few students of color and virtually no children of recent immigrants. Maybe this whole process is flawed, but the gifted program is admired all over the district. You look at phone messages and e-mails and wonder where to start.

CRITICAL THINKING

- What does an IQ score of 130 mean? Is it a good guide for identifying students for a gifted program? Should other factors besides IQ be considered?
- Does it matter that the test was a paper-and-pencil test administered to the whole group at once, as opposed to an individually administered test?
- Are such tests appropriate for primary grade students? For students whose home language is not the language of the test? For students who live in poverty?
- What is intelligence? What factors influence its development?
- Why might a child ask to be left out of a gifted program?
- Are online tests a good measure of intelligence? Why or why not?

One way we make theory into practice real is by starting every chapter with a vivid case situation, so we ask, “**What Would You Do?**” We end the chapter with ideas from experts and ask, “**What Would They Do?**” In this edition, we have added experts from a range of fields including child life specialists, school psychologists, youth recreation coordinators, adolescent substance abuse program workers, and an assistant principal. As you read each chapter, the intricacies of the case may become more apparent and the answers of the experts more interesting. Do you agree with their suggestions?

POINT/COUNTERPOINT

Are Numbers Innate or Learned?

Throughout this text we will be examining some debates in child development. We will look at the arguments for both sides, so this feature is called *Point/Counterpoint*. Here is the first one.

What seems like a simple notion, that 3 cups in a stack is the same number as 3 birds on a telephone wire, is not so simple. After all, the stacked cups and the lined-up birds look quite different. And what about counting? Different languages have very different ways of saying 17, for example. In English, 17 is “seventeen,” but in French it is “dix-sept” or 10 + 7. Some psychologists claim that this whole process is easier because an understanding of number is innate—we are born with it. Others believe that we have to learn the meaning of numbers. Let’s look at the arguments. After you read these positions, you might listen to a podcast on innate numbers from Radiolab (wmyc.org/shows/radiolab/episodes/2009/10/09/segments/137633).

POINT

WE ARE BORN WITH A SENSE OF NUMBERS

The idea that people are predisposed to understand numbers

then renewed attention to a new number, doesn’t work, however, with larger numbers, say 4 or above. Based on these studies and others like it, Gelman and her colleagues (Gelman & Gallistel, 1978; Starkey, Spelke, & Gelman, 1990) concluded that humans must be born with a sense that 2 is different from 3; that is, babies have “a clear understanding of the number continuum, which they can apply at first only to small numbers but extend to larger numbers as they grow older and their cognitive powers and memory capacities increase” (P. Bryant & Nunes, 2004, p. 414).

COUNTERPOINT

WE NEED TO LEARN ABOUT NUMBERS

But are these experiments really about number? Other researchers claim that although these babies are detecting differences, they are not differences in number, just differences in the amount of “stuff” in the displays. To test this, researchers tried using 3 small dots in the first habituation phase, and then showed 3 larger dots in the checking phase. After habituating (growing

As we take theory into practice, we challenge readers to avoid the trap of making “either/or” judgments and decisions. What matters more, nature or nurture? Who has greater influence, parents or peers? Which is more valid and reliable, the wisdom of practice or scientific research? Should we encourage stem cell research? Should we leave babies alone or pick them up every time they cry? Should children diagnosed with attention deficit hyperactivity disorder take pills? Do sex abstinence campaigns work? In every chapter we challenge critical thinking with a feature called **Point/Counterpoint** on these and other controversial issues.

CONNECTING WITH CHILDREN

Guidelines for Teachers and Other Professionals: Interviewing Children and Eyewitness Testimony



Plan the interview to make the most of the child’s memory.

Examples

1. Interview the child as soon as possible after the event.
2. Have the interview in a simply furnished room with child-friendly furniture and not too many toys—these could suggest make-believe play.

Establish rapport.

Examples

1. Be friendly; avoid titles like “Doctor,” or “Officer.”
2. Make sure the child knows it is OK to say, “I don’t remember,” “I don’t know,” or “I don’t understand.” Practice answering made up questions this way. For example, ask, “What did your mommy say the day you were born?”
3. Tell the child you have no information about the event and the child should just report what he or she remembers because you were not there.

Do not use suggestive techniques.

Examples

1. Avoid leading questions such as, “What happened after he hit you?” Ask open-ended and free recall questions such as, “Tell me what happened yesterday on the playground,” or “Is there anything else you can tell me?”

Encourage children to monitor the source of their information.

Examples

1. Ask the child to think carefully about where the information came from.
2. Ask if the child heard from others about the event.

Respect the child’s wishes.

Examples

1. If the child does not want to talk about a topic, don’t press.
2. If the child wants to end the interview, say, “OK, we can talk again another time.”
3. End the interview with a thank you, and then discuss something neutral such as what the child is doing after the interview.

Learn more about interviewing.

Examples

1. See ipt-forensics.com/journal/volume6/fg_3_2.htm, taken from the journal, *Issues in Child Abuse Accusations*.
2. See UNICEF: *Principles of Ethical Reporting on Children* at unicef.org/media/media_tools_guidelines.html
3. See the journal *Law and Contemporary Problems* online at law.duke.edu/journals/lcp/articles/

But don’t worry. This is not another academic text that presents competing theories and nothing else. In every chapter, we also have several sections called **Connecting with Children** that provide guidelines and examples for teachers, parents, and other caregivers about how to support the physical, cognitive, emotional, and social development of children and adolescents.

DIVERSITY

Every person develops in context—in families, communities, countries, and cultures. Individuals develop first in the context of their mother’s womb but also in the context of their own unfolding and interacting genes. Every generation develops in a different context of history. Children learn one language or several languages. They learn in schools and in cliques, clubs, churches, and gangs. In every culture and across time, relationships with adults provide important guidance and support in the development of children and adolescents.

We honor this diversity by including research on many developmental pathways across a range of cultures. We are careful to note the nationality, ethnicity, and socioeconomic status of the participants in the research we describe and not to assume that what applies to one group applies to all. We sought out work on children with varying abilities and disabilities, children in different countries, children who do not speak English, and children who represent a range of poverty and privilege.

In every chapter we have a section called **Relating to Every Child** in which we go beyond acknowledging diversity to respecting and celebrating it. Some of the topics included are teaching bilingual children to read, building on children’s funds of cultural knowledge, physical activity around the world, the impact of war on children’s mental health, and cultural perspectives on decision making in adolescents.

We also honor the diverse talents of children by using children’s art from around the world for the book cover and the opening page of every chapter. Our flower cover art was painted by Jenny H., age 5, from the United States. Our chapter artists are:

Chapter	Artist	Age	Home Country
1	Nino B.	10	Georgia
2	Ester Y.	9	United States
3	Aiswarya L. S.	6	India
4	Makenna W.	2	United States
5	Holly B.	6	Australia
6	Mahira N. M. A.	3	Indonesia
7	Emma W.	5	United States
8	Tobithe M. J. W.	10	Cameroon
9	Ying T. H.	12	Malaysia
10	Andrea K.	10	Botswana
11	Yu H. P.	14	United States
12	Ankitha V.	12	India
13	Rachel S.	12	Canada

We hope you enjoy and marvel at their work as much as we have.

NEW TO THIS EDITION

In this edition, we have incorporated over 400 new references from a range of fields. New or updated topics include:

- Current statistics on children and adolescents today
- The importance of play in children’s development, including cultural differences in play
- Genes and inheritance

RELATING TO EVERY CHILD

Different Parenting Styles in Different Cultures

NOT EVERY STUDY finds results consistent with Diane Baumrind’s findings about the problems that accompany authoritarian styles in White, middle-class families. Other research indicates that higher control, more authoritarian parenting is linked to better grades for Asian and African American students (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). Parenting that is strict and directive, with clear rules and consequences, combined with high levels of warmth and emotional support, is associated with higher academic achievement and greater emotional maturity for inner-city children (P. W. Garner

alternative parenting style of *chiao shun* (a Chinese term that Chao translates to mean “training”) better characterizes parenting in Asian and Asian American families. Chao is also studying whether serving as a translator or “language broker” for parents who do not speak English has an impact on the child’s psychological well-being and relationship with the parents.

Research with Latino parents also questions whether parenting styles studies based on European American families are helpful in understanding Latino families. Using a carefully designed observation system, Melanie Domenech Rodriguez

Sources of bias in research
 Teratogens and pregnancy
 Pregnancy across cultures
 Fathers' influences on prenatal development
 Responsive parenting
 Development of the brain, including sex differences, and implications for teachers and parents
 Perspectives on intelligence and implications for practice
 Expanded coverage of self-regulation
 Contributions of neuroscience to children's learning
 Expanded sections on including children with disabilities
 More on media violence
 New section on resilience
 Second-language learning and development
 Importance of class climate and relationships with teachers
 Additional coverage on romance and parenting
 Alternative programs for high school students
 New section on transitioning from school to work
 Updates on nutrition and MyPlate guidelines, physical activity, and childhood obesity
 Anorexia, bulimia, and pro-ana/pro-ima Web sites
 Culturally relevant assessment
 Computers and games for learning
 The impact of early and late maturation of adolescent development
 Gender, racial, and ethnic diversity and participation in science, technology, and math (STEM) fields

Policy Boxes

In addition to this extensive new material, in the second edition, we have added a feature that considers the implications of child development theory and research for social policies. You are a citizen with a voice to shape the societal policies and practices that impact children and adolescents in your world. In every chapter we address a critical policy issue and include guidelines for evaluating policies or ideas for how policy makers can help support well-being and development. Topics include:

Policy and Child Well-Being: Guidelines for Evaluating Policies that Support Children
 Policy and Child Well-Being: Ethics in Research with Children
 Policy and Child Well-Being: Healthy Pregnancies
 Policy and Child Well-Being: Early Intervention for Children with Developmental Challenges
 Policy and Child Well-Being: The Neglected Issue of Child Neglect
 Policy and Child Well-Being: Dual-Language Learners
 Policy and Child Well-Being: Reporting Child Abuse
 Policy and Child Well-Being: Preventing Concussion and Head Injuries in Sports
 Policy and Child Well-Being: Culturally Relevant Assessment
 Policy and Child Well-Being: Zero-Tolerance Policies Don't Solve the Problem of Bullying
 Policy and Adolescent Well-Being: Disabilities and Physical Activity
 Policy and Adolescent Well-Being: Women in STEM
 Policy and Adolescent Well-Being: Protecting Privacy Online

ADVANCES IN DIGITAL TECHNOLOGIES REFLECTED IN THE BOOK'S PEDAGOGY

Resources available in the etext enable you to observe development in context and to apply and assess your understanding of the concepts in the book.

Embedded Video Examples and Explanations

The use of videos as examples of key concepts in the Pearson etext allows you to see many concepts and principles in action. In one video from Chapter 10, for instance, 10-year-old Daniel describes what makes him and other children of his age happy, sad, or angry; in another, a teacher conducts a classroom meeting about bullying.

Check Your Understanding Quizzes

Throughout the chapters, you'll find Check Your Understanding quizzes at the ends of major text sections, designed to help you assess how well you've mastered the learning outcome covered in the section you've just read.

✓ Check your understanding in the Pearson etext

When you click on the Check Your Understanding link, a multiple-choice quiz pops up. You can type answers to the questions, and after submitting your responses, you'll receive feedback on questions you've answered correctly, questions you've answered incorrectly, and rationales for the correct and incorrect answers.

Practice Using What You Have Learned

At the end of each chapter, you can complete application exercises in the interactive feature entitled Practice Using What You Have Learned. These scaffolded analysis exercises challenge you to use chapter content to reflect on development and learning in a variety of contexts. The questions you answer in these exercises are usually open ended. Once you provide your own answers to these questions, you'll receive feedback in the form of model answers written by experts.



Ten-year-old Daniel describes what makes him and other children his age happy, sad, or angry. Listen to his ideas about self-regulation of emotions.

PRACTICE USING WHAT YOU HAVE LEARNED

To access and complete the exercises, click the play buttons on the images below.

Observing Child Development



The Shape and Timing of Development



SUPPLEMENTS

This second edition of *Child and Adolescent Development* boasts of several useful and well-developed supplements created for instructors to help maximize the time and opportunity needed to develop a syllabus and thoroughly prepare for course instruction. The following resources are available for instructors to download from www.pearsonhighered.com/educator. Enter the author, title of the text, or the ISBN number, then select this text, and click on the “Resources” tab. Download the supplement you need. If you require assistance in downloading any resources, contact your Pearson representative.

INSTRUCTOR’S MANUAL. An *Instructor’s Manual*, available electronically, provides ideas and strategies that explore core developmental themes; presents developmental characteristics and milestones; identifies the diversity in global, developmental perspectives; and offers critical discussion topics. This manual includes activities and strategies designed to help prospective teachers—and others seeking a career working with children or adolescents—to apply the developmental concepts and strategies they have learned.

POWERPOINT SLIDES. PowerPoint slides include chapter objectives, key concepts, summaries of content, and graphic aids, each designed to support class lectures and help students organize, synthesize, and remember core content.

TEST BANK. Built from the course objectives, the test bank questions offer both lower level questions that ask students to identify or explain concepts, principles, and theories about development and higher level questions that will require students to apply concepts, principles, and theories to student behavior and teaching strategies.

ACKNOWLEDGMENTS

During the years we worked on this book, many people supported the project. Without their help, this text simply could not have been written.

Donna Wittmer, an expert on infancy, drafted Chapters 3 and 4 for the first edition of this text. We appreciate her expertise and energy in providing that content. We are honored to have her knowledge reflected in our book.

In this new edition, Lauren Bailes of The Ohio State University drafted the *Policy and Child Well-Being* boxes and *Guidelines* for Chapters 1, 2, 3, 6, 9, 11, and 12. Stephanie Ang and Nicole Fusaro of The University of British Columbia drafted these features for Chapters 4, 5, 7, 8, 10, and 13. Also thanks to Stephanie Ang, Rebecca Collie, and Nikki Yee for their help with creating and adapting tables, figures, and Connecting with Children Guidelines.

As we developed and revised this book, we benefited from the ideas of professors around the country who took the time to complete surveys, review chapters, and answer questions. Thanks to:

Beverly Alford, Texas A&M University; Audrey Ambrosino, Georgia State University; Katherine Bender, Old Dominion University; Robbie Fattal, California State University-Fresno; Vivien Geneser, Texas A&M University; Lydia Grosso, California State University-Long Beach; Ellen Hamm, Canisius College; Lula Henry, Lamar University; Tywanda Jiles, Governors State University; Susan Johnson, Mercyhurst University; Jeffrey Liew, Texas A&M University; Suzanne Little, Central Washington University; Winnie Mucherah, Ball State University; Michelle Tichy, University of Northern Iowa; Stephen Trotter, Tennessee State University; and Sandra Twardosz, University of Tennessee – Knoxville.

Child development professionals and teachers across the country and around the world contributed their experience, creativity, and expertise to the *Casebook: What Would You Do?* We have thoroughly enjoyed our association with these experts, and are grateful for the perspective they brought to the book:

Carol Apple, Hillsborough County School District, Tampa, FL; Cathy Blanchfield, Duncan Polytechnical High School, Fresno, CA; Amanda Bosdeck, West De Pere Middle School, De Pere, WI; Katie Burger, Washington Park Elementary School, Laurinburg, NC; Sarah Davlin,

Wyandot Run Elementary School, Powell, OH; Karen E. Davies, North Royalton Early Childhood Center, Broadview Heights, OH; Lou De Lauro, John P. Faber School, Dunellen, NJ; Holly Fitchette, Fleming Island High School, Fleming Island, FL; Chris Fraser, MSW, LISW, Columbus, OH; Jennie Geartz-Ott, University of Chicago Medicine - Comer Children's Hospital, Chicago, IL; Arlene Brett Gordon, PhD, LMFT, Nova Southeastern University, Fort Lauderdale, FL; Sarah Graff, California State University, Monterey Bay, Seaside, CA; Julie Hansen, MSW, LICSW, Children's Hospital Boston, Boston, MA; Elizabeth Kennard, MD, The Ohio State University, Columbus, OH; Susan Kiley, Boston University, Boston, MA; Misty Lay, Bullitt County Public Schools, Shepherdsville, KY; Jade Evette Muñoz, Texas A&M University, Corpus Christi, Corpus Christi, TX; Tracy MacDonald, Chesapeake Bay Middle School, Pasadena, MD; Madeline Murphy, Erikson Institute, Chicago, IL; Melissa Murray, City of Palo Alto, Palo Alto, CA; Judy S. Pieper, Holy Trinity Junior High, Newport, KY; Jason Sherlock, Bayard Rustin High School, West Chester, PA; Gina Stocks, Sul Ross State University—Rio Grande College, Uvalde, TX; Jill Sullivan, Northside College Prep High School, Chicago, IL; Alyssa Vogt, University of Wisconsin, Madison, Madison, WI; Emily Waler, Ohio University, Athens, OH; Kami M. Wagner, Mt. Hebron High School, Ellicott City, MD; Judy Welch, MD, Family Practitioner, Westbrook, ME; Debbie Wilson, RN, Lancaster City Schools, Lancaster, OH; Katherine A. Young, Montgomery County Intermediate Unit, Non-Public School Services Division, Norristown, PA; and Vicky Zygouris-Coe, PhD, University of Central Florida, Orlando, FL.

In a project of this size, so many people make essential contributions. We are honored to work with such a talented and creative group.

We were also fortunate to have excellent graduate assistants to dig up sources and resources, sometimes from the basements of libraries; create and adapt tables and figures; draft policy boxes; and compile the massive list of references. Thanks, in particular, to Lauren Bailes and Rebecca Collie for their support for this edition.

Finally, we want to thank our family and friends for their kindness and support during the long days and nights that we worked on this book.

To Anita's family, Marion, Bob, Eric, Suzie, Lizzie, Wayne K., Marie, Kelly, and Amaya—you are the greatest. And to Wayne Hoy, my friend, colleague, inspiration, passion, husband—you make every day a gift.

Thanks to Nancy's family, Elsie, Muriel, Doug, Corita, Gillian, Harv, and Lucy—for your support and patience through all the weekends and holidays I was writing “the book.” Most special thanks go to Phil—my partner in life.

ANITA WOOLFOLK HOY, Naples, Florida

NANCY PERRY, British Columbia, Canada

1 | INTRODUCTION: DIMENSIONS OF DEVELOPMENT

THE CASEBOOK

WHAT WOULD YOU DO? APPLYING YOUR KNOWLEDGE OF CHILD DEVELOPMENT

Every chapter in this text will begin with a case involving child development. The issues raised and problems posed will relate to the information in the chapter that follows. But in this chapter, the focus of the case is very specific: you. Why are you taking this class, and what will you do with the knowledge you gain? Do you plan a career in child development? Which one? How will you decide? Should you consider being a teacher, social worker, physician, child life specialist, speech therapist, psychologist, researcher, nutritionist, pediatric or neonatal nurse, recreational or camp director, children's minister, college professor, public policy analyst, or . . .? Are you now or will you ever be a parent, aunt, uncle, foster parent,

guardian, voter, or . . .? If the answer to any of these questions is "yes" or even "maybe," then you need to think critically about what this class means for your future.

CRITICAL THINKING

Throughout the text, you'll see reflective questions at the start of each chapter following the **Casebook: What Would You Do**. Think critically about these questions before you begin to study the material, and return to them after you've completed reading the chapter.

Learn more about becoming a critical thinker in your Pearson etext.

- What experiences have you had with children?
- Which careers or roles involving children fit best with your talents, experiences, dispositions, and abilities?
- What is your final educational goal: Associate degree? Bachelor's degree? Master's? Doctorate?



OVERVIEW AND OBJECTIVES

Welcome to the remarkable world of children caught in the act of becoming. For the next several hundred pages, we will explore how children develop—and we will encounter some surprising situations.

- Ethan, a 3-year-old, confidently predicts that there will be “candy” in a big, red, heart-shaped candy box; when he sees that the box actually contains pencils, he claims that he always knew there were pencils in the box, and that his friend Jacob, who has never seen the candy box before, would also know this.
- Eight-month-old Liam cries when a toy is hidden under a cloth right before his eyes and does not search for the toy, but 19-month-old Eva can search for a hidden block, even when it is hidden under either one of two cloths.
- A young girl who once said her *feet* hurt suddenly begins to refer to her *foots* hurting, and then describes her *footses* before she finally returns to talking about her *feet*.
- Elizabeth, a 4-year-old, watches as her mother flips through the channels on the TV. Elizabeth insists she wants to watch one channel on the TV, then another, then the first one, then the other—all at the same time.
- Leah, a 5-year-old, is certain that rolling out a ball of clay into a snake makes more clay.
- A 9-year-old child in Geneva, Switzerland, is asked, “What is your nationality?”—*I am Swiss.*—“How come?”—*Because I live in Switzerland.*—“Are you also a Genevan?”—*No, that’s not possible. I’m already Swiss, I can’t also be Genevan.*
- Jamal, a very bright elementary school student, cannot answer the question, “How would life be different if there were no darkness at night?” because he insists, “It IS DARK at night!”
- A 2-year-old who brings his own mother to comfort a friend who is crying (even though the friend’s mother is available too) becomes an adolescent who buys that friend a gift—mix of songs by a rapper he hates, but that his friend really likes.

What explanations are there for these interesting beliefs and behaviors? You will soon find out, because you also are entering the world of child development. By the time you finish this chapter you should be able to:

- Objective 1.1 Describe the field of child development and compare it to the science of developmental psychology.
- Objective 1.2 Explain four broad time periods in the development of children, including the social expectations about what children can do at each period and the broad areas of development within each period.

Objective 1.3 Discuss three key and constant questions in child development involving the shape, timing, and sources of development, and explain how these questions are answered today.

Objective 1.4 Discuss how family, ethnicity, social class, social policies, and historical time periods provide contexts for child development.

Objective 1.5 Decide how to apply the knowledge you have gained about child development.

WHAT IS CHILD DEVELOPMENT?

The term **development** in its most general sense refers to patterns of growth and change that occur in human beings (or animals) between conception and death. The patterns and change often involve greater complexity—the 3-month-old who stops following an object when it moves out of sight becomes an 8-year-old who can read a map and then a 16-year-old who can understand theories of geometry (Thelen & Corbetta, 2009; Thelen & Smith, 1998). Development is not applied to all changes, but rather to those that appear in orderly ways and remain for a reasonably long period of time. A temporary change caused by a brief illness, for example, is not considered a part of development. Even a more permanent change such as altering your appearance through plastic surgery is not development. A more technical definition is “a developmental theory describes changes over time in one or several areas of behavior or psychological activity such as thought, language, social behavior, or perception” (Miller, 2011, p. 8). So the study of child development is the study of predictable patterns of change in children over time.

Both the content of the change (e.g., the child saying *feet*, then *foots*, then *footes*, then *feet* to refer to the plural of *foot*) and the processes (how children figure out the rules and exceptions in language) are part of the study of child development. Thus two important questions are: *What* changes? and *How* do the changes occur? A third important question is constancy: What does *not* change, and why? Miller’s definition tells us that the how and why questions about change are examined by considering biological and environmental factors *in continuous interaction*.

Now, let’s get more specific. Developmental scientists approach the study of change/constancy and biology/environment in a systematic, scientific manner.

The Science of Child Development

Like so many other areas of study today, **child development** is a subfield of a larger category, **developmental science**. Developmental scientists are interested in human growth and change from conception until death, often called *lifespan development*. Those studying child development focus on the period from conception through adolescence, roughly the time from 0 to about 20 years old—the span covered by this book. Of course, people continue to develop after adolescence. The more we learn about adult development, the more we realize that it is impossible to disconnect child development from adult development. For example, abusive parents often were abused as children, and their children are more likely to continue the cycle of abuse. Still, our focus will be on the developing child, with attention to all the influences along the way, including adults.

People always have been interested in children. In the 1800s and 1900s, the systematic study of child development began with the “baby biographies.” These biographies first appeared in Germany around the end of the 1700s. The author, usually a close relative, would keep a detailed journal, recording everything about the baby’s growth and development. Often these baby biographies were written by mothers and published as guidance for parents and teachers. For example, in the United States, Dr. Millicent Washburn Shinn wrote four volumes, published between 1893 and 1898, called *Notes of the Development of a Child*. She condensed the four volumes into a popular version called *Biography of a Baby*, published in 1900. Dr. Shinn—quoted by David Noon (2004, p. 111)—believed that “It is hard to get statistics about babies,

OUTLINE

The Casebook—Applying Your Knowledge of Child Development: What Would You Do?

Overview and Objectives

What Is Child Development?

Organizing Child Development: Periods and Areas

Basic Themes and Debates in Development

What Are the Contexts for Development?

Why Study Development?

Summary and Key Terms

The Casebook—Applying Your Knowledge of Child Development: What Would They Do?

scattered as they are, one by one, in different homes, not massed in schoolrooms . . . the most fruitful method so far has been the biographical one—that of watching one baby’s development, day by day, and recording it.”

Most baby biographies lacked the more sophisticated research methods described in Chapter 2 of this book, and, of course, the authors were emotionally connected to their “subjects.” But some of the early biographers were more systematic and scientific in their writings. For example, Charles Darwin (1877), the author of the theory of evolution, studied his own son’s first two years of development with the care that he brought to his other scientific observations. Darwin thought that studying how an individual developed might provide insights about how a species develops. In fact, Darwin did use these observations to write a very important essay on the expression of emotions (Rochat, 2001).

As you can see, the *scientific study* of children is relatively recent—a bit over 100 years old (Cairns & Cairns, 2006). What is meant by scientific study? Volumes have been written on this question, but the simple answer is that scientific study involves asking carefully specified questions based on current understandings (theories); systematically gathering and analyzing all kinds of information (data) about the questions; modifying and improving explanatory theories based on the results of those analyses; and then asking new questions based on the improved theories. We will examine this research cycle more closely in Chapter 2, because research in many different forms is the basis for our knowledge about how children develop.

Theory and Child Development

Theory is very important in scientific study. It is both the *basis* for initial questions and the *outcome* of the questioning process—the beginning and the end of the research cycle. The common sense notion of *theory* (as in “Oh well, it was only a theory”) is “a guess or hunch.” But the scientific meaning of *theory* is quite different. “A **theory** in science is an interrelated set of concepts that is used to explain a body of data and to make predictions . . .” (Stanovich, 1992, p. 21). The overriding purpose of theories is to explain phenomena, to tell us why things happened and what will happen in the future (Green & Piel, 2010).

Developmental scientists have constructed explanations for the relationships among many variables and even whole systems of relationships. There are theories to explain how language develops, how differences in intelligence occur, and how people learn. There are *grand theories*, such as those of Piaget, Vygotsky, or Bronfenbrenner (see Chapter 2), that provide comprehensive explanations for many different aspects of a child’s development—thinking, problem solving, language, social skills, and so on. There are smaller theories that focus on just one domain such as vocabulary development or self-concept. Today, because many different disciplines—from anthropology to zoology—are interested in understanding children, there are emerging theories that combine insights from many fields of research (Hartup, 2002; Salkind, 2004).

Science, then, is a process that allows us to gather and organize information into large and small theories to better understand the development of children. But few theories explain and predict perfectly. In this book, you will see many examples of people taking different theoretical positions and disagreeing on the overall explanations of such processes as the development of reasoning or the origins of self-concept. Because no one theory offers all the answers, it makes sense to consider what each has to offer.

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ORGANIZING CHILD DEVELOPMENT: PERIODS AND AREAS

Even though children are whole and complex beings, in order to study their development, we use some common categories and organize our discussion of development by time periods and specific areas.

Periods of Development: Infancy, Childhood, and Adolescence

You may have noticed that this book is organized by periods of development—*beginnings* (which includes prenatal development, infants, and toddlers), *early childhood*, *middle childhood*, and *adolescence*. These time period segments are commonly used to organize discussions of child development

because they tend to be characterized by particular patterns of limitations and growing capabilities. Also, each time period is associated with different *environments* for development and changing social *expectations*. For example, as infants mature and move into the period of early childhood, they often are in new environments outside their homes such as preschool or kindergarten, and they are expected to assume more and more responsibility for their own care—feeding themselves, toilet-learning, getting along with other children, and so on.

Before we examine these periods, a caveat is in order. These periods make some sense and are convenient organizers, but they do not represent some kind of biological imperative. Dividing the years from birth to adulthood into time periods is a **social construction**—a generally agreed upon set of categories based not so much on age but more on functional changes—what children can do and are expected to do. But all these periods have fuzzy boundaries and are affected by culture. In some cultures, for example, childhood ends much earlier as 12- or 13-year-olds work full time, marry, and start families. In the 1800s in many countries, including the United States and Canada, schooling ended and children entered the adult world before they were 13 years old, as they still do today in some cultures such as the Amish, who generally leave school after the eighth grade. So as we examine the periods, remember that these distinctions reflect **postindustrial**, technological cultural experiences and are not hard and fast categories. Here are the periods we will examine:

1. *Prenatal, Infancy, and Toddlerhood*. The **prenatal** period is the time between conception and birth, typically 38 weeks, though some children are born earlier and survive, as we will see in Chapter 3. In many ways, this is the time of greatest change. We go from being a single cell into a complex human being with ears, eyes, hands, feet, heart, lungs, digestive system, brain, and the capacity for lifelong development and learning. The first two years after birth also bring dramatic changes. Children progress from being infants who need care to survive to becoming toddlers who can crawl, then walk; babble, then talk; and interact with family to form social bonds. The new environment for the infant is the world outside the womb, but mostly the family. The new expectations are for gradually developing skills in the physical (particularly walking), cognitive (particularly language), and social/emotional arenas. We explore these accomplishments in Chapter 4.

2. *Early Childhood*. As children become fully able to form and use symbols such as language, they move to the next period of early childhood. The young child's physical and cognitive capabilities expand rapidly. At 2, children are walking, but by 6 most have added running, skipping, jumping, climbing, drawing, writing, and even swimming or other sports. Their vocabulary explodes from a few words to thousands. Their environments usually expand beyond family and home to include the neighborhood and caregivers outside the family such as nursery school, preschool, or kindergarten teachers. With growing physical and cognitive skills and new environments come new expectations for self-sufficiency and social competence. Children are expected to do many things for themselves and to get along with others—both children and adults—as you will see in Chapters 5, 6, and 7.

3. *Middle Childhood*. From ages 6 or 7 to 11, most children in postindustrial cultures are in the world of school. Their developing brains, language, and self-control allow them to learn reading, writing, arithmetic, science, history, and many other subjects. They can play organized games and sports, form and abandon friendships, and understand more abstract concepts such as intention and morality. Standards for achievement both in school and outside escalate, and children are expected to be more independent, keeping up with schoolwork and perhaps even caring for younger members of their family. We meet children in the middle years in Chapters 8, 9, and 10.

4. *Adolescence*. The transition to adolescence is marked by the physical and psychosocial changes of puberty. Somewhere between ages 10 and 12 or so, most children in postindustrial countries experience the dramatic development of sexual maturity. Everything changes. In addition to physical changes, there are growing cognitive capabilities to think abstractly, leading to greater idealism and the ability to handle more advanced abstract learning. The new environment is the world of peers, high school, work, and even college for some, because adolescence continues until ages 18 to 22 years or so. Adolescents are expected to move toward an independent identity and deal with their changing bodies, particularly sexual development. As with all the periods of development described here, the edges of adolescence are fuzzy. Some adolescents have taken on adult responsibilities for work and family at 18; others will not do so for several more years, as you will see in Chapters 11, 12, and 13.



The preschoolers in Ms. Joanie's class are observing tadpoles day by day as they grow legs, lose their tails, and develop into frogs. Notice how the teacher guides the students in their cognitive and social development during this activity.



In the first part of the video, a boy in middle childhood talks about the things persons his age like to do, what makes them happy, and what makes them angry. In the second part of the video, an adolescent boy talks about the same topic. As you watch, compare their levels of emotional development by contrasting their responses.

Of course, as we mentioned earlier, development does not stop with adolescence. Today there is increased study of adults and an emphasis on lifespan development. But that is another story and another book.

What Develops? Domains of Development

Child development can be divided into a number of different aspects based on what is developing. **Physical development**, as you might guess, deals with changes in the body and brain. So the study of physical development includes such topics as health; growth and change in bones and muscles that affect size, movement, and strength; and changes in sensory capabilities such as seeing and hearing. **Cognitive development** refers to changes in problem solving, memory, language, reasoning, and other aspects of thinking. **Emotional/social development** is the term generally used for changes in the individual's feelings, personality, self-concept, and relations with other people. After we consider infancy and toddlerhood in Chapter 4, there is one chapter on each of these three domains for every period of development covered in this book—early childhood, middle childhood, and adolescence. Table 1.1 lists the different periods of development along with example questions addressed in each domain of development for that period.

Another caveat is in order. We discuss physical, cognitive, and emotional/social development in separate chapters for each time period, but these domains are not separate in children. Having problems hearing (physical) will affect language development and reading (cognitive), as well as relationships with friends (social). So even though we discuss these domains of development separately, we know that development in one domain affects and is affected by development in the other two areas.

Many changes during development are strongly influenced by growth and **maturation**. Maturation refers to changes that occur naturally and spontaneously and that are, to a large extent, genetically based. Such changes emerge over time and are relatively unaffected by environment,

TABLE 1.1 • Periods and Domains of Development: Examples of Key Questions

PERIODS OF DEVELOPMENT	PHYSICAL DOMAIN	COGNITIVE DOMAIN	EMOTIONAL/SOCIAL
Prenatal (Conception to birth)	If a woman drinks coffee while she is pregnant, will it affect her baby? (Chapter 3)	Will playing music to babies before birth improve their cognitive abilities? (Chapter 3)	How does a mother's stress during pregnancy affect her baby? (Chapter 3)
Infancy (Birth to 2 years old)	If a baby is not walking at 18 months, is that a problem? (Chapter 4)	Can infants learn two languages? (Chapter 4)	If a child starts daycare at 3 months old, will that affect the emotional bonds between parents and the child? (Chapter 4)
Early Childhood (2 to 6 years old)	Is it a problem if a 5-year-old is "overweight"? (Chapter 5)	Should some children be "held back" in kindergarten? (Chapter 6)	Is it normal for a 5-year-old to be afraid of a Halloween mask? (Chapter 7)
Middle Childhood (6 to 11 years old)	What are the common diseases of childhood? (Chapter 8)	What does an IQ score tell you about a 7-year-old? (Chapter 9)	Why are some children victims and others bullies? (Chapter 10)
Adolescence (11 to 20+ years old)	What are the consequences of going through puberty late for boys? For girls? (Chapter 11)	Are there gender differences in mathematics abilities? (Chapter 12)	What factors influence racial identity? (Chapter 13)

except in cases of malnutrition or severe illness (Overton, 2006). Much of a person's physical development falls into this category.

So far, we have examined the periods and domains of development. There also are some fundamental themes and issues in explanations of development that will arise throughout this text. We turn to those now.

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BASIC THEMES AND DEBATES IN DEVELOPMENT

Along with the many different approaches to research and theory in child development, there are continuing debates about some key questions. After considering some early themes about children, we will look at three more current debates: What is the shape of development—is it continuous or are there leaps and distinct stages? How important is timing in development—are there critical periods when certain abilities must emerge or they will be forever lost? Which is the more influential source of development—personal characteristics or the environment? After considering these three issues, we will examine some emerging ideas in child development.

Early Themes

MINIATURE ADULTS? You may have read in other classes that during medieval times, children were viewed as miniature adults without special needs. One line of reasoning claims that as soon as they could walk, talk, and care for themselves (about age 8 or so), children were considered small adults. Children worked and dressed like their parents. If they broke the law, children could receive the same punishments as adults, including hanging (E. Jaffe, 1997). Evidence for this view of medieval childhood comes from paintings showing children dressed as adults. But scholars studying the lives of medieval children have questioned these assumptions (Hanawalt, 1993; Orme, 2001). These historians believe that even though adolescence was not really recognized as a separate phase in medieval times, childhood was considered a special and vulnerable stage of life. For example, there were laws that protected children and medicines for children were different from those given to adults.

By the way, it has taken quite a while to provide full legal protection for children. For example, the United States tried several times during the early 1900s to limit the hours a young child could work, but it was 1938 before federal laws specified the minimum ages and maximum hours allowed.

INNATELY GOOD? ACTIVE OR PASSIVE? Following medieval times, conceptions of the nature of children continued to reflect religious and philosophical thinking. In the 1500s, the Puritans' idea of original sin assumed that children were born evil and should be educated and disciplined to overcome this perilous beginning. Training for some Puritan parents included harsh methods, but for others, persuasion and reason were the preferred approaches (Clarke-Stewart, 1998).

In the 1600s, John Locke, a British philosopher, presented a different idea. Rather than perceiving children as innately bad, Locke contended that they are blank slates (*tabula rasa* in Latin) on which the world “writes” knowledge and beliefs. Through education, nurture, training, correction, tutoring, and so on, the world molds the adult from the clay of childhood. Locke saw children as passive—neither evil nor active in shaping their own development (Locke, 1690/1892). He also saw a central role for parents in shaping their children's character and thinking. Locke often is quoted as observing, “Parents wonder why the streams are bitter, when they themselves have poisoned the fountain.” *Behaviorism* (discussed in the next chapter) traces some of its historical roots to Locke's ideas, particularly his notion that intelligent behavior results from forming *associations* between experiences or stimulation on one hand and ideas or thoughts on the other hand. Thus Locke emphasized the importance of planned experiences and interventions in children's development.

By the 1700s, a new idea emerged. Jean-Jacques Rousseau rejected the views of children as evil or as neutral blank slates. He proposed that children are inherently good—*noble savages*—who have a built-in sense of right and wrong. Rousseau believed that if children were left alone to develop without adult training they would naturally mature from infants to children to adolescents to

adults (1762/1979). Thus his philosophy was completely child-centered—the interests and needs of children should guide adults at each stage of the child’s development. Rousseau believed children develop naturally through different stages and different forms of education may be important for each stage. Thus Rousseau emphasized the idea of natural maturation in children’s development, unfolding through a series of stages.

Now we turn to the contemporary study of children. The first *Handbook of Child Psychology* was edited by Carl Murchison in 1991. Reflecting on all the *Handbook* editions since then in the preface of the 2006 edition, William Damon notes, “The perennial themes of the field were there from the start” (p. xiii). Damon goes on to describe debating nature versus nurture as the source of development, disagreeing about whether development unfolds similarly for all children or whether contexts are powerful influences, discussing continuity versus discontinuity in the shaping of development, and separating the analysis of development into different aspects (biological, cognitive, social, emotional) while insisting that these processes cannot be separated when it comes to the “dynamic mix of human development.” Let’s examine a few of these key themes.

What Is the Shape of Development? Continuity vs. Discontinuity

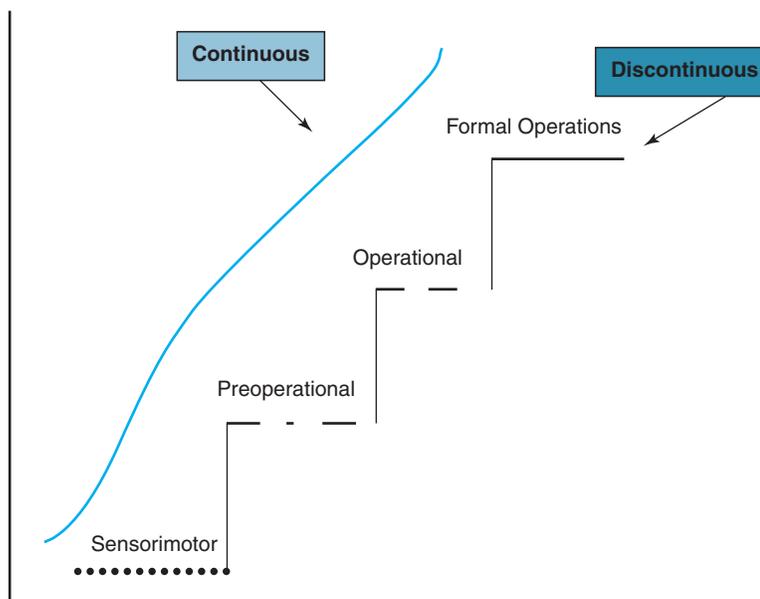
Is human development a continuous process of adding to and increasing abilities, or are there leaps or moves to new stages with completely new abilities? A **continuous development** process would be like gradual improvement in your running endurance through systematic exercise. A **discontinuous development** change would be like a tadpole becoming a frog—the frog developed from the tadpole, but the frog is not simply a bigger tadpole—not just “more of the same” tadpole. The tadpole-to-frog change has been called *qualitative* because the animal changes in its qualities (e.g., legs appear). Qualitative changes contrast with purely *quantitative* change, such as the frog growing longer or heavier.

You can think of continuous or quantitative change like walking up a ramp to go higher and higher. Progress is steady, as you can see in Figure 1.1. A discontinuous or qualitative change is more like walking up stairs—there are level periods, then you move up to the next step all at once.

FIGURE 1.1

CONTINUOUS AND DISCONTINUOUS CHANGE

Piaget’s theory describing four qualitatively different stages of children’s thinking is an example of discontinuous change.



The best examples of discontinuous or qualitative change in child development are stage theories, such as Jean Piaget's theory of cognitive development that describe qualitative changes. In Piaget's (1970a, 1971) theory, the thinking of the child changes in ways that involve more than just the addition of knowledge and skills. For example, young babies seem to lack object permanence—when a toy is “out of sight” it is “out of mind.” The baby doesn't search for the toy. Young children at the preoperational stage may think that they will some day catch up to a sibling in age, or they may confuse the past and the future. But children at the next stage, operational, have no such confusions. According to Piaget's stage theory, all the explanation and practice in the world will not help a child functioning at one stage to understand the ways of thinking at a higher stage. In the next chapter we will look more closely at the stage theories of Piaget, Freud, and Erikson.

Besides continuous and discontinuous change, there is a third possibility. Changes may seem like discontinuous, qualitative leaps when we look across longer time periods. But if we watch the developing child very closely moment-to-moment or hour-to-hour, we might see the gradual, continuous changes. Rather than arising all at once, for example, the knowledge that a hidden toy still exists may evolve gradually as children's memories develop. The longer you make the infants wait before searching—the longer you make them remember the object—the older they have to be to succeed, so there is some evidence for this third possibility of gradual evolution (Siegler & Alibali, 2005).

The opposite is also possible. Developments that seem quantitative may actually be based on qualitative changes. For example, when a 7-year-old can remember twice as many objects as a 4-year-old, that seems like a quantitative difference. But the 7-year-old may be using strategies to remember—a qualitatively different memory method than that employed by the 4-year-old, who likely is just “trying hard” to remember (Miller, 2011).

So change can be both continuous and discontinuous, as described by a branch of mathematics called *catastrophe theory*. Changes that appear suddenly, such as the collapse of a bridge, are preceded by many slowly developing changes such as gradual, continuous corrosion of the metal structures. Similarly, gradually developing changes in children, such as learning to use memory strategies, can lead to large changes in abilities that seem abrupt (K. W. Fischer & Pare-Blagoev, 2000; Siegler & Alibali, 2005).



Children of different ages wrestle with a question involving conservation: Do the two glasses contain the same amount of juice? As you watch the younger and older child answer the question, consider whether their cognitive development illustrates continuous or discontinuous change.

Timing: Is It Too Late? Critical Periods and Earlier vs. Later Experiences

Are some experiences, such as exposure to toxic drugs or improved nutrition, more powerful at certain times than others? Are there **critical periods** when certain abilities, such as language, need to develop? If those opportunities are missed, can the child still “catch up”? These are questions about timing and development.

In answer to the first question, as you will see in Chapter 3, there are critical times in prenatal development when exposure to a toxin or a disease afflicting the mother, such as rubella, will cause damage to the developing fetus. But the same exposure earlier or later in the pregnancy would have minimal effects. So, what about developing abilities after the child is born? There appears to be a critical period for learning accurate language pronunciation. The earlier people learn a second language, the more their pronunciation is nearly native. After adolescence it is difficult to learn a new language without speaking with an accent (Piske, MacKay, & Flege, 2001).

Does the critical period for developing near-native pronunciation extend to learning language itself? Years ago, Eric Lenneberg (1969) proposed that the time from infancy to puberty is the critical period for language development. If somehow a child were kept from developing language during that time, Lenneberg believed, then language would never develop. You can imagine that this is a difficult theory to test. It would be highly unethical, in fact criminal, to perform an experiment that would keep an infant from the chance to develop language. But in 1970, outside Los Angeles, authorities discovered a 13-year old-girl who had been kept in a tiny room, tied to a potty chair, and cut off from all human contact by her mentally ill father. She seemed to recognize her name, but did not speak. Would her experiences point to the existence of a critical period for language?

Funded by grants from the National Institute of Mental Health (NIMH), several researchers took over the care of “Genie,” a name they gave her for reporting purposes. After a few years of

intensive care and language teaching, Genie could use several words and say some simple sentences, but her language never became normal. When the funding ran out and Genie lived in a series of foster homes, she returned to complete silence. Genie's experiences seem to lend some support for the critical period theory. But it is also possible that the serious abuse she endured caused so much cognitive and emotional damage that language development was almost impossible.

Some critical periods for development appear to depend on the **plasticity** (adaptability or modifiability) of brain organization and structures. For example, we know that the left side of the brain is more involved in language processing for most people. But this specialization of the two sides of the brain takes a while to develop. Therefore, the brains of young children show more plasticity because they are not as specialized as the brains of older children and adults. Damage to the left side of a young child's brain can be somewhat overcome to allow language development to proceed. Other areas of the brain take over this task. But this compensation is less likely for older children and adults.

Many earlier developmental psychologists, particularly those influenced by Freud, believed that early childhood experiences were critical, especially for emotional/social and cognitive development. But does early "toilet teaching" really set all of us on a particular life path? Probably not. More recent research shows that later experiences are powerful, too, and can change the direction of development (Kagan & Herschkowitz, 2005). Most developmental psychologists today talk about **sensitive periods**—not critical periods. These are times when a person is especially ready for or responsive to certain experiences. Thus, although the best time to learn a second language on your own without direct instruction is childhood, adults can and do learn second languages all the time.

What Is the Source of Development? Nature vs. Nurture

Which is more important in development, the "nature" of an individual (heredity, genes, biological processes, maturation, etc.) or the "nurture" of environmental contexts (education, parenting, culture, social policies, etc.)? This debate has raged for at least 2,000 years and has had many labels along the way—"heredity versus environment," "nativism versus empiricism," "biology versus culture," "maturation versus learning," and "innate versus acquired abilities" (Cairns & Cairns, 2006; Miller, 2011). In earlier centuries, philosophers, poets, religious leaders, and politicians argued the question. Today scientists bring new tools to the discussion as they can map genes or trace the effects of drugs on brain activity, for example (Gottlieb, Wahlsten, & Lickliter, 2006).

If we look at the history of scientific explanations for development, we see that the pendulum has swung back and forth between nature and nurture (Cairns & Cairns, 2006; Lerner, Theokas, & Bobek, 2005). For an example of the differing views, see the *Point/Counterpoint* on the next page.

Today the environment is viewed as critical for development (more about this in the next section on contexts), but biological factors and individual differences are important, too. In fact, some scientists assert that behaviors are determined 100% by biology *and* 100% by environment—they can't be separated (Miller, 2011). Even with recent advances in mapping human genes, we still need to consider complex interactions with life experiences. Gilbert Gottlieb (2003) sums it up: "gene-environment coactions are the rule in developmental investigations" (p. 352).

Emerging Ideas

As you might imagine, the preceding debates proved too complicated to be settled by splitting alternatives into either/or possibilities (Griffins & Gray, 2005).

BEWARE OF EITHER/OR. Richard Lerner and his colleagues (2005) summed up the problems with either/or thinking:

In human development, major instances of such splitting involved classic debates about nature versus nurture as "the" source of development, continuity versus discontinuity as an appropriate depiction of the character of the human development trajectory, and stability versus instability as an adequate means to describe development change. Today, most major developmental theories eschew such splits and use concepts drawn from developmental systems theories (e.g., Lerner, 2002; Overton, 1998, 2003). (p. 3)

POINT/COUNTERPOINT

Are Numbers Innate or Learned?

Throughout this text we will be examining some debates in child development. We will look at the arguments for both sides, so this feature is called *Point/Counterpoint*. Here is the first one.

What seems like a simple notion, that 3 cups in a stack is the same number as 3 birds on a telephone wire, is not so simple. After all, the stacked cups and the lined-up birds look quite different. And what about counting? Different languages have very different ways of saying 17, for example. In English, 17 is “seventeen,” but in French it is “dix-sept” or 10 - 7. Some psychologists claim that this whole process is easier because an understanding of number is innate—we are born with it. Others believe that we have to learn the meaning of numbers. Let’s look at the arguments. After you read these positions, you might listen to a podcast on innate numbers from *Radiolab* (wnyc.org/shows/radiolab/episodes/2009/10/09/segments/137633).

POINT

WE ARE BORN WITH A SENSE OF NUMBERS

The idea that people are predisposed to understand numbers comes mostly from work with babies. In the 1980s, Rochel Gelman and her student Prentice Starkey used a technique called *habituation* to study infants’ understanding of number. In a typical experiment, babies are shown a series of 3 dots arranged in different ways—close together or farther apart. After a while, the babies usually habituate—their attention to the displays of dots decreases. But when a new display with just 2 dots appears, they look longer at it, indicating that the 2 dots is something new for them. This habituation to one number,

then renewed attention to a new number, doesn’t work, however, with larger numbers, say 4 or above. Based on these studies and others like it, Gelman and her colleagues (Gelman & Gallistel, 1978; Starkey, Spelke, & Gelman, 1990) concluded that humans must be born with a sense that 2 is different from 3; that is, babies have “a clear understanding of the number continuum, which they can apply at first only to small numbers but extend to larger numbers as they grow older and their cognitive powers and memory capacities increase” (P. Bryant & Nunes, 2004, p. 414).

COUNTERPOINT

WE NEED TO LEARN ABOUT NUMBERS

But are these experiments really about number? Other researchers claim that although these babies are detecting differences, they are not differences in number, just differences in the amount of “stuff” in the displays. To test this, researchers tried using 3 small dots in the first habituation phase, and then showed 3 larger dots in the checking phase. After habituating (growing uninterested) in the 3 dots, the babies increased their attention to the larger dots, even though the number was still 3. So it seemed that the babies were noticing greater size, not a change in number (Clearfield & Mix, 1999). Peter Bryant and Terezinha Nunes (2004) believe that basic mathematical ideas about numbers are not innate. “They are a source of genuine difficulty for children, and the idea that they come as an innate and universal gift is misguided and actually harmful, for it distracts us from giving help to children where they need it” (p. 349).

Developmental systems theories are general perspectives on development, heredity, and evolution that emphasize the study of *interactions and coactions* among the many influences on development, without falling into the kinds of “which is better” debates described in the previous sections (Lerner, 2006a). As you will see in the next chapter, these systems perspectives are leading explanations of development. So where does that leave us on the nature/nurture questions?

NATURE AND NURTURE TODAY. In Chapter 3 we examine heredity and environment closely, but for now we can say that current views emphasize complex **coactions** (joint actions) of nature and nurture. For example, a child born with a very easygoing, calm disposition will likely elicit different reactions from parents, playmates, and teachers compared to a child who is often upset and difficult to soothe, so individuals are active in constructing their own environments. But environments shape individuals as well—if not, what good would education be? So today, the either/or debates about nature and nurture are of less interest to developmental psychologists. The more exciting questions involve understanding how James Mark Baldwin, as a pioneer in developmental psychology, said over 100 years ago, “both causes work together” (1895, p. 77).

A special section in the journal *Developmental Psychology* on biology and environment (Diamond, 2009) included articles on how experience affects gene expression, how genes influence what effects environments have, and even how physical fitness affects cognition and the brain. The general public is beginning to understand that nature and nurture act together. A poll found that 90% of parents and teachers believed that genetics and environment are equally important factors for mental illness, intelligence, personality, and learning disabilities (Plomin, 2004).

Today, advanced research tools and technologies allow us to ask new questions about nature and nurture that reflect a developmental systems perspective, such as, “How do genes affect emotional development and how do those effects change over time?” An example is in the development of schizophrenia, a serious mental disorder that appears in adolescence. There is evidence that some genetic factors are involved in schizophrenia—it tends to run in families, and an identical twin has about a 45% chance of having the disorder if the other twin has schizophrenia. But if genes are involved, why do the behaviors often observed, such as hearing voices or having paranoid delusions, not occur in childhood, before adolescence? One answer is that the brain may have to mature enough to be capable of abstract thought before genes that underlie schizophrenic behaviors will have the effects we associate with the disorder—voices and delusions (Plomin, 2004).

Another example involves intelligence as assessed by IQ tests (see Chapter 12 for more on these tests). We might guess that the effects of the environment on IQ would increase as we grow and have more different experiences, but that does not seem to be the case. Genetic influences on IQ increase from infancy to adulthood—the relationship between parents’ IQs and their children’s IQs grows stronger over time—the opposite of what we might predict. One explanation is that as we go through life, we create environments, select experiences, and shape our contexts, so the environments we create are consistent with the genes and magnify the influence of the genes over time (Plomin, 2004).

The future of developmental research on the complex coactions of nature and nurture may well involve building on the work of the Human Genome Project (2008c) that has identified the 20,000 to 25,000 genes in human DNA and how these genes work collaboratively with other influences such as hormones to affect human development. As researchers understand gene–environment coactions to explain differences in development over time, we may be able to design more effective interventions for disorders such as schizophrenia or alcoholism.

A focus on coactions of biology and environment highlights the importance of contexts. No matter what, all scientists agree that the contexts in which children develop—their biological, physical, emotional, cultural, and social environments—are important considerations in development. We turn to those contexts next.

✓ Check your understanding in the Pearson etext

WHAT ARE THE CONTEXTS FOR DEVELOPMENT?

Developmental researchers are increasingly interested in the role of **context**. Context is the total setting or situation that surrounds and interacts with a person or event. As we learn more about the biology of development, it is clear that there are contextual effects both internal and external to the developing individual. For example, the child’s health is a context for developing organs, including the brain. In this book, however, we focus on the contexts outside the individual. These contexts may include family, neighborhood, school, economic conditions, cultural tools and traditions, social norms and processes, timing issues, architectural and environmental structures, emotional and physical climate, and historical factors—to name just a few (Lerner et al., 2005). As we will see in the next chapter, Uri Bronfenbrenner’s theory of development highlights these nested and interacting contexts for development (Bronfenbrenner & Morris, 2006).

Contexts affect how actions are interpreted. For example, when a stranger approaches a 7-month-old infant, the baby is likely to cry if the setting is unfamiliar, but not cry when the stranger approaches in the baby’s home. Adults are more likely to help a stranger in need in small

towns as opposed to larger cities (Kagan & Herschkowitz, 2005). Here is another example: Standing on your seat and screaming means one thing at a football game and another on an airplane. Think about a ringing telephone. Is it 3:00 in the afternoon or 3:00 a.m.? Did you just call someone and leave a message asking for a return call? Has the phone been ringing off the hook, or is this the first call in days? Did you just sit down to dinner? Are you engrossed in a conversation or bored and looking for an excuse to exit the discussion? The meaning of the phone ringing and the feelings you have will vary, depending on the context. In making a case for greater attention to context in developmental research, Jerome Kagan (2004), director of Harvard University's Infant and Child Study Center, said, "because humans evaluate every event with respect to the situation in which it normally occurs, every event must be conceptualized as an 'event in context'" (p. 293).

Contexts also influence the development of behaviors, beliefs, and knowledge by providing resources, supports, incentives and punishments, expectations, teachers, models, and tools—all the building blocks of development. Children do not develop in laboratories or isolation bubbles. They grow up in families and neighborhoods. They attend schools and are in classes, teams, or choirs. They are members of particular ethnic, religious, economic, and language communities. The social and educational programs and policies of their governments affect their lives. Moreover, the contexts in which we live and develop are incredibly diverse. For example, here are a few statistics about the United States and Canada (taken from Children's Defense Fund, 2008; Child Trends, 2013; Dewan, 2010; Freisen, 2010; Meece & Kurtz-Costes, 2001; U.S. Census Bureau, 2010a):

- In 2010, 13% of the people living in the United States were born outside of the United States, and 20% spoke a language other than English at home—about 60% of those families spoke Spanish.
- In 2010, 22% of children under the age of 18 are Latino. By 2050, Latinos will be about one quarter of the U.S. population (U.S. Census Bureau, 2010b).
- In Canada, projections are that by 2031, one in three Canadians will belong to a visible minority, with South Asians the largest group represented. About 17% of the population reported that their first language was not French or English, but instead one of over 100 languages (Freisen, 2010).
- In America, over 16 million children—about 22% of all children—live in poverty, defined in 2013 by the United States Department of Health and Human Services (as an income of \$23,550 for a family of four (\$29,440 in Alaska and \$27,090 in Hawaii). Of those over 16 million, over 7 million live in extreme poverty. The USA has the *second highest* rate of child poverty among the economically advantaged countries of the world—only Romania has a higher rate of child poverty. Iceland, the Scandinavian countries, Cyprus, and the Netherlands have the lowest rates of child poverty, about 7% or less (<http://aspe.hhs.gov/poverty/13poverty.cfm>; UNICEF, 2012b; U.S. Census Bureau, 2011).
- Child poverty rates are 25% or higher in 10 states, including Alabama, Arkansas, Louisiana, South Carolina, Tennessee, Texas, and West Virginia.
- Out of 100 graduates in the High School class of 2013, about 71 had experienced physical assault; 51 had used alcohol, cigarettes, or illicit drugs in the previous 30 days and 7 smoked marijuana every day; 48 were sexually active but only 27 used condoms the last time they had sex; 39 had been bullied physically or emotionally; 20 watched four hours or more of television every day; 17 were employed; 16 had carried a weapon in the previous year; 12 had ADHD; and 4 had an eating disorder.

In the next few pages we take a closer look at several influential interacting contexts for development.

Family

The first context for development is the mother's womb. As research advances in biology, biochemistry, neuroscience, and other fields, we learn more about the effects of this first environment, as you will see in Chapter 3. You will learn about the influence of the expectant mother's level of stress,



A high school teacher asks a group of immigrant students how being from a different culture makes them feel in the classroom. As you listen to the students, consider the influential interacting contexts for development – before and after they came to the United States and enrolled in schools in a U.S. community. Carefully consider their suggestions to teachers.

nutrition, smoking, alcohol and drug intake, exercise, general health, and even voice on her infant's development. The influence of the family begins before birth. After the baby is born, new family influences are added.

FAMILY STRUCTURE. You may have grown up in a **nuclear family**, defined as a mother and father (or a single parent) along with biological, adopted, or stepchildren living in the same household. Sometimes this unit is called a *traditional family* when it includes both parents, but it is not the family configuration for everyone. Some children are being raised by same-sex parents in a nuclear family structure. These children may be the biological offspring of one of the parents or they may be adopted. Increasingly, children today may be part of **blended families**, with stepbrothers or stepsisters who move in and out of their lives. Some children live with an aunt, with grandparents, with one parent, in foster or adoptive homes, or with an older brother or sister. In some cultures such as Asian, Latin American, or African, children are more likely to grow up in **extended families**, with grandparents, aunts, uncles, and cousins living in the same household or at least in daily contact with them. Childcare and economic support often are shared among family members. Family structure is determined in part by cultural customs and in part by economics and mobility. For example, family groups that move to take advantage of economic opportunities tend to be smaller—more nuclear and less extended (J. T. Peterson, 1993).

PARENTING STYLES. The family context affects child development in many ways, but one of the most widely researched influences is parent discipline style. One well-known description of **parenting styles** is based on the research of Diane Baumrind (1991a,b, 2005). Her early work focused on a careful longitudinal study of 100 (mostly European American, middle-class) preschool children. Through observation of children and parents and interviews with parents, Baumrind and the other researchers who built on her findings identified four styles based on two dimensions: (a) *warmth, acceptance of age-appropriate behaviors, and responsive communication* and (b) *control and demand for mature behavior*. This second dimension may seem harsh and damaging. But control in the form of structure, feedback, and *appropriate* high expectations can be positive for children's development. A general finding (Woolfolk & Perry, 2014) is that children from European American, middle-class families with authoritative (high warmth, high control/demand) parents are more likely to be happy with themselves and to relate well to others, whereas children with authoritarian parents (low warmth, high control/demand) are more likely to be guilty or depressed.

Cultures differ in parenting styles, as you can see in the *Relating to Every Child* discussion on the next page. The research on parenting styles makes it clear that all families are part of a culture, and that culture is a powerful context for development.

Peers: Friends and Others

Children also develop within peer groups. As you will see later in the book when we talk about social and emotional development at different ages, peers and friendships are central to children's lives. When there has been a falling-out or an argument, when rumors are started and pacts are made to ostracize someone, the results can be devastating. Beyond the immediate trauma of being “in” or “out” of the group, peer relationships influence students' motivation and achievement in school (A. Ryan, 2001). In one study, sixth-grade students without friends showed lower levels of academic achievement and fewer positive social behaviors and were more emotionally distressed, even two years later, than students with at least one friend (Wentzel, Barry, & Caldwell, 2004). The characteristics of friends and the quality of the friendships matter, too. Having stable, supportive relationships with friends who are socially competent and mature enhances social development, especially during difficult times such as parents' divorce or transition to new schools (Hartup & Stevens, 1999). Children who are rejected or bullied by their peers are less likely to participate in classroom learning activities, so their achievement suffers; they are more likely to drop out of school as adolescents and may even evidence more problems as adults. For example, rejected aggressive students are more likely to commit crimes as they grow older (Buhs, Ladd, & Herald, 2006; Coie & Dodge, 1998; Fredricks, Blumenfeld, & Paris, 2004).

Culture and Community

There are many definitions of **culture**. Most include the knowledge, skills, rules, traditions, beliefs, and values that guide behavior in a particular group of people, as well as the art and artifacts produced and passed down to the next generation (Betancourt & Lopez, 1993; Pai & Adler, 2001). The group creates a culture—a program for living—and communicates the program to members. Groups can be defined along regional, ethnic, religious, gender, social class, or other lines. Each of us—recent immigrant or longtime resident—is a member of many groups, so we all are influenced by many different cultures. Sometimes the influences are incompatible or even contradictory. For example, if you are a feminist but also a Roman Catholic, you may have trouble reconciling the two different cultures’ beliefs about the ordination of women as priests. Your personal belief will be based, in part, on how strongly you identify with each group (Banks, 2002).

There are many different cultures, of course, within every modern country. In the United States, students growing up in a small rural town in the Great Plains are part of a cultural group that is very different from that of students from a large urban center or a Florida gated community. In Canada, students living in the suburbs of Toronto certainly differ in a number of ways from students growing up in a Vancouver high-rise apartment or on a farm in Quebec. Within those small towns in the Great Plains or Quebec, the child of a convenience store clerk grows up in a different culture from the child of the town doctor or dentist. Individuals of African, Asian, Hispanic, Native American, or European descent have distinctive histories and traditions.

The experiences of males and females are different in most ethnic and economic groups. Everyone living within a particular country shares many common experiences and values, especially because of the influence of the mass media. But other aspects of their lives are shaped by differing

RELATING TO EVERY CHILD

Different Parenting Styles in Different Cultures

NOT EVERY STUDY finds results consistent with Diane Baumrind’s findings about the problems that accompany authoritarian styles in White, middle-class families. Other research indicates that higher control, more authoritarian parenting is linked to better grades for Asian and African American students (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). Parenting that is strict and directive, with clear rules and consequences, combined with high levels of warmth and emotional support, is associated with higher academic achievement and greater emotional maturity for inner-city children (P. W. Garner & Spears, 2000; Jarrett, 1995). Differences in cultural values and in the danger level of some urban neighborhoods may make tighter parental control appropriate, and even necessary (Smetana, 2000). In addition, in cultures that have a greater respect for elders and a more group-centered rather than individualistic philosophy, it may be a misreading of the parents’ actions to perceive their demand for obedience as “authoritarian” (Lamb & Lewis, 2005; Nucci, 2001). In fact, research by Ruth Chao (2001; Chao & Tseng, 2002) has challenged Baumrind’s conclusions for Asian families. Chao finds that an

alternative parenting style of *chiao shun* (a Chinese term that Chao translates to mean “training”) better characterizes parenting in Asian and Asian American families. Chao is also studying whether serving as a translator or “language broker” for parents who do not speak English has an impact on the child’s psychological well-being and relationship with the parents.

Research with Latino parents also questions whether parenting styles studies based on European American families are helpful in understanding Latino families. Using a carefully designed observation system, Melanie Domenech Rodríguez and her colleagues included a third dimension of parenting—giving children more or less autonomy (freedom to make decisions). They found that almost all of the Latino parents they studied could be characterized as *protective* (high on warmth, high on control/demand, and low on granting autonomy) or *authoritative* (high on all three—warmth, control/demand, and granting autonomy). Also, these Latino parents tended to be more demanding and less likely to grant autonomy to their female children (Domenech Rodríguez, Donovan, & Crowley, 2009).

cultural backgrounds. For example, even symptoms of psychological disorders are affected by culture. In industrialized cultures where cleanliness is emphasized, people with obsessive-compulsive disorders often become obsessed with cleaning their hands, whereas in Bali, where social networks are emphasized, people with obsessive-compulsive disorders often become obsessed with knowing all the details about the lives of their friends and family—their social network (Lemelson, 2003). In fact, some cultures have mental health disorders not experienced in the Western countries. For example, in some Southeast Asian cultures men might experience *amok*—an episode of murderous rage followed by amnesia or *koro*—a terrible fear that their genitals are receding into their bodies (Watters, 2010).

The preceding examples are not meant to imply that there are no universals in child development. Jerome Kagan and Norbert Herschkowitz (2005) remind us that “over 90% of 1-year-olds in every village, town, and city across the world will smile at the approach of the caretaker, remember and reach toward a place where an adult hid a toy, cry occasionally to an approaching stranger, and imitate some parental behaviors” (p. 32). Throughout this book we will consider both universals and the influences of culture.

Ethnicity and race are two important elements of culture that influence individual development.

Ethnicity and Race

Since the beginning of the 20th century, scores of immigrants have entered the United Kingdom, Western Europe, Canada, Australia, the United States, and many other postindustrial countries. These immigrants bring with them their cultures and languages. By the year 2020, more than 66% of all school-age children in the United States will be African American, Asian, Hispanic, or Native American—many the children of new immigrants. According to projections by the U.S. Census Bureau (2010a), the Hispanic and Asian populations will triple over the next half century and non-Hispanic Whites will represent only about one-half of the total population by 2050.

Ethnicity usually refers to groups that share common cultural characteristics such as history, homeland, language, traditions, or religion. The word *ethnic* is from the Greek word for “nation” or “foreign people”—*ethnos*. We all have some ethnic heritage, whether our background is Italian, Ukrainian, Hmong, Chinese, Japanese, Navajo, Hawaiian, Puerto Rican, Cuban, Hungarian, German, African, or Irish—to name only a few.

Race, on the other hand, has been considered “a social category that is defined on the basis of physical characteristics” such as skin color or hair texture (Yetman, 1999, p. 3). In effect, race is a label people apply to themselves and to others based on appearances, ancestry, or history. There are no biologically pure races. In fact, for any two humans chosen at random, an average of only .01% (about one-hundredth of 1 percent) of the alphabetic sequence of their genetic codes is different due to race (Smedley & Smedley, 2005). Still, race is a powerful construct. At the individual level, race is part of our identity—how we understand ourselves and interact with others. At the group level, race is involved with economic and political structures (Omi & Winant, 1994).

Today many psychologists emphasize that ethnicity and race are socially constructed ideas. In an interview for the *Monitor on Psychology*, Helen Rose Markus, who studies identity, said that both race and ethnicity share a similar definition as “a dynamic set of historically derived and institutionalized ideas and practices that allow people to identify or be identified on the basis of commonalities including language, history, nation, customs, physical appearance and ancestry” (DeAngelis, 2008, p. 30).

Sociologists sometimes use the term **minority group** to refer to a group of people that have less power than the dominant group and receive unequal or discriminatory treatment. There was a time when the term indicated a numerical minority as well. But today, referring to particular racial or ethnic groups as “minorities” in the *numbers* sense is technically incorrect in many situations, because in certain places the “minority” group is actually the majority—for example, African Americans in Chicago or Mississippi. So minorities may not always be fewer in numbers, but they often have less political or economic power and experience discrimination.

There is another important contextual influence on children as they develop—social class.

Social Class and Socioeconomic Status

In modern societies, levels of wealth, power, and prestige are not always consistent. Some people—for instance, university professors—are members of professions that have a reasonably high social status, but provide little wealth or power (believe us). Other people have political power even though they are not wealthy or they may be members of the upper-class social register in a town, even though their family money is long gone. Most people are generally aware of their social class: they perceive that some groups are above them in social class and some are below. They may even show a kind of “classism” (like racism or sexism); they believe they are “better” than members of lower social classes and avoid associating with them.

There is another way of thinking about class differences that is commonly used in research. Sociologists and psychologists combine variations in wealth, power, control over resources, and prestige into an index called **socioeconomic status (SES)**. In contrast to social class, most people are not conscious of their SES designation. SES is more ascribed to people by researchers; different formulas for determining SES might lead to different assignments (Liu et al., 2004). No single variable, not even income, is an effective measure of SES. Most researchers identify four general levels of SES: upper, middle, working, and lower SES. The main characteristics of these four levels are summarized in Table 1.2.

Research in child development often examines variables such as race, SES, religion, ethnicity, or gender separately, because such research is easier to conduct and interpret. Of course, real children are not just African American or Buddhist or female; they are complex beings and members of many groups. Even though cultural and socioeconomic contexts are powerful influences on development, these influences are not consistent in their effects on every person, as James Banks cautions:

Although membership in a gender, racial, ethnic, social-class, or religious group can provide us with important clues about an individual’s behavior, it cannot enable us to predict behavior. *Membership in a particular group does not determine behavior but makes certain types of behavior more probable.* (1993, pp. 13–14, emphasis in original)

TABLE 1.2 • Selected Characteristics of Different Social Classes

	UPPER CLASS	MIDDLE CLASS	WORKING CLASS	LOWER CLASS
Income	\$200,000+	\$110,000– \$200,000 (1/2) \$50,000– \$110,000 (1/2)	\$25,000– \$50,000	Below \$25,000
Occupation	Corporate, professional, family money	White-collar, skilled blue-collar	Blue-collar	Minimum wage, unskilled labor
Education	Prestigious colleges and graduate schools	High school, college, or professional school	High school	High school or less
Home ownership	At least one home	Usually own home	About half own a home	Uncommon
Health coverage	Full	Usually	Limited	Uncommon
Neighborhoods	Exclusive or comfortable	Comfortable	Modest	Deteriorating
Afford children’s college	Easily	Usually	Seldom	Uncommon
Political power	National, state, local	State or local	Limited	No

Source: Based on Macionis, J. J. (2010). *Sociology* (13th ed). Upper Saddle River, NJ: Pearson, and Macionis, personal communication (April 2, 2010).

Another set of contextual influences comes from the larger society in which the individual develops and the policies of that society.

Society and Policy

In 2010, the *New York Times* published an article reporting the effects of Title XI, the regulation in the United States that required schools and colleges receiving federal money to provide the same opportunities in sports for girls as they do for boys (Parker-Pope, 2010). When the amendment passed in 1972, schools and colleges protested that they could not afford the increases in sports budgets, but the results of these two studies (Kaestner & Xu, 2010; B. Stevenson, 2010) show the money was well invested. For example, even after taking other important influences into account, Title XI explained about 20% of the increase in women's educational level and 40% of the rise in employment for 25- to 34-year-old women and a 7% decrease in obesity rates for the same age group. This federal policy has had dramatic effects for many women who attended high school after the early 1970s—maybe you are one of them.

Different societies and countries have different social and educational policies affecting development. What kind of prenatal care and education are available for expectant mothers? Are there national policies supporting maternity leave for new parents? What sort of childcare is provided for preschool age children? When do children begin school? Is there financial support available for higher education or job training? For example, as you will see in Chapter 6, there are great variations among countries in the childcare available to 4- and 5-year-olds. All 4-year-olds in Ireland and in the Netherlands are in school. All children in Belgium and France have access to preschool if their families want to send them. Most children in postindustrial societies attend at least a half-day kindergarten when they are 4 or 5. As you can see in Table 1.3, countries vary greatly in the amount of leave new parents are allowed when a baby is born. All these societal and policy differences can affect physical, cognitive, and emotional/social development. We will examine these contextual influences in the upcoming chapters.

TABLE 1.3 • A Few Examples of Policies Governing Leaves for Parents of New Babies in Different Countries

COUNTRY	DURATION OF LEAVE	PERCENT OF WAGES REPLACED
Australia	1 year parental leave	Unpaid
Mexico	12 weeks maternity (6 weeks pre-birth)	100%
Switzerland	16 weeks maternity (8 weeks mandatory)	100%
Turkey	16 weeks maternity	66.7%
Canada	50 weeks (15 weeks maternity + 35 weeks parental leave shared with father)	55% up to \$447/week
Italy	22 weeks (2 before birth)	80%
Greece	119 days	100%
Japan	14 weeks (6 pre- and 8 post-birth)	60%
Denmark	52 weeks: 18 to be taken by the mother, 2 weeks by the father, the rest as they see fit	100%
United States	12 weeks family leave, includes maternity	Unpaid

Source: Based on data from catalyst.org/publication/240/family-leave-us-canada-and-global; en.wikipedia.org/wiki/Parental_leave.

Time and Place: Historical Contexts and Cohorts

Anita (one of your textbook authors) is a Baby Boomer—someone born between 1946 and 1964. She arrived after her father returned from World War II and started college under the GI bill, so her life was affected by a government policy that allowed her father to earn a degree. Nancy (your other textbook author) is also a Boomer, but born toward the end of that period and in Canada, so she experienced different events and different government policies growing up. Anita's children are all members of Generation X (1965–1981), so they have no memories of the civil rights movement in the United States or the Vietnam War—experiences that defined Anita's high school and college years. Most undergraduates today are Millennials, sometimes called Generation Y, born between roughly 1982 and 2002; you may be a member of that group yourself.

Millennial, Generation X, Baby Boomer—these names assigned by the media and popular culture refer to people born during certain time periods. According to popular wisdom, Baby Boomers are better educated and more individualistic than previous generations, more optimistic about money (they did not experience the Great Depression—until lately anyway), more comfortable with technology, and less respectful of authority. For Generation Xers, racial segregation has always been illegal and the ability to walk on the moon is a given. Millennials are said to be more conforming and conventional and closer to their parents than Gen Xers (Howe & Strauss, 2000). Some people now identify a Generation Z, born in the 2000s. Others label these children the iGeneration (Rosen, 2010). So far the main characteristics highlighted for this group involve familiarity with and dependence on technology—IM, YouTube, cell phones, texting, the Internet, Twitter, Facebook. . . . Members of this generation sometimes are called “digital natives.” These are not scientifically established groupings, but the designations let us consider the more scientific idea of cohorts.

A **cohort** is a group of people who share the same historical context because they were born during the same time period, during the presidential administration of Ronald Reagan, for example, or in the years right after the 9/11 destruction of the World Trade Center. A cohort can be narrowly defined, for instance—everyone born in 2000, or more broadly, such as the millions of Baby Boomers born during the post-World War II years. People in a cohort share many historical, economic, and social experiences, especially now that the media and Internet disseminate information so quickly and widely. For example, in the United States 200 years ago, close to 70% of children lived on farms with two parents and had little or no access to travel, and no access to radio, television, or the Internet. Today about 70% live with one parent or two working parents, not on farms, but with access to radio, television, travel, and the Internet (Kagan & Herschkowitz, 2005).

As we write this chapter, people around the world are dealing with HIV and AIDS, a challenge not faced by children and adults before the 1980s. They also are worried about the increasingly destructive hurricanes; pandemics such as the avian flu; melting ice caps, unending droughts, riots, and wars; and financial crises around the entire world. Children growing up in many countries today must deal with violence and terrorism on a scale much greater than that faced by their parents or grandparents. So *when* you grow up—in what cohort—has a major impact on your development. It even has an impact on your name, as you can see if you go to ssa.gov/OACT/babynames/ and type in your birth year or any year back to 1880. For example, the most popular names in 1880 were John and Mary. By 1995 the top names were Michael and Jessica, and in 2012, the most popular names were Jacob, Mason, Sophia, and Isabella.

So, there is much to learn in the next years and much already known about the complexities of development. Why should you care?

✓ Check your understanding in the Pearson etext

WHY STUDY DEVELOPMENT?

You are beginning your investigation of child development, perhaps as a required course, perhaps as an elective. What can you hope to gain by studying this rapidly growing field? We turn to that question to end this first chapter.

Teaching

Many of you are planning to be teachers. What better foundation for quality teaching is there than an understanding of the people you will teach? In addition, teachers are a major force in children's development. Bridgett Hamre and Robert Pianta (2001) followed all the children in a small school district who entered kindergarten during one year and continued in that district through the eighth grade. The researchers found that the quality of the teacher–student relationship in kindergarten (defined in terms of level of conflict with the child, the child's dependency on the teacher, and the teacher's affection for the child) predicted a number of academic and behavioral outcomes through the eighth grade, particularly for students with high levels of behavior problems. Even when the gender, ethnicity, cognitive ability, and behavior ratings of the student were accounted for, the relationship with the teacher still predicted aspects of school success. Based on the results of this carefully conducted study, it appears that students with significant behavior problems in the early years are less likely to have problems later in school if their teachers are sensitive to their needs and provide frequent, consistent feedback.

So teaching is important in children's development. This leads to a question probably of interest to you: What is good teaching? Is it science or art, the application of research-based theories or the creative invention of specific practices? As we will say many times in this book, *beware of either/or choices*. Teachers must be both theoretically knowledgeable and inventive. They must be able to use a range of strategies, and they must also be able to invent new strategies. They must have some basic research-based routines for managing classes, but they must also be willing and able to break from the routine when the situation calls for change. They must know the research on children's development, “patterns common to particular ages, culture, social class, geography, and gender” (Ball, 1997, p. 773) and they also need to know their own particular students who are unique combinations of culture, gender, and geography. This book will help you understand development.

Other Careers

You may not be planning a career in teaching that requires knowledge of child development. But you may have worked as a camp counselor, nursery aide at your church, or volunteer in the pediatric wing of a hospital. Perhaps these experiences encouraged you to explore child development in college. Or maybe you don't even have a major yet and are open to many career possibilities. What are those possibilities?

Careers in child development might be in education, medicine, consultation and counseling, or research. Some careers require only a 2-year associate degree, others need a bachelor's or master's degree, and some require an advanced degree such as an M.D. or Ph.D. You may be familiar with some careers, such as kindergarten teacher or pediatrician. Other careers may be new to you. For example, today there are many people working in children's hospitals called Child Life Assistants or Child Life Specialists. These people have 2- or 4-year college degrees in child development or a related field. On their Web site, the Child Life Council describes the profession as:

. . . trained professionals with expertise in helping children and their families overcome life's most challenging events. Armed with a strong background in child development and family systems, child life specialists promote effective coping through play, preparation, education, and self-expression activities. They provide emotional support for families, and encourage optimum development of children facing a broad range of challenging experiences, particularly those related to healthcare and hospitalization. (childlife.org/TheChildLifeProfession/)

Table 1.4 describes the possibilities for several example careers in education, medicine, and mental health areas that require different levels of education. The Web site associated with each career provides more information.

TABLE 1.4 • Careers in Child Development

2-YEAR PROGRAMS/ASSOCIATE DEGREE		
EDUCATION	MEDICAL/NURSING	MENTAL HEALTH
<i>Park/Recreation Leader</i> bls.gov/oco/ocos058.htm	<i>Associate in Nursing</i> noadn.org/all.php	<i>Social & Human Services Assistant</i> bls.gov/oco/ocos059.htm
<i>Childcare Worker</i> bls.gov/oco/ocos170.htm	<i>Hospital Child Life Assistant</i> childlife.org/	<i>Substance Abuse Counselor</i> flahec.org/hlthcareers/SUBST.HTM
4-YEAR PROGRAMS/BACHELOR'S DEGREE		
EDUCATION	MEDICAL/NURSING	MENTAL HEALTH
<i>Elementary/Secondary Teacher</i> bls.gov/oco/ocos069.htm	<i>Pediatric Nurse</i> pedsnurses.org/becomingaPediatricNurse.html	<i>Child Welfare Worker</i> cwla.org/default.htm
<i>Children's Book Author or Illustrator</i> cbcbooks.org/	<i>School Nurse</i> nasn.org/	<i>Art Therapist</i> arttherapy.org/
MASTER'S DEGREE		
EDUCATION	MEDICAL/NURSING	MENTAL HEALTH
<i>School Principal</i> naesp.org/	<i>Speech Therapist</i> asha.org/	<i>School Psychologist</i> nasponline.org/
<i>Learning Disabilities Teacher</i> ldaamerica.org/	<i>Genetic Counselor</i> nsgc.org/careers/index.asp	<i>Social Worker</i> naswdc.org/
	<i>Pediatric Occupational Therapist</i> pediatricoccupationaltherapist.net/	
DOCTORATE		
EDUCATION	MEDICAL/NURSING	MENTAL HEALTH
<i>College Professor</i> aera.net/	<i>Pediatrician</i> aap.org/	<i>Parenting Coordinator in Divorces</i> apa.org/monitor/jan05/niche.html
<i>Child Development Researcher</i> srcd.org/	<i>Child Psychiatrist</i> aacap.org/	<i>Family Therapist</i> aamft.org/

Parenting

Not all of you reading this book will select a career in child development, but many of you someday will have, or already do have, children. Take a moment now to type “parenting” into a search engine. Look at the hundreds of millions of resources and Web sites available. How will you evaluate this wealth of information? Surely knowledge of child development is useful for parents, but how do you select good information? Do parenting skills really matter? How much and for what outcomes?

If you become a parent, how will you know if your child's problems are fairly typical or deserve further attention? Early but appropriate intervention is important. Who could provide interventions if they are needed? How will you evaluate the claims of toy manufacturers, food companies, childcare facilities, or “how-to-parent” books and Web sites? The information in the next 12 chapters will help with all these challenges.

Relations between parents and their children change across time (Lamb & Lewis, 2005). In the early years, parents help their children learn that their behaviors have consequences. With parents' support, children also develop a sense of competence in their own growing abilities and appropriate trust in others. As children mature, parents help them develop self-control and self-regulation. In adolescence, parents are stable “targets” for their children's testing of limits and strivings for autonomy. But, of course, parents are not the only influence as children develop (J. R. Harris, 1998). “Certainly, researchers see parent-child relationships as dynamic systems that vary in quality depending on individual, familial, societal, and cultural circumstances” (Lamb & Lewis, 2005, p. 455). This book will help you make sense of all this information so you can be a better parent.

Policy and Child Well-Being

Some of you will work in child development careers, more of you will be parents, but all of you will be citizens and voters who can influence the public policies that affect children and families. The goal of these public policies should be child well-being.

WHAT IS CHILD WELL-BEING, AND HOW IS IT MEASURED? There are many definitions of well-being and many disciplines have specific measures that define well-being. For example, an economic definition of well-being may have to do with the per capita income of a neighborhood whereas a public health definition may focus on the number of teenagers who give birth or the number of underage babies delivered. Several organizations (e.g., the Annie E. Casey Foundation and the Children’s Defense Fund) have begun to establish broader definitions using amalgamations of measures across disciplines. Their definitions tend to include multiple measures in at least four domains considered the most powerful in helping children develop to the fullest: community and family, health, economic stability, and education.

The effort to measure child well-being extends back to the 1930s but gained more international support when the United Nations passed a series of instruments called the *Declaration of Human Rights* in 1948, designed to “protect human rights through principles of equality and non-discrimination” (Office of the High Commissioner of Human Rights, 1989). The Convention of the Rights of the Child (CRC) followed much later in 1989 and officially “spells out basic human rights that all children have with respect to survival and development to the fullest” (Britto & Ulker, 2012). In short, the CRC mandates that national systems must support caregivers in creating optimal contexts for healthy and prosperous children. Moreover, it names the “duty-bearers,” ranging from those who are proximal in relation to the child (e.g., parents) to distal (teachers, medical personnel, policy makers, etc.) and holds them accountable for a minor’s health and wellness.

WHY IS CHILD WELL-BEING AN IMPORTANT POLICY FOCUS? As research in this field emerges, it is increasingly clear—factors that support or undermine well-being influence every aspect of a child’s survival and development. Globally, infant mortality rates still hover around 10% and most of these deaths could be avoided through the distribution of nutrition and disease prevention measures. Violence and abuse are universally confirmed by research literature to have a negative impact on children’s development, especially because so many children “who suffer violence in their homes lack the capacity to report” (Britto & Ulker, 2012). It seems, however, that neglect can have as detrimental an impact as abuse: one study of infant *attachment* (described in Chapter 4) shows that the children of detached or conflicted parents are more likely to be anxious and suffer psychological problems. But children who experience early secure attachment to a parent are more socially competent and comfortable throughout their entire lives (Benoit, 2004; Tough, 2012). Conversely, children who grow up with a single parent are more likely to suffer from multiple disadvantages (criminality, dropout, joblessness) as compared with other children (Layard, 2005). Noncognitive factors such as curiosity, self-control, and social fluidity make children “less likely ever to have been arrested, and less likely to have spent time on welfare” (Tough, 2012).

Clearly, numerous factors are at work in the development of a healthy, well-adjusted, and flourishing child. What sort of work leave policies support families without harming businesses? Is full-day kindergarten better than half-day? For whom? Are government expenditures for early childhood education or children’s television valuable? How much and what kind of achievement testing is useful in helping children learn? Are smaller classes worth the larger costs? How do we provide prenatal education and care for young women who cannot afford it? What will happen if we don’t provide it? What are the implications of policy decisions for child development and how can you know? These are questions every citizen should be able to answer for the good of future generations (Groark & McCall, 2005). See the *Policy and Child Well-Being* for guidelines about evaluating possible policies. This is the first of many features in our text that will help you understand and evaluate policies affecting children in the United States and around the world. We hope this text will help you as a voter and as a global citizen.

Policy and Child Well-Being: Supporting Children's Development

Policies that support child well-being hinge on the child's rights to survival, development, and protection. Additionally, good policy acknowledges that well-being spans physical, emotional, and sociocognitive growth. Here are some questions that may guide your own voting and advocacy decisions:

Guidelines for Evaluating Policies That Support Children's Development

- Does this policy reduce violence or harsh disciplinary practices?
- Does this policy promote child safety and security while sustaining freedom to engage and participate?
- Does this policy promote child safety from accidents, disasters, or disease?
- Does this policy make preventative and healthy measures (proper housing, hygiene, or early education) more accessible to children?
- Does this policy support proximal caregivers and help them access or execute proper care of their children?

Policy and Child Well-Being by Lauren Bailes.

SUMMARY

• What Is Child Development?

Developmental scientists study human growth and change from conception until death, often called *lifespan development*. Child development focuses on the time period from conception through adolescence, roughly the time from 0 to about 20 years old—the span covered by this book. The science of human development involves asking carefully specified questions based on current understandings (theories), systematically gathering and analyzing of all kinds of information (data) about the questions, modifying and improving explanatory theories based on the results of those analyses, and then asking new questions based on the improved theories.

• Organizing Child Development: Periods and Areas

This book is organized by periods of development—*beginnings* (which includes prenatal development, infants, and toddlers), *early childhood*, *middle childhood*, and *adolescence*. These time periods are commonly used to organize discussions of child development because they tend to be characterized by particular patterns of limitations, capabilities, expectations about the child, and environments for development. Children progress from being infants who need care to survive to becoming toddlers who can crawl, then walk; babble, then talk; and interact with family to form social bonds. The new environment for the infant is the world outside the womb, but mostly the family. The period of early childhood brings new environments outside the home such as preschool or kindergarten; developing children are expected to assume more and more responsibility for their own care—feeding themselves,

toilet-learning, getting along with other children, and so on. During middle childhood, ages 6 or 7 to 11, most children in postindustrial cultures are in the world of school. Their developing brains, language, and self-control allow them to learn reading, writing, arithmetic, science, history, and many other subjects. They can play organized games and sports, form and abandon friendships, and understand more abstract concepts such as intention and morality. The transition to adolescence is marked by the physical and psychosocial changes of puberty. Everything changes. In addition to physical changes, there are growing cognitive capabilities to think abstractly, leading to greater idealism and the ability to handle more advanced abstract learning. The new environment is the world of peers, high school, work, and even college for some, because adolescence continues until ages 18 to 22 years or so.

Child development can be divided into physical development (changes in the body and brain), cognitive development (changes in problem solving, memory, language, reasoning, and other aspects of thinking), and emotional/social development (changes in the individual's feelings, personality, self-concept, and relations with other people). We discuss physical, cognitive, and emotional/social development in separate chapters for each time period, but these domains are not separate in children.

• Basic Themes and Debates in Development

Three current debates in child development are: (a) Is human development a continuous process of adding to and increasing abilities, or are there leaps or moves to new stages when abilities actually change? Are changes

continuous and quantitative (more of the same) or discontinuous, leading to qualitative differences? This may not be an either/or question because some changes that look discontinuous may be the result of very gradual changes over time and some changes that look continuous may result from using qualitatively different strategies. (b) Are there critical periods when certain abilities, such as language, need to develop? There are critical times in prenatal development when exposure to a toxin or a disease afflicting the mother, such as rubella, will cause damage to the developing fetus. There appears to be a critical period for learning accurate language pronunciation. Some critical periods for development appear to depend on the plasticity (adaptability or modifiability) of brain organization and structures. Most developmental psychologists today talk about sensitive periods—not critical periods. These are times when a person is especially ready for or responsive to certain experiences. (c) Which is more important in development, the “nature” of an individual (heredity, genes, biological processes, maturation, etc.) or the “nurture” of environmental contexts (education, parenting, culture, social policies, etc.)? This debate proved too complicated to be settled by splitting alternatives into either/or possibilities. Current views emphasize complex coactions (joint actions) of nature and nurture. Developmental systems theories are general perspectives on development, heredity, and evolution that emphasize the study of *interactions and coactions* between the many influences on development, without falling into the kinds of “which is better” debates.

- **What Are the Contexts for Development?**

Developmental scientists are increasingly interested in the role of context: the total setting or situation that surrounds and interacts with a person or event. Contexts also influence the development of behaviors, beliefs, and knowledge by providing resources, supports, incentives and punishments, expectations, teachers, models, tools—all the building blocks of development. Children grow up in families and neighborhoods. They attend schools and are in classes, teams, or choirs. They are members of particular ethnic, religious, economic, and language communities. The social and educational programs and policies of their governments affect their lives. Moreover, the contexts in which we live and develop are incredibly diverse. Family structures and parenting styles differ. Cultural rules and expectations differ. Resources, histories, and challenges for different ethnic, racial, geographic, religious, language, and SES groups differ. Finally, children develop in different historical times and under different societal policies and practices.

- **Why Study Development?**

We can’t summarize this for you, but we can say that you will use knowledge of child development throughout your life—perhaps as a parent, aunt, uncle, teacher, medical worker, recreational leader, mental health worker, art therapist, speech therapist, social worker, school psychologist, or therapist. No matter what, you will be better able to evaluate whether educational, health, social, and governmental policies support children’s well-being. Enjoy the exploration.

PRACTICE USING WHAT YOU HAVE LEARNED

To access and complete the exercises, click the play buttons on the images below.

Observing Child Development



The Shape and Timing of Development



KEY TERMS

blended families 15
 child development 4
 coactions 12
 cognitive development 7
 cohort 20
 context 13
 continuous development 9
 critical periods 10
 culture 16
 development 4

developmental science 4
 developmental systems theories 12
 discontinuous development 9
 emotional/social development 7
 ethnicity 17
 extended families 15
 maturation 7
 minority group 17
 nuclear family 15
 parenting styles 15

physical development 7
 plasticity 11
 postindustrial 6
 prenatal 6
 race 17
 sensitive periods 11
 social construction 6
 socioeconomic status (SES) 18
 tabula rasa 8
 theory 5

THE CASEBOOK

APPLYING YOUR KNOWLEDGE OF CHILD DEVELOPMENT

Every chapter in this text will begin with a case involving child development. The issues raised and problems posed will relate to the information in the chapter that follows. But in this chapter, the focus of the case is very specific: you. Why are you taking this class, and what will you do with the knowledge you gain? Do you plan a career in child development? Which one? How will you decide? Should you consider being a teacher, social worker, physician, child life specialist, speech therapist, psychologist, researcher, nutritionist, pediatric or neonatal nurse, recreational or camp director, children's minister, college professor, public policy analyst, or . . .? Are you now or will you ever be a parent, aunt, uncle, foster parent, guardian, voter, or . . .? If your answer to any of these questions is "yes" or even "maybe," then you need to think critically about what this class means for your future.

WHAT WOULD THEY DO?

Here is how some students like you responded:

SARAH GRAFF—World Languages and Cultures/ Spanish Major

California State University—Monterey Bay, Seaside, CA

For as long as I can remember, I have enjoyed interacting with children. As a child, I attended an elementary school that strongly encouraged and facilitated cooperative learning and a sense of community. The classroom where I spent most of my elementary years was made up of students in kindergarten all the way to sixth grade. It was this early exposure to children of all ages and interacting and learning with them that initially directed me toward the path of babysitting throughout middle school, high school, and college, and now toward pursuing a career in child development.

Today I am a junior in college and after taking my first class in child development, I am adding a minor in Human Development. I hope to eventually receive my masters, in Education and pursue a career as a Special Education or Spanish teacher.

Children have a curiosity and wonder to them that are difficult to find among adults. Working with children is rewarding not only for that reason; I want to continue to promote that curiosity and love of learning in the classroom. I hope to put my creativity and joy of working with children to use as a teacher. Understanding child development is critical to being a productive and positive teacher but is also knowledge I hope to use as a future aunt and mother.

EMILY WALER—Communication Sciences and Disorders Major

Ohio University, Athens, OH

I have always loved interacting with children – I have held numerous babysitting and nannying jobs, and I especially enjoy spending time with my younger siblings and their friends. When I started my undergrad studies, I knew that I wanted to work in a field where I could interact with children on a daily basis, and not only care for them but help them accomplish goals by providing a needed service. Speech-language pathology was a good fit for me and now I am on my way to a career that is challenging, innovative and, most importantly, rewarding. Being able to provide therapy to children with autism, speech impediments, cleft lip/palates, traumatic brain injuries, and numerous other things that can affect a child's ability to communicate requires patience, knowledge, an active imagination, and optimism. Every child acquires language at a different pace, and being committed to helping a child through these stages of language development is an important aspect of this field. As I have observed

professionals providing therapy to clients in the clinic at my university, I have seen how language develops in different individuals and how important it is that children be able to express themselves. I am anxious to begin my master's studies to become a licensed speech-language pathologist.

MADLINE MURPHY—Master's of Science in Child Development, Specialization in Child Life

Erikson Institute, Chicago, IL

While studying child development in college, I began my formal work with children in a Head Start preschool and in a home for medically fragile children. I was able to apply my knowledge of typical and atypical child development in direct contact with children and their family members. My passion for child development then took me into the classroom for 2 years. While teaching eighth grade in a poverty-stricken community, I viewed each student's academic level and overall development in terms of genetics, environmental factors, and behavior. Child development knowledge has also been helpful in less formal settings such as coaching and volunteering in pediatric facilities.

I am currently using the child development knowledge that I have gained throughout my graduate schooling in a child life internship. I plan to continue into the Child Life profession where child development will be my main focus. The role of Child Life is to alleviate stress and anxiety associated with medical procedures and hospitalizations while aiding each child in continuing their social, cognitive, physical, and emotional development. As a child life specialist, I will teach coping mechanisms, provide distractions, and construct therapeutic play opportunities to reduce feelings of isolation, despair, anger, and physical pain. My background in child development will help me to design medical education and activities for children and empower caregivers with knowledge and support to improve their health care experiences.

ALYSSA VOGT—Special Education Major

University of Wisconsin–Madison, Madison, WI

I have had many different meaningful experiences working with children, all of which have had an impact on preparing me to work with children in my future career. As a babysitter, I learned the necessary skills of how to care for the needs of children. I have tutored many different students at all grade levels in various subjects. As a tutor, I was a mentor to my students and developed a meaningful relationship with them.

One of the greatest experiences, though, was working as a counselor at a summer camp for individuals with disabilities. At this camp, I first discovered that becoming a special

education teacher was my true calling in life. Now, I am majoring in Special Education with a concentration in working with individuals with cognitive disabilities. My child development courses as well as my years of working with children will help me to be successful in my future profession.

JADE EVETTE MUÑOZ

Texas A&M University–Corpus Christi, Corpus Christi, TX

I have had multiple rewarding experiences with children. My first experience was coaching and refereeing youth indoor soccer and basketball games, which I have done since the age of 14. I have also spent the past four summers as a camp assistant site coordinator working with more than 150 children a day from the ages of 7 to 14. During my time in Corpus Christi, I worked as a tutor and after-school counselor at a local arts and education center, and I am currently working at the early childhood development center at Texas A&M Corpus Christi, assisting in elementary school classes. I have a great passion for working with children. I know the kids feed off my passion and desire to see them succeed. After finishing my bachelor's degree, my goal is to earn my master's. I would like to further my education by learning more ideas and concepts that I will be able to use in the classroom.

**SUSAN KILEY—Master's Graduate Student—
School of Social Work**

Boston University, Boston, MA

My education and experience working with children began when I interned at a group home for homeless teenage mothers, which led to a job working with adolescents and their families with substance abuse disorders at a children's hospital. Currently, I work as a middle school counselor and am working toward my master's in social work to become a licensed clinical social worker. Working with children, specifically pre-teen adolescents, has been especially rewarding. As we become adults, we tend to forget about that unique time in our lives when we were discovering the world around us, and determining how we fit into it as an individual. Preadolescence brings qualities of wonderment, curiosity, internal and external conflict, and innocence that we, as adults, can lose through our life experiences as we grow older. One of the most special contributions I've gained in my work with children is the understanding of how we can learn from the inner child in all of us—a time when we viewed the world with a fresh lens. Although working with children brings many challenges, its intimate personal advantages combined with the opportunity to help a child make it a career unlike any other!

2 | THEORY AND RESEARCH IN CHILD DEVELOPMENT

THE CASEBOOK

WHAT WOULD YOU DO? GIVING PERMISSION FOR CHILDREN TO PARTICIPATE IN RESEARCH

Today there are many procedures to protect children and adolescents when they participate in research. One of the most important is informed consent from parents or guardians. Here is a sample consent form Anita has used in research on middle school children's motivation to learn mathematics.

This is a parental permission form for research participation.

It contains important information about this study and what to expect if you permit your child to participate.

Your child's participation is voluntary.

Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose: The purpose of this study is to examine the influence of perceived classroom psychological environment, personal beliefs, and feelings on middle school students' academic achievement and effort outcomes in mathematics.

Procedures/Tasks: Your child will be asked to respond to a self-report questionnaire in his/her classroom. Also, your child's achievement test scores and grades in mathematics will be obtained from school records.

Duration: Survey administration will take approximately

15 to 25 minutes. Participation in the survey is completely voluntary, and your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University. However, participation would be highly appreciated.

Risks and Benefits: There is no risk for your child to participate in this study. The results of this study will contribute to our understanding of the classroom psychological factors affecting early adolescents' motivational, emotional, and academic outcomes. Knowing students' individual perceptions will help us generate more effective middle school environments responsive to early adolescents' developmental needs. Efforts in this study are dedicated to contributing to the development of lifelong successful individuals. The findings of this study might be used in teacher preparation and school enhancement programs so that middle school students can study in classrooms where they can experience joy and success.

Confidentiality: Identifiable student data will not be shared with anyone, including schoolteachers, administrators, parents, and colleagues. To prevent any incidence of revealing students' data, students will be assigned participant numbers, and a list of students' names and participant numbers will be kept separate from the data. All data will be de-identified by including participant



numbers only. Efforts will be made to keep your child's study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child's participation in this study may be disclosed if required by state law. Also, your child's records may be reviewed by the following groups _____.

Incentives: Each participating student will have a chance to win one of the forty \$10 gift cards determined through a drawing following the completion of the study in _____.

Participant Rights: You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status. If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study. An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project

and found it to be acceptable, according to applicable state and federal regulations and university policies designed to protect the rights and welfare of participants in research.

Contacts and Questions: For questions, concerns, or complaints about the study you may contact _____.

Signing the Parental Permission Form: I have read (or someone has read to me) this form, and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study. I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Parent or Guardian Signature _____ Date _____

CRITICAL THINKING

- If you were a parent reading this form, what would you think?
- Would you sign?
- How are children protected by this procedure?

OVERVIEW AND OBJECTIVES

Several different fields are interested in the how and why of children’s development, so we have many perspectives and theories to explore. In this chapter we preview the theories that will be important throughout our journey: ethology and sociobiology, Freud’s psychoanalytic theory, Erikson’s psychosocial theory, classical and operant conditioning, Bandura’s cognitive learning theory, information processing theories, Piaget’s cognitive developmental theory, Vygotsky’s sociocultural theory, Bronfenbrenner’s bioecological theory, and Thelen’s dynamic systems theory. Then we ask where these theories came from and examine the process of research in child development. Along the way we hope you will become a more critical reader and thinker about explanations of children’s growth and development. By the time you finish this chapter, you should be able to do the following:

- Objective 2.1 Make the case that child development is a diverse field—multidisciplinary, multicultural, applying multiple methods, and producing multiple theories.
- Objective 2.2 Summarize these developmental theories: ethology and sociobiology, Freud’s

psychoanalytic theory, Erikson’s psychosocial theory, classical and operant conditioning, Bandura’s cognitive learning theory, information processing theories, and Piaget’s cognitive developmental theory.

- Objective 2.3 Describe these contextual and dynamic theories: Vygotsky’s sociocultural theory, Bronfenbrenner’s bioecological theory, and Thelen’s dynamic systems theory.
- Objective 2.4 Explain the scientific research cycle in studying children’s development, including methods for gathering information about development and different research designs (correlational, experimental, quantitative, and qualitative).
- Objective 2.5 Discuss critical issues in child development research including key ethical considerations; comparing and contrasting basic, applied, and community-based research; assuring reliability, validity, and cultural sensitivity in research about children; and evaluating sources of information about child development.

DIVERSITY IN THE STUDY OF DEVELOPMENT

People have been interested in children—especially the children in their families—since time began. But the science of child development is only about 100 years old. Who studies child development today? The theorists and researchers are from many different disciplines and cultures. They apply a range of methods and have created a wealth of theories.

OUTLINE

The Casebook—Giving Permission for Children to Participate in Research: What Would You Do?

Overview and Objectives

Diversity in the Study of Development

Explanations of Development

Contextual and Dynamic Systems Theories

Where Do the Theories Come From?

Research Methods and Designs

Issues in Child Development Research

Summary and Key Terms

The Casebook—Giving Permission for Children to Participate in Research: What Would They Do?

Multidisciplinary

Many people are interested in the “what” and “why” questions of child development. What are the typical motor skills of a 5-year-old? Why do some children walk earlier or run faster than others? Why do some babies sleep through the night at 8 months, while others are still waking every few hours at 18 months? What can be done to help the 18-month-old (and her parents) sleep more easily? Are there gender differences in math ability or in aggression? What explains the changes in memory abilities as children develop? Psychologists dominated the study of child development in earlier times, but today, questions of child development increasingly require multidisciplinary research along with the efforts of psychologists, educators, anthropologists, neuroscientists, pediatricians, psychiatrists, public health workers, economists, linguists, sociologists, social workers, and others using the tools and knowledge from their fields (L. A. Jensen, 2012; Lerner, 2006b; Salkind, 2004). In fact, the Society for Research on Child Development (SRCD) established a Multidisciplinary Task Force in 2005. In a report this task force stated, “As the scientific world leans increasingly towards division and compartmentalization, SRCD’s role in encouraging a multidisciplinary perspective for understanding human development becomes increasingly important” (SRCD, 2006b, p. 1).

Multicultural

Understanding child development also requires a multicultural perspective. You saw in Chapter 1 that culture includes the knowledge, skills, traditions, beliefs, and values that guide behavior in a particular group of people as well as the art and artifacts produced and passed down to the next generation. Each of us is part of many different cultural groups, defined by our ethnicity, religion, race, geographic location, language, or other memberships. But diversity in cultures has not always been a major feature of research in child development. Carol Lee (2003) noted that the 1998 *Handbook of Child Psychology* (vol. 1) had only one chapter focused explicitly on African American or Latino populations. In other chapters, Lee claimed, European American middle-class norms and behaviors were used as the points of reference for all other groups. In addition, most of the primary authors of the chapters were European American.

Times are changing. In the sixth edition of the *Handbook of Child Psychology*, Lerner (2006b, p. 7) proclaims, “diversity of person and context has moved into the foreground of the analysis of human development.” Today, the SRCD has members from more than 50 countries—20% of its membership is from outside the United States. One goal in their strategic plan is “SRCD will incorporate cultural and contextual diversity in all aspects of the Society’s organization, activities, and memberships” (SRCD, 2005, p. 2).

Over the past decade, diversity has become a central concern in research and theory in child development. Psychologists today recognize that culture shapes development by determining what and how a child will learn about the world (L. A. Jensen, 2012; Thompson, 2012). For example, young Zinacanteco Indian girls of southern Mexico learn complicated ways of weaving cloth through informal teachings of adults in their communities. In Brazil, without going to school, children who sell candy on the streets learn sophisticated mathematics in order to buy from wholesalers, sell, barter, and make a profit. Cultures that prize cooperation and sharing teach these abilities early, whereas cultures that encourage competition nurture competitive skills in their children (Bakerman, Adamson, Koner, & Barr, 1990; Ceci & Roazzi, 1994). The stages observed by Piaget are not necessarily “natural” for all children, because to some extent they reflect the expectations and activities of Western cultures (Kozulin, 2003; Rogoff, 2003). Whereas European American parents may have goals for their children such as pride and self-esteem, Chinese parents may have goals such as perseverance and diligence (Li, 2011).

Multiple Methods

With multiple disciplines and cultures come multiple methods for studying the “what” and “why” questions of child development. As you saw in Chapter 1, early baby biographies were based on careful, detailed (but often biased) observations of infants in their first few years. Today, careful observation is still an important method, but that observation is more systematic and scientific. It would be almost impossible to describe all the methods that might be applied in the multidisciplinary study of child development, because so many fields are involved—from sociology to medicine to linguistics. Even the methods used within a single discipline such as psychology or education can be quite varied, as you will see later in this chapter when we take a closer look at research methods for studying child development.

Multiple Theories

There are many theories in the field of child development. Some are all-encompassing, grand theories, such as those by Piaget or Erikson, which explain many aspects of cognitive, social, and personality development. Others focus on much more specific areas such as how children remember life events or make moral judgments. Current emerging theories of development view the individual as embedded in multiple layers of interacting systems, from biological to societal and historical contexts (Bronfenbrenner & Morris, 2006; Thelen & Smith, 1998).

In the following section, we examine the major theories of development that will provide a frame to examine physical, cognitive, and emotional/social development in Chapters 3 through 13 of this text. After briefly noting early ideas about children, we examine five general perspectives or families of developmental theories: biological theories (ethology and sociobiology), psychoanalytic

theories (Freud and Erikson), learning theories (classical and operant conditioning, social cognitive theory, and information processing), cognitive stages and structures (Piaget), and contextual/dynamic theories (Vygotsky, Bronfenbrenner, and Thelen).

✓ Check your understanding in the Pearson etext

EXPLANATIONS OF DEVELOPMENT

Early writings about children came from sacred books and the works of philosophers. For example, Plato, an ancient Greek philosopher, suggested that children should be taken from their families and brought up by “experts,” because child rearing was too important for the future of society to be left to often-incompetent parents. The ancient Chinese philosopher Confucius is said to have cautioned, “The father who does not teach his son his duties is equally guilty with the son who neglects them.” Passages from the Christian Bible make recommendations to parents about child rearing: “Train a child in the way he should go, and when he is old he will not turn from it” (Proverbs 22:6). In Judaism, childhood is considered a period of purity, joy, and beauty to be valued and cherished. The Talmud states “childhood is a garland of roses” (Babylonian Talmud, Shabbat 152,119a). In the Hindu religion, there are a number of ceremonies and rituals around pregnancy, birth, and childhood including Jatakarma to welcome the newborn into the world, Namkarma (the naming ceremony), and the Upanayana ceremony when the child reaches school age. A passage from the Koran states, “Money and children are the joys of this life, but the righteous works provide an eternal recompense from your Lord, and a far better hope” (Qur’an 18:46). Clearly, many religions see children as valuable, but in need of training and guidance.

In the 1800s, the field of psychology was just emerging, and children’s development was the focus of many early pioneers: in Great Britain, Charles Darwin’s detailed observations of his own children; in the United States, G. Stanley Hall’s child study movement and John Dewey’s emphasis on child-centered education; in France, Alfred Binet’s research on children’s mental abilities; and in Italy, Maria Montessori’s schools.

The study of child development in the United States can be traced to societal and scientific concerns in the 1920s. John Dewey was studying and writing about the “whole child” in psychology and education. In addition, many young men being evaluated for military service in World War I were found either physically or cognitively unfit for service, so new organizations were funded with both public and private money to stimulate research on children’s development. In 1924, the National Research Council founded the Committee on Child Development (CCD), and the 1920s was named “The Decade of the Child.” Then, in 1933, CCD became the SRCDD, the most influential organization of child development researchers today (Cameron & Hagen, 2005).

Let’s examine the major perspectives on child development that have emerged in the last 100 years.

Biological Perspectives: Ethology and Sociobiology

All theories of child development recognize that children are biological as well as psychological beings. But ethology focuses on biological processes in development. **Ethology** is the study of how behaviors adapt to support the survival of all animals, including humans. By carefully observing animals in their natural settings, ethologists try to understand and explain particular behavior patterns and instincts that allow the animals to adapt (P. H. Miller, 2011).

Charles Darwin’s theory of evolution is a foundation of ethology, but the person most associated with ethology is Konrad Lorenz, a zoologist from Austria. You probably have seen pictures showing Lorenz swimming or walking with a gaggle of young geese. Lorenz’s (1973/1977) best-known work was on **imprinting**, the tendency of some animals to attach to the first nurturing figure they observe after they are born. Lorenz demonstrated this process by guarding a group of geese as they hatched. After this imprinting experience, the goslings followed him everywhere. The explanation was that staying close to the mother has survival value for young animals, so imprinting and bonding are valuable processes.

Do human infants “imprint”? This general question led John Bowlby (1969/1982), a British psychoanalyst, to initiate a series of studies of *attachment* in humans. You will see in the upcoming

chapters that research on attachment has flourished, but as you might imagine, attachment in humans is a more complex and lengthy process than it is for geese.

The discovery of imprinting just after birth led researchers to ask if there are other *critical periods* during which an organism is biologically primed to benefit from certain kinds of stimulation or input. You saw in Chapter 1 that, for the most part, humans have *sensitive periods* when they are particularly responsive to stimulation for certain kinds of development. We will encounter the ideas of critical and sensitive periods again in later chapters of this book.

Another area of ethology, **sociobiology**, examines the development of social behaviors that help the entire species survive. Instead of being concerned with how individuals develop across the lifespan, sociobiologists focus on the development of the species and how evolution selects genes that support the survival of the whole group (M. Green & Piel, 2010). Sociobiologists such as Edward O. Wilson (1975, 2006) study the adaptive value of other behavior patterns besides imprinting. For example, are certain mating rituals in animals and humans adaptive? When male mountain goats or lions battle for the right to mate with females, does this ensure that the stronger male is more likely to father strong offspring? Do humans instinctively find certain aspects of babies' appearance (larger heads in relation to their bodies, short arms and legs, big round eyes) endearing so that they feel compelled to protect these helpless creatures? How does the attachment bond between infants and caregivers increase the infants' chances for survival? What is the biological basis of morality? Wilson has been awarded two Pulitzer prizes in literature for his sometimes-controversial writing about biodiversity and the implications of sociobiology.

Psychoanalytic Theories: Freud and Erikson

Sigmund Freud (1856–1939) hoped to become a research scientist, but had to leave medical school for private practice because he needed the money and he realized that being Jewish would hinder his advancement in academia. His interest in neurology and treating nervous disorders led him to work with patients, mostly upper middle-class women with hysteria—a disorder characterized by numbness or paralysis with no known physical causes. By analyzing the dreams and childhood memories of his patients, Freud devised his approach to therapy, called **psychoanalysis**, that helped the patients discover, talk about, and understand emotional conflicts from childhood, buried in their unconscious, that were sources of their anxieties and problems as adults. His work has influenced literature, art, psychology, anthropology, religion, sociology, therapy, and history, to name only a few areas (M. Green & Piel, 2010; P. H. Miller, 2011).

FREUD: ELEMENTS OF PERSONALITY AND STAGES OF PSYCHOSEXUAL DEVELOPMENT. Freud believed that three elements of personality develop during childhood—the id, ego, and superego. The **id** is the screaming infant demanding immediate pleasure and gratification. But immediate gratification is not always possible, and the **ego** develops to deal with this reality, as the infant learns that she is separate from the world and cannot control her surroundings completely. The **superego** develops around age 6 and is the demanding conscience that dictates what “should” and “should not” be done. The ego tries to navigate how to satisfy the id without offending the superego. Freud suggested that all humans have inborn biological, sexual, and aggressive drives that have to be managed and redirected by the ego in order for us to live successfully in civilized societies.

Freud believed that these conflicts between inborn drives and the demands of society result in five stages of psychosexual development—the same five stages in the same order for all people. According to Freud, if the conflicts of one stage are not resolved, an individual can become fixated at that stage. When you hear a comedian refer to someone as an “anal personality,” obsessed with order and control, for example, you are hearing the pop culture version of Freud's idea of fixation at the anal stage—the time when children are experiencing toilet training. Each stage is associated with a different area of the body that provides pleasure. Freud's stages and his assertions about them are:

1. *Oral* (first year of life). The mouth is the focus and pleasure comes from sucking, eating, biting, chewing, and so on. Too little oral gratification leads to anxiety and seeking oral gratification later in life (smoking, nail biting, etc.).

2. *Anal* (ages about 1 to 3). The focus is the anus and pleasure comes from relieving tension by having bowel movements. Society (in the form of parents) insists that children learn to control their bowel movements. If toilet teaching is too harsh or too early, the child may become fixated at the anal stage, and be either very messy (anal expulsive) or very controlled and neat (anal retentive).
3. *Phallic* (ages about 3 to 5). Having solved the toilet learning challenge, boys move on, in Freud's view, to discover the pleasures of the penis. Girls are assumed to discover, to their great sadness and envy, that they do not have a penis. Both boys and girls deal with the challenges of the phallic stage by identifying with and trying to become more like their same-sex parent. With the successful completion of the oral, anal, and phallic stages, Freud believed that personality was pretty much set.
4. *Latency* (ages about 5 to puberty). This is a time of calm. Sexual and aggressive energy flows into schoolwork, sports, clubs, and peer relations. Children tend to play with same-sex friends.
5. *Genital* (adolescence and adulthood). Sexual impulses return with a vengeance. The source of pleasure is in sexual relations, but in a more mature and appropriate way. People are ready for committed relationships with partners and families.

Freud was criticized on a number of fronts for overemphasizing sex and aggression; for basing his theories on the memories of wealthy European women with very specific mental problems; for creating stages of development in childhood without ever studying children; for collecting no experimental data that might support or refute his theories; and even for making up some data. But his concepts of unconscious motivation, the importance of early experiences, parent–child relationships, and psychosexual development have been powerful influences in the field.

As you may recall, the three themes we discussed in Chapter 1 were *shape*, *timing*, and *source* of development. Freud's stage theory puts him in the camp that believes the *shape* of development is discontinuous and qualitative—not continuous and quantitative. He clearly thought *timing* in terms of early experience was critical in shaping the developing child, and with his emphasis on both inborn drives and socialization practices, he had a place for nature and nurture as *sources* of development in his theory.

Freud also was an important influence on the life and work of Erik Erikson (1902–1994), as you will see next.

ERIKSON: STAGES OF PSYCHOSOCIAL DEVELOPMENT. Erikson skipped college, traveled around Europe, and ended up teaching in Vienna. His students were mostly children of therapists learning psychoanalysis from Freud and children of patients who had come to be psychoanalyzed. In Vienna, Erikson not only studied psychoanalysis but also was analyzed by Anna Freud, daughter of Sigmund. Soon after completing his training, Erikson had to flee the terror of the Nazis. He was denied citizenship in Denmark, so he moved to his second choice—New York City. Even though he had never attended college, on the basis of his groundbreaking work, he became a distinguished University Professor at Harvard. Later in his career he worked with the original Dr. Spock—Benjamin Spock, the widely read pediatrician whose books guided many Baby Boomers' parents, including Anita's (M. Green & Piel, 2010).

Erikson's **psychosocial** theory emphasized the emergence of the self, the search for identity, the individual's relationships with others, and the role of culture throughout life. Perhaps his experiences traveling and living in so many different countries and cultures taught Erikson about the centrality of culture and society in human development.

Like Piaget (described later in this chapter) and Freud, Erikson saw development as a passage through a series of stages, each with its particular goals, concerns, accomplishments, and dangers. The stages are interdependent: Accomplishments at later stages depend on how conflicts are resolved in the earlier years. At each stage, Erikson suggests that the individual faces a **developmental crisis**. Each crisis can be resolved by embracing an extreme position or by the healthier and more productive stance of finding a balance between the extreme responses. The way in which the individual resolves each crisis will have a lasting effect on that person's self-image and view of society. Table 2.1 presents the stages in summary form.

TABLE 2.1 • Erikson's Eight Stages of Psychosocial Development

AGE	PSYCHOSOCIAL CRISIS	SIGNIFICANT SOURCES OF PSYCHOSOCIAL CONFLICT
0–1	Trust versus mistrust	Mother
2–3	Autonomy versus shame and doubt	Both parents
3–6	Initiative versus guilt	Family members
7–12	Industry versus inferiority	Neighborhood and school
12–18	Identity versus identity diffusion	Peer groups, out-groups, leadership models
20s	Intimacy and solidarity versus isolation	Cooperation with partner in friendship, recreation, production, sex
20s–50s	Generativity versus stagnation	Sharing child rearing, dividing labor, household responsibilities
50s and Beyond	Integrity versus despair	Finding oneself within humanity, civilization, generations

Source: Green, M. & Piel, J. Theories of Human Development: A Comparative Approach, 2nd Ed. © 2010, p. 93. Reproduced by permission of Pearson Education, Inc., Upper Saddle River, NJ.

1. *Trust versus mistrust.* According to Erikson, infants will develop a sense of trust if their needs for food and care are met with comforting regularity and responsiveness from caregivers. In this first year, infants are just beginning to learn that they are separate from the world around them, so they must trust the aspects of their world that are beyond their control but also learn that some situations should not be trusted. They need a balance of being able to trust and mistrust appropriately—either extreme is dysfunctional (Isabella & Belsky, 1991; Posada et al., 2002).
2. *Autonomy versus shame and doubt* marks the beginning of self-control and self-confidence. Young children (about ages 2 to 3) begin to assume important responsibilities for self-care such as feeding, toileting, and dressing. Parents must tread a fine line; they must be protective—but not overprotective. If parents are not reassuring and fail to reinforce the child's efforts to master basic motor and cognitive skills, children may doubt their abilities and feel shame. In the extreme, Erikson believed these children will lack confidence in their own abilities throughout life. Of course, some doubt is appropriate if the task is too difficult or dangerous—again the need for balance.
3. *Initiative versus guilt.* The challenge of this period (from about ages 3 to 6) is to maintain a zest for activity and at the same time understand that not every impulse can be acted on. Again, adults must tread a fine line, this time in providing supervision without interference. If children are not allowed to do things on their own, a sense of guilt may develop; they may come to believe that what they want to do is always “wrong.” The *Connecting with Children* on the next page suggestions provide ways of encouraging initiative.
4. *Industry versus inferiority.* This is the stage between the ages of 7 and 12. Cognitive development is proceeding rapidly. Children can process more information faster, and their memory spans are increasing. They are beginning to see the relationship between perseverance and the pleasure of a job completed. In modern societies, the ability to move between the worlds of home, neighborhood, and school and to cope with academics, group activities, and friends will lead to a growing sense of competence in children. Difficulty with these challenges can result in feelings of inferiority. Children must master new skills and work toward new goals, while being compared to others and risking failure. Now children must also reestablish *trust*, *autonomy*, and *initiative* in the unfamiliar school setting. They must learn which new adults they can *trust*, learn to act *autonomously* in this more complex situation, and learn to *initiate* actions in ways that fit the new rules of school. The *Connecting with Children* on the next page suggestions give some ideas.
5. *Identity versus identity diffusion* is the conflict for adolescents (about ages 12 to 18). Cognitive processes are expanding as the young adolescents develop capabilities for abstract thinking



The children in this video are preparing for their class lunch. As you watch, note the ways the children demonstrate a developed sense of autonomy and an emerging sense of initiative.

CONNECTING WITH CHILDREN

Guidelines for Teachers and Families:
Encouraging Initiative and Industry in Children



Be tolerant of accidents and mistakes, especially when children are attempting to do something on their own.

Examples

1. Use cups and pitchers that make it easy to pour and hard to spill.
2. Recognize the attempt, even if the product is unsatisfactory.
3. If mistakes are made, show the child how to clean up, repair, or redo.

Encourage children to make and to act on choices.

Examples

1. Encourage children to select an activity or game.
2. As much as possible, avoid interrupting children who are very involved in what they are doing.
3. When children suggest an activity, try to follow their suggestions or incorporate their ideas into ongoing activities.
4. Offer positive choices: Instead of saying, "You can't have the cookies now," ask, "Would you like the cookies after lunch or after naptime?"

Make sure that young children have a chance to experience success.

Examples

1. In learning anything new, move in small steps.
2. Teachers, avoid competitive games when the range of abilities in the class is great.

Encourage make-believe with a wide variety of roles.

Examples

1. At home or in school, include costumes and props that go along with stories children enjoy. Encourage children to

act out the stories or make up new adventures for favorite characters.

2. Teachers, monitor the children's play to be sure no one monopolizes playing "teacher," "Mommy," "Daddy," or other heroes.

Make sure that children have opportunities to set and work toward realistic goals.

Examples

1. In doing chores or homework, encourage children to set a goal for 10 minutes, then for longer and longer periods of time.
2. Praise children for doing their best, not for being perfect.

Give children a chance to show their independence and responsibility.

Examples

1. Tolerate honest mistakes.
2. Delegate tasks appropriate to the child's abilities such as watering plants, caring for pets, or cleaning up after dinner.
3. Don't compare children to their siblings or friends, but to their own improvement.

Teachers, provide support to students who seem discouraged.

Examples

1. Use individual charts and contracts that show student progress.
2. Keep samples of earlier work so students can see their improvement.
3. Give awards for most improved, most helpful, most hardworking.

and for understanding the perspectives of others. Even greater changes are taking place in their physical development as they approach puberty. So, along with their developing minds and bodies, adolescents must confront the central issue of developing an identity that will provide a firm basis for adulthood. If adolescents fail to integrate all these aspects and choices, or if they feel unable to choose at all, identity diffusion threatens.

6. *Intimacy versus isolation*, like all the crises of Erikson's stages of adulthood, involves the quality of human relations. **Intimacy** in this sense refers to a willingness to relate to another person on a deep level, to have a relationship based on more than mutual need. Someone who has not achieved a sufficiently strong sense of identity tends to fear being overwhelmed or swallowed up by another person and may retreat into isolation. Of course, as with all the stages, a healthy resolution involves a balance—being capable of intimate relationships without being completely dependent on or lost in them.
7. *Generativity versus stagnation* during the middle adult years extends the ability to care for another person to caring for and guiding the next generation and future generations. While **generativity** frequently refers to having and nurturing children, it has a broader meaning. Productivity and creativity are essential features.

8. *Integrity versus despair* is the last of Erikson's stages and involves coming to terms with death. Achieving **integrity** means consolidating your sense of self and fully accepting its unique and now unalterable history. Those unable to attain a feeling of fulfillment sink into despair.

Erikson's work helped start the lifespan development approach, and his theories have been especially useful in understanding adolescence. But the theory, although creative and appealing, is based on observations, generalizations, and abstract theoretical claims, so it is virtually impossible to test. In addition, Erikson's theory is mostly descriptive—he describes what happens and the influences that are involved but does not discuss how or why these factors effect change. If we don't know why failure to resolve a conflict at one stage causes problems at the other stages, we don't really know if the conflict-resolution model is valid. Maybe other factors are responsible and conflict resolution has nothing to do with the difficulties and accomplishments of later life (P. H. Miller, 2011). The results of research on infant attachment (Chapter 4) and on adolescents' identity statuses (Chapter 13) are consistent with Erikson's theory, however (M. Green & Piel, 2010).

In terms of the three themes in Chapter 1—*shape, timing, source* of development—Erikson tended to emphasize qualitative changes in development over time, the importance of timing in resolving the appropriate conflicts as they arose predictably throughout life, and nurture and socialization within the culture more than nature as the source of development.

Behavioral Learning Theories: Classical and Operant Conditioning

A fundamental idea behind many of the learning theories of development is that most of the changes in children's cognitive and emotional/social development, and even some physical changes, are consequences of learning: Nurture is more important than nature. Children learn language, problem solving, taking the perspective of others, and ways of coping with fears, for example. Learning theorists criticized Freud's ideas about unconscious motivations and fixations because these processes could not be observed and studied scientifically. The psychoanalytic explanations could not be proved wrong because they were just interesting stories about causes—and the stories couldn't be tested. Learning theories developed to take a more scientific look at change in something that *can* be observed—*behaviors*—so these theories are often classified under the general category of **behaviorism**.

Two major theories, classical conditioning and operant conditioning, explain how behaviors are learned. **Classical conditioning** focuses on the learning of often *involuntary* emotional or physiological responses such as fear, increased muscle tension, salivation, or sweating. **Operant conditioning** is the learning process involved in *intentional* behavior such as having a tantrum to get your way or improving your dancing through practice, so operant conditioning applies to many behaviors of interest in teaching.

CLASSICAL CONDITIONING. Through the process of classical conditioning, humans and animals can be trained to react to a stimulus that previously had no effect—or a very different effect—on them. Classical conditioning was discovered in the 1920s by Ivan Pavlov, a Russian physiologist who was trying to determine how long it took a dog to salivate (secrete digestive juices) after it had been fed. But the intervals of time kept changing. Pavlov decided to make a detour from his original experiments and examine these unexpected interferences in his work. In one of his first experiments, Pavlov began by sounding a tuning fork (a *neutral stimulus*) and recording a dog's response. As expected, there was no salivation. Then Pavlov fed the dog; the response was salivation. The food was an *unconditioned stimulus (US)*, and the salivation was an *unconditioned response (UR)*, because no prior training, or “conditioning,” was needed to establish the natural connection between food (US) and salivation (UR).

Then Pavlov demonstrated that a dog could be conditioned to salivate after hearing the tuning fork. He sounded the fork and then quickly fed the dog. After Pavlov repeated this several times, the dog began to salivate after hearing the sound but before receiving the food. The sound had become a *conditioned stimulus (CS)* that could bring forth salivation by itself. The response of salivating after the tone was now a *conditioned response (CR)*.

An early American behaviorist, John B. Watson, used Pavlov's ideas to develop a theory of child development. He believed that he could shape children by using classical conditioning techniques and even conditioned an 11-month-old boy, known as "Little Albert," to fear furry animals and some fur coats. The experiment has been widely condemned because Watson never even told Little Albert's mother what he was doing, nor did he try to "uncondition" the fear response.

But if you think that Pavlovian conditioning is of historical interest only, consider this excerpt from *USA Today* describing an advertising campaign for products aimed at "Gen Y"—young people born between 1977 and 1994:

Mountain Dew executives have their own term for this [advertising strategy]: the Pavlovian connection. By handing out samples of the brand at surfing, skateboard and snowboard tournaments, "There's a Pavlovian connection between the brand and the exhilarating experience," says Dave Burwich, a top marketing executive at Pepsi, which makes Mountain Dew. (Horovitz, 2002, p. B2)

It is possible that many of our emotional reactions to various situations have been learned in part through classical conditioning. Physicians have a term, "white coat syndrome," that describes people whose blood pressure (an involuntary response) goes up when it is tested in the doctor's office, usually by someone in a white coat. Classical conditioning has implications for parents and teachers as well as marketing managers. Procedures based on classical conditioning also can be used to help people learn more adaptive emotional responses, as you will see in upcoming chapters when we discuss children's fears.

OPERANT CONDITIONING. In the 1930s, Edward Thorndike established the basis for operant conditioning in his experiments with cats that learned to escape from boxes by *operating* on their environment—opening a latch. Thorndike decided that one important law of learning was the *law of effect*: Any act that produces a satisfying effect in a given situation (e.g., access to food for a trapped cat) will tend to be repeated in that situation. But the person generally thought to be responsible for developing the concept of operant conditioning is B. F. Skinner (1953).

Like so many others, Skinner did not start out to be a psychologist. He majored in English and tried to write fiction, but gave that up in 1928 and enrolled in Harvard to study psychology (M. Green & Piel, 2010). As he studied learning, Skinner concluded that classical conditioning accounts for only a small portion of learned behaviors; it is only relevant to how existing behaviors might be associated or paired with new stimuli. Classical conditioning does not explain how new operant behaviors (behaviors that *operate* on the environment) are acquired.

According to Skinner's view, **consequences** determine to a great extent whether a person will repeat the behavior that led to the consequences. The type of consequences can strengthen or weaken behaviors. Consequences that strengthen are called *reinforcers*, and consequences that weaken are called *punishers*. Although a reinforcer is commonly understood to mean a "reward," this term has a particular meaning in psychology. A **reinforcer** is any consequence that strengthens the behavior it follows. Whenever you see a behavior persisting or increasing over time, you can assume the consequences of that behavior are reinforcers for the individual involved (Landrum & Kauffman, 2006).

There are two types of reinforcement. When the consequence that strengthens a behavior is the *appearance (addition)* of a new stimulus, the situation is defined as **positive reinforcement**. Examples include pecking on the red key (producing food for a pigeon) or wearing a new outfit (producing many compliments for you). In contrast, when the consequence that strengthens a behavior is the *disappearance (subtraction)* of a stimulus, the process is called **negative reinforcement**. If a particular action leads to the disappearance of an **aversive** (unpleasant) situation, the action is likely to be repeated in a similar situation. A common example is the car seatbelt buzzer. As soon as you put on your seatbelt, the irritating buzzer stops. You are likely to repeat this behavior (putting on the seatbelt) in the future because the action made an aversive stimulus (buzzer) disappear. The "negative" in negative reinforcement does not imply that the behavior being reinforced is necessarily negative or that the consequence feels bad. The meaning is closer to that of "negative"

numbers—something is subtracted. Associate *positive* and *negative* reinforcement with *adding* or *subtracting* something following a behavior that has the effect of reinforcing (strengthening) the behavior.

Negative reinforcement is often confused with punishment. The process of reinforcement (positive or negative) always involves strengthening behavior. **Punishment**, on the other hand, involves *decreasing* or *suppressing* behavior. A behavior followed by a punisher is *less* likely to be repeated in similar situations in the future. Again, it is the *effect* that defines a consequence as punishment, and different people have different perceptions of what is punishing. Some children may find being sent to their rooms punishing, whereas others wouldn't mind at all.

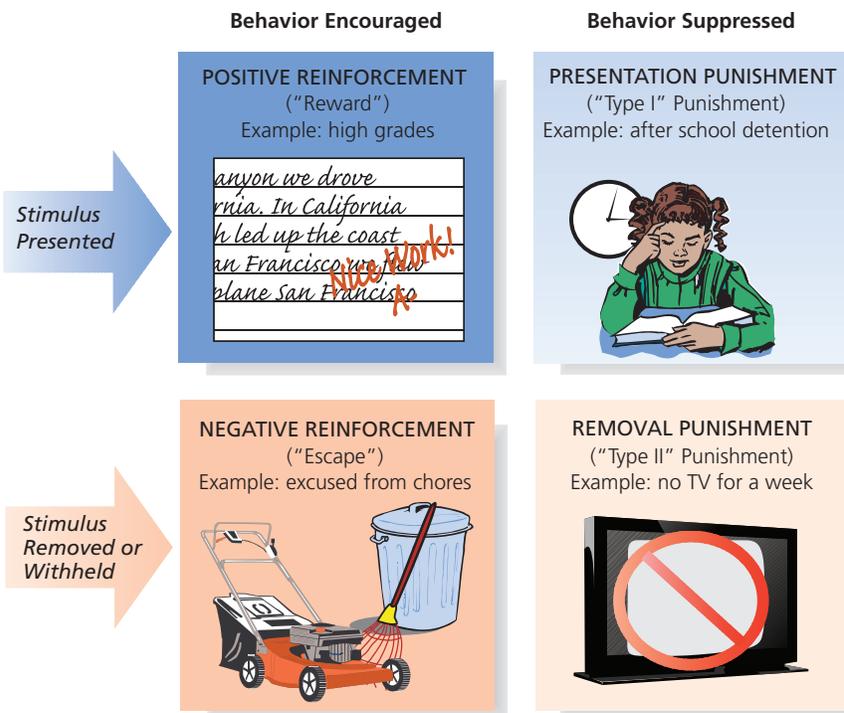
Like reinforcement, punishment may take one of two forms. The first type has been called *Type I punishment*, but this name isn't very informative, so we use the term **presentation punishment**. It occurs when the appearance of a stimulus following the behavior suppresses or decreases the behavior. When parents scold children or when coaches make the team run extra laps because they broke the rules, they are using presentation punishment. We call the other type of punishment (*Type II punishment*) **removal punishment** because it involves removing a stimulus. When parents or teachers take away privileges (no TV, no driving, no recess) after a young person has behaved inappropriately, they are applying removal punishment. With both types, the effect is to decrease the behavior that led to the punishment. Figure 2.1 summarizes the two kinds of reinforcement and the two kinds of punishment.

Operant conditioning is the basis for many programs designed to teach or manage children at home or in classrooms and is especially prominent in special education (Alberto & Troutman,

FIGURE 2.1

TWO KINDS OF REINFORCEMENT AND TWO KINDS OF PUNISHMENT

Negative reinforcement and punishment are often confused. It may help you to remember that reinforcement is always associated with increases in behaviors, and punishment always involves decreasing or suppressing behavior.



2009; Canter & Canter, 1992; Foote, 2003; Lane, Falk, & Wehby, 2006; Patterson & Forgatch, 2005). We will look at some of these programs in the upcoming chapters. There are also some important cautions in using behavioral principles with children—we will consider these too in later chapters.

Bandura's Social Learning and Social Cognitive Theory

Albert Bandura's (1925—) life story should be a movie. You could say he lived the American dream, except that he is from Canada. His parents immigrated to farm the rugged land of northern Alberta. Bandura's parents never went to school, but they valued education. His father taught himself to read in three languages, giving young Albert a great model of self-regulated learning—a concept that figures prominently in social cognitive theory today. On the way to finishing high school, Bandura worked many jobs, including as a carpenter at a furniture factory and a road worker on the Alaska Highway in the Yukon. He finished his undergraduate degree at the University of British Columbia in 3 years, even though he had to cram all his classes into the morning to have time for his afternoon jobs. Because he needed a morning class to fill one time slot, he enrolled in introductory psychology and found his future profession (Bandura, 2006b, p. 46). Next was graduate school, and then he joined the faculty at Stanford in 1953—at the age of 28. Sixty years later, he is the Emeritus David Starr Jordan Professor of Social Science in Psychology at Stanford, but now some of his students are the children of his former students.

SOCIAL LEARNING THEORY. Early in his career, Bandura noted that the traditional behavioral views of learning were accurate—but incomplete—because they gave only a partial explanation of learning and overlooked important elements, particularly social influences, so he developed *social learning theory*.

To explain some limitations of the behavioral model, Bandura distinguished between the *acquisition of knowledge* (learning) and the *observable performance based on that knowledge* (behavior). In other words, Bandura suggested that we all might know more than we show. This was demonstrated in one of Bandura's early studies (1965). Preschool children saw a film of a model kicking and punching an inflatable “Bobo” doll. One group saw the model rewarded for the aggression, another group saw the model punished, and a third group saw no consequences. When they were moved to a room with the Bobo doll, the children who had seen the punching and kicking reinforced on the film were the most aggressive toward the doll. Those who had seen the attacks punished were the least aggressive. But when the children were promised rewards for imitating the model's aggression, all of them demonstrated that they had learned the behavior.

Incentives can affect performance. Even though learning may have occurred, it may not be demonstrated until the situation is appropriate or there are incentives to perform, like those rewards promised to the preschool students for imitating the model in the Bobo doll study. This might explain why some adolescents don't perform “bad behaviors” such as swearing or smoking that they all see modeled by adults, peers, and the media. Personal consequences may discourage performing the behaviors.

SOCIAL COGNITIVE THEORY. In his later work, Bandura has focused on cognitive factors such as beliefs, self-perceptions, and expectations, so his theory is called a social cognitive theory (Bandura, 1986, 1997). **Social cognitive theory** distinguishes between enactive and vicarious learning. *Enactive learning* is learning by doing and experiencing the consequences of your actions. This may sound like operant conditioning all over again, but it is not, and the difference has to do with the role of consequences. Proponents of operant conditioning believe that consequences strengthen or weaken behavior. In enactive learning, however, consequences are seen as providing *information*. Our interpretations of the consequences create expectations, influence motivation, and shape beliefs about our own capabilities (Bandura, 2006a, b; Schunk, 2004).

Vicarious learning is learning by observing others. People and animals can learn merely by observing another person or animal learn, and this fact challenges the behaviorist idea that cognitive factors are unnecessary in an explanation of learning. If people can learn by watching, they must be focusing their attention, constructing images, remembering, analyzing, and making decisions

that affect learning. Thus, much is going on mentally before performance and reinforcement can even take place.

A key idea in social cognitive theory that you will encounter often in this book is self-efficacy—our beliefs about our personal competence or effectiveness *in a given area*. Bandura (1997) defines **self-efficacy** as “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (p. 3). He suggests these predictions about possible outcomes of behavior are critical for learning because they affect motivation. Research in health and medicine, sports and exercise, nutrition, clinical psychology, counseling, educational psychology, child development, addictions, weight loss, and many other areas have identified self-efficacy beliefs as powerful elements of motivation.

Information Processing Perspectives

The behavioral views of learning were powerful forces in psychology during the 1940s and 1950s, but then the computer revolution, breakthroughs in understanding language development, and Piaget’s work (discussed in the next section) all stimulated cognitive research. Evidence accumulated indicating that people plan their responses, use strategies to help themselves remember, and organize the materials they are learning in their own unique ways (G. A. Miller, Galanter, & Pribram, 1960), so the way people process and remember information became an important focus for research.

THE INFORMATION PROCESSING MODEL. Early **information processing** views of learning used the computer as a model. Like a computer, people take in information and organize it in relation to what they already know (*encoding*), store the information (*memory*), get the information when needed (*retrieval*), and guide all these information processing stages through *executive controls*. Also like a computer, the human mind is limited in the amount of information it can process and the speed of processing—the system has a *limited capacity*. It can deal with only so much information, especially new information, at one time. Computers can handle more information faster, but they are not as creative or flexible as the human mind (Atkinson & Shiffrin, 1968; Bjorklund, 2005; Neisser, 1976).

Sensory memory is the initial processing that transforms incoming stimuli (sights, sounds, smells, etc.) into information so we can make sense of them. We hold information, in the form of images or sounds or other codes, for only a very few seconds. **Attention** (maintaining cognitive focus on something and resisting distractions) is critical at this stage. What is not attended to is lost. But attention is *selective*. What we pay attention to is guided to a certain extent by what we already know and what we need to know, so attention is involved in and influenced by all three memory processes—sensory, working, and long-term.

The working space of the memory system is called (surprise) **working memory**. It is the interface where new information is held temporarily (no more than 20 seconds or so) and combined with knowledge from long-term memory, to solve problems or comprehend a lecture, for example. Working memory “contains” what you are thinking about at the moment. You may have heard the term **short-term memory**. This is similar to working memory but refers only to the storage space available. Working memory includes both temporary storage and active processing; it is the process or stage in which active mental effort is applied to new and old information.

Because information in working memory is fragile and easily lost, it must be kept activated to be retained. To keep information activated in working memory for longer than 20 seconds, most people keep rehearsing the information mentally—repeating it over and over, called **maintenance rehearsal**. Another way to hold onto new information is **elaborative rehearsal**, connecting the information you are trying to remember with something you already know. For example, if you meet someone at a party whose name is the same as your brother’s, you don’t have to repeat the name to keep it in memory; you just have to make the connection. Rehearsal is one form of *executive control*—one of the processes that plans, monitors, and guides the flow of information throughout the whole information processing system. Selective attention is another executive control process.

Working memory holds the information that is currently activated, such as a telephone number you have just found and are about to dial. **Long-term memory** holds the information that is



The students and teacher discuss multiple meanings of a word. As you watch, consider the steps the teacher takes to focus short-term memory and help students process information to keep it in long-term memory.

well learned, such as all the song lyrics you know. Information gets into long-term memory when it is well rehearsed, elaborated, organized, and connected to existing knowledge. The more completely information is processed, the better are our chances of remembering it.

INFORMATION PROCESSING AND DEVELOPMENT. With the rise of information processing perspectives on learning and memory, developmental psychologists began to apply the computer model to changes in children's thinking, focusing on the child's developing information processing skills such as attention, memory capacity, and learning strategies. As children mature and their brains develop, they are better able to focus their attention, process information more quickly, hold more information in memory, and use thinking strategies more easily and flexibly. For example, most children spontaneously discover rehearsal around age 5 or 6. Siegler (1998) describes a 9-year-old boy who witnessed a robbery, then mentally repeated the license number of the getaway car until he could give the number to the police. Children are 10 to 11 years old before they have adult-like working memories.

Even though the range of developmental theories that emphasize learning is wide—from behaviorism to information processing—most learning theories of development share similar stances on the themes described in Chapter 1: *shape*, *timing*, and *source* of development. The shape of development is seen as quantitative and continuous because new learning expands development. Learning theories are less concerned about critical or sensitive periods for learning, except as sensitive periods for brain development (discussed in Chapters 5, 8, and 11) affect learning. Finally, the source of development is learning based on interactions with the environment, so nurture is very important. Both social cognitive theory and information processing theory see an important role for the individual's knowledge, but much of this has been learned over time. We turn next to a theory that takes a different stance on these issues—the work of Jean Piaget.

Cognitive Stages and Structures: Jean Piaget

Swiss psychologist Jean Piaget was a real prodigy. In his teens, he published so many scientific papers on mollusks (marine animals such as oysters, clams, octopuses, snails, and squid) that he was offered a job as the curator of the mollusk collection at the Museum of Natural History in Geneva. He told the museum officials that he wanted to finish high school first. For a while Piaget worked in Alfred Binet's laboratory in Paris, developing intelligence tests for children. There he became intrigued by children's *wrong* answers and wondered about the thinking behind the answers—a question that intrigued him his whole life (M. Green & Piel, 2010). During his long career, Piaget devised a model describing how humans go about making sense of their world by gathering and organizing information from infancy to adulthood (Piaget, 1954, 1963, 1970a, 1970b).

According to Piaget (1954), certain ways of thinking that are quite simple for an adult are not so simple for a child. For example, Piaget asked a 9-year-old:

What is your nationality?—*I am Swiss.*—How come?—*Because I live in Switzerland.*—
Are you also a Genevan?—*No, that's not possible. I'm already Swiss, I can't also be Genevan.*
(Piaget, 1965/1995, p. 252)

You encountered this question in the overview for Chapter 1. Imagine teaching this student geography. The student has trouble with classifying one concept (Geneva) as a subset of another (Switzerland). There are other differences between adult and child thinking. Let's examine why.

INFLUENCES ON DEVELOPMENT. Cognitive development is much more than the addition of new facts and ideas to an existing store of information. According to Piaget, our thinking processes change radically, although slowly, from birth to maturity because we constantly strive to make sense of the world. How do we do this? Piaget identified four factors—*biological maturation*, *activity*, *social experiences*, and *equilibration*—that interact to influence changes in thinking (Piaget, 1970a).

One of the most important influences on the way we make sense of the world is *maturation*, the unfolding of the biological changes we experience. Parents have little impact on this aspect of cognitive development, except to be sure that children get the nourishment and care they need to be healthy.

Activity is another influence. With physical maturation comes the increasing ability to act on the environment and learn from it. When a young child’s coordination is reasonably developed, for example, the child may discover principles about balance by experimenting with a seesaw. Thus, as we act on the environment—as we explore, test, observe, and eventually organize information—we are likely to alter our thinking processes at the same time.

As we develop, we are also interacting with the people around us. According to Piaget, our cognitive development is influenced by *social transmission*, or learning from others. Without social transmission, we would need to reinvent all the knowledge already offered by our culture. The amount people can learn from social transmission varies according to their stage of cognitive development.

Maturation, activity, and social transmission all work together to influence cognitive development. How do we respond to these influences?

BASIC TENDENCIES IN THINKING. As a result of his early research in biology, Piaget concluded that all species inherit two basic tendencies, or “invariant functions,” *organization* (arranging and rearranging of behaviors and thoughts into coherent systems) and *adaptation* (adjusting to the environment).

People *organize* their thinking processes into psychological structures, which are systems for understanding and interacting with the world. We continually combine and coordinate simple structures, developing more sophisticated and thus more effective structures. Very young infants, for example, can either look at an object or grasp it when it comes in contact with their hands. They cannot coordinate looking and grasping at the same time. As they develop, however, infants *organize* these two separate behavioral structures into a coordinated higher-level structure of looking at, reaching for, and grasping the object. They can, of course, still use each structure separately (Piaget, 1970a, 1975/1985).

Piaget gave a special name to these structures: **schemes**. In his theory, schemes are organized patterns of behavior that can be repeated and generalized. Schemes may be very small and specific, for example, the sucking-through-a-straw scheme, or they may be larger and more general—the drinking scheme. As a person’s actions become more organized and new schemes develop, behavior also becomes more sophisticated and better suited to the environment.

In addition to the tendency to organize their psychological structures, people also inherit the tendency to *adapt* to their environment. Two basic processes are involved in adaptation: assimilation and accommodation. **Assimilation** takes place when people use their existing schemes to make sense of events in their world. Assimilation involves trying to understand something new by fitting it into what we already know. At times, we may have to distort the new information to make it fit. For example, the first time many children see a skunk, they call it a “kitty.” They try to match the new experience with an existing scheme for identifying animals (Piaget, 1978).

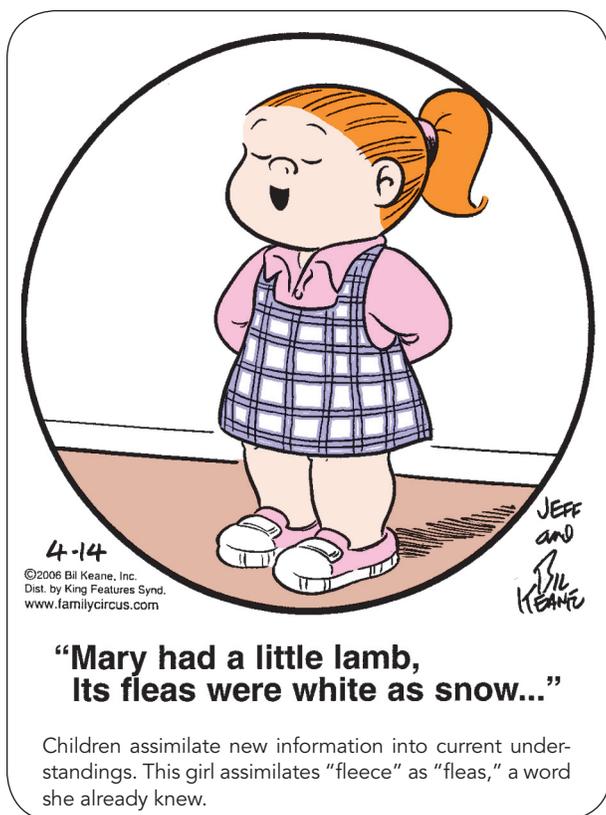
Accommodation occurs when a person must change existing schemes to respond to a new situation. If data cannot be made to fit any existing schemes, then more appropriate structures must be developed. We adjust our behavior to fit the new information, instead of adjusting the information to fit our behavior. Children demonstrate accommodation when they add the scheme for recognizing skunks to their other systems for identifying animals.

People adapt to their increasingly complex environments by using existing schemes whenever these schemes work (assimilation) and by modifying and adding to their schemes when something new is needed (accommodation). In fact, both processes are required most of the time. Even using an established pattern such as sucking through a straw may require some accommodation. For example, if you have tried drinking juice from box packages, you know that you have to add a new skill to your sucking scheme—don’t squeeze the box or you will shoot juice through the straw, straight up into the air and into your lap. Whenever new experiences are assimilated into an existing scheme, the scheme is enlarged and changed somewhat, so assimilation involves some accommodation.

There are also times when neither assimilation nor accommodation is used. If people encounter something that is too unfamiliar, they may ignore it. Experience is filtered to fit the kind of thinking a person is doing at a given time. For example, if you overhear a conversation in a foreign



The children in this class, while studying tadpoles, are learning something new about growth. They can assimilate the idea that the tadpole grows legs, but they need to accommodate their concept of growth to understand why the tadpole’s tail gets smaller.



language, you probably will not try to make sense of the exchange unless you have some knowledge of the language.

EQUILIBRATION. According to Piaget, organizing, assimilating, and accommodating can be viewed as a kind of complex balancing act. In his theory, the actual changes in thinking take place through the process of **equilibration**—the act of searching for a balance. Piaget assumed that people continually test the adequacy of their thinking processes in order to achieve that balance. Briefly, the process of equilibration works like this: If we apply a particular scheme to an event or situation and the scheme works, then equilibrium exists. If the scheme does not produce a satisfying result, then **disequilibrium** exists, and we become uncomfortable. This motivates us to keep searching for a solution through assimilation and accommodation, and thus our thinking changes and moves ahead. Of course, the level of disequilibrium must be just right or optimal—too little and we aren’t interested in changing, too much and we may be too anxious to change (Piaget, 1975/1985).

FOUR STAGES OF COGNITIVE DEVELOPMENT. Now we turn to the actual differences that Piaget hypothesized for children as they grow. Piaget believed that all people pass through the same four stages (sensorimotor, preoperational, concrete operational, and formal operational) in exactly the same order. These stages are generally associated with specific ages, as shown in Table 2.2, but these are only general guidelines, not labels for all children of a certain age. Piaget noted that individuals may go through long periods of transition between stages and that a person may show characteristics of one stage in one situation, but characteristics of a higher or lower stage in other situations. Therefore, knowing a student’s age is

never a guarantee that you know how the child will think (Orlando & Machado, 1996). We will look at each stage more fully in the upcoming Chapters 4, 6, 9, and 12, on cognitive development.

TABLE 2.2 • Piaget’s Four Stages of Cognitive Development

STAGE AND APPROXIMATE AGE	DESCRIPTION	DEVELOPING CHARACTERISTICS
Sensorimotor 0–2 years	Children know the world through actions on the world—sucking, throwing, pounding, etc. They know what they can see. Objects out of sight are out of mind—they don’t exist for the infant.	Begins to make use of imitation, memory, and thought. Begins to recognize that objects do not cease to exist when they are hidden. Moves from reflex actions to goal-directed activity.
Preoperational 2–7 years	Children can use symbols such as pretending and language, but thinking relies on appearances. At this stage, a child may think that five coins spread out are more coins than the same five pushed close together.	Gradually develops use of language and ability to think in symbolic form. Able to think operations through logically in one direction. Has difficulties seeing another person’s point of view.
Concrete Operational 7–11 years	Children can think about and reverse actions mentally, as long as they are thinking about objects they have experienced or dealt with personally, so they can mentally move the coins (or buttons, or blocks, etc.) apart and together to know that the quantity does not change just because the appearance changes.	Able to solve concrete (hands-on) problems in logical fashion. Understands laws of conservation and is able to classify and seriate. Understands reversibility.
Formal Operational 11–adult	Children can perform mental operations on abstract ideas and objects that are only imagined—objects or events they have never encountered personally.	Able to solve abstract problems in logical fashion. Becomes more scientific in thinking. Develops concerns about social issues, identity.

How would Piaget address the three themes in Chapter 1: *shape*, *timing*, and *source* of development? You know Piaget believed that the shape of development was in stages; he described qualitative changes in thinking. Timing—early experience and critical periods—were not significant features of Piaget’s theory; and both nature (maturation and the “invariant functions” of organization and adaptation) and nurture (activity and social transmission) were essential sources of development in his theory.

LIMITATIONS OF PIAGET’S THEORY. Although most psychologists agree with Piaget’s insightful descriptions of children’s thinking, many disagree with his explanations of *how* thinking develops. Some psychologists have questioned the existence of four separate stages of thinking, even though they agree that children do go through the changes that Piaget described. One problem with the stage model is the lack of consistency in children’s thinking. For example, children can conserve number (the number of blocks does not change when they are rearranged) a year or two before they can conserve weight (a ball of clay does not change volume when you flatten it). Why can’t they use conservation consistently in every situation? In fairness, we should note that in his later work, even Piaget put less emphasis on *stages* of cognitive development and gave more attention to how thinking *changes* through equilibration (Piaget, 1975/1985).

Piaget seemed to underestimate the abilities of young children, and his theory does not explain how even young children can perform at an advanced level in certain areas in which they have highly developed knowledge and expertise. An expert 9-year-old chess player may think abstractly about chess moves, whereas a novice 20-year-old player may have to resort to more concrete strategies to plan and remember moves (Newcombe, 2011; Siegler & Alibali, 2005).

One final criticism of Piaget’s theory is that it overlooks the important effects of the child’s cultural and social group. Children in Western cultures may master formal scientific thinking because this is the kind of thinking required in Western schools (Geary, 1998). Even concrete operations such as classification may develop differently in different cultures. For example, when individuals from the Kpelle people of Africa were asked to sort 20 objects, they created groups that made sense to them—a hoe with a potato, a knife with an orange. The experimenter could not get the Kpelle to change their categories; they said this is how a wise man would do it. Finally the experimenter asked in desperation, “Well, how would a fool do it?” Then the subjects promptly created the four neat classification piles the experimenter had expected—food, tools, and so on (Rogoff & Morelly, 1989). The ways that Piaget and others interviewed children and assessed cognitive development probably seemed unfamiliar and irrelevant to children in nontraditional cultures—and language could have been a problem as well (Owusu-Bempah & Howitt, 2000). We have to understand children’s thinking in the context of their own culture so that we do not make the mistake of viewing cultural differences as deficits—remember the wisdom of the Kpelle and their knowledge of “how a fool would do it.”

NEO-PIAGETIAN THEORIES. Some developmental psychologists have devised **neo-Piagetian theories** that retain Piaget’s insights about children’s construction of knowledge and the general trends in children’s thinking but add findings from information processing about the role of specific knowledge, attention, memory, strategies, and brain maturation (Kail, 2004). According to Robbie Case (1998), young children often use reasonable but incorrect strategies to solve problems because of their limited memories. They try to simplify the task by ignoring important information or skipping steps to reach a correct solution. This puts less strain on memory.

Case (1992a, 1998) devised an explanation of cognitive development suggesting that children develop in stages within specific domains such as numerical concepts, spatial concepts, social tasks, storytelling, reasoning about physical objects, and motor development. As children practice using the schemes in a particular domain (e.g., using counting schemes in the number concept area), it takes less attention to accomplish the schemes; they become more automatic because the child does not have to “think so hard” about it. This frees up mental resources and memory to do more. The child now can combine simple schemes into more complex ones and invent new schemes when needed (assimilation and accommodation in action).

We now turn to several theories that are very prominent today—contextual and dynamic explanations of development.

✓ Check your understanding in the Pearson etext

CONTEXTUAL AND DYNAMIC SYSTEMS THEORIES

As you saw in Chapter 1, developmental theories today acknowledge the importance of context and the coaction of many factors in development: Questions about nature *or* nurture became nature *and* nurture acting together. In this section we examine the theories of Vygotsky, Bronfenbrenner, and Thelen.

Vygotsky: Sociocultural Theory

Lev Semenovich Vygotsky (1896–1934) was a Russian psychologist who emphasized context, history, and culture in his **sociocultural theory** (also called *sociohistoric*). Vygotsky was only 37 years old when he died of tuberculosis, but during his brief life he produced over 100 books and articles; many are now available in translation (1978, 1986, 1987a, b, 1993, 1997). Vygotsky’s work began when he was studying learning and development to improve his own teaching. He went on to write about language and thought, the psychology of art, learning and development, and educating students with special needs (Karpov, 2006; Kozulin, 2003; Smagorinsky, 2012; Wink & Putney, 2002).

Vygotsky believed that human activities take place in cultural settings and cannot be understood apart from these settings. One of his key ideas was that our specific mental structures and processes could be traced to our interactions with others. These social interactions are more than simple influences on cognitive development; they actually create our cognitive structures and thinking processes (Palincsar, 1998). “Vygotsky conceptualized development as the transformation of socially shared activities into internalized processes” (John-Steiner & Mahn, 1996, p. 192). We will examine three themes in Vygotsky’s writings that explain how social processes form learning and thinking: the social sources of development; the role of tools in learning and development, especially the tool of language; and the zone of proximal development (Vygotsky, 1978, 1986, 1993; Wertsch & Tulviste, 1992).

THE SOCIAL SOURCES OF DEVELOPMENT. Vygotsky assumed that “every function in a child’s cultural development appears twice: first, on the social level and later on the individual level; first between people (interpsychological) and then inside the child (intrapsychological)” (1978, p. 57). In other words, higher mental processes first are **co-constructed** during shared activities between the child and another person. Then the processes are internalized by the child and become part of that child’s cognitive development. For example, children first use language in activities with others, to regulate the behavior of the others (“No nap!” or “I wanna cookie.”). Later, however, the child can regulate her own behavior using private speech (“careful—don’t spill”), as you will see in Chapter 6. So, for Vygotsky, social interaction was more than influence; it was the origin of higher mental processes such as problem solving.

Both Piaget and Vygotsky emphasized the importance of social interactions in cognitive development, but Piaget saw a different role for interaction. He believed that interaction encouraged development by creating *disequilibrium*—cognitive conflict—that motivated change. Thus, Piaget believed that the most helpful interactions were those between peers, because peers are on an equal basis and can challenge each other’s thinking. Vygotsky, on the other hand, suggested that children’s cognitive development is fostered by interactions with people who are more capable or advanced in their thinking—people such as parents and teachers (Moshman, 1997; Palincsar, 1998). Of course, children can learn from both adults and peers.

CULTURAL TOOLS AND COGNITIVE DEVELOPMENT. Vygotsky believed that **cultural tools**, including material tools (e.g., printing presses, plows, rulers, abacuses; today, we would add cell phones, computers, the Internet) and psychological tools (signs and symbol systems, e.g., numbers and mathematical systems, Braille and sign language, maps, works of art, codes, and language), play very important roles in cognitive development. All higher-order mental processes, such as reasoning and problem solving, are *mediated* by (accomplished through and with the help

of) psychological tools, such as language and symbols. For example, as long as the culture provides only Roman numerals for representing quantity, certain ways of thinking mathematically—from long division to calculus—are difficult or impossible. But if a number system has a zero, fractions, positive and negative values, and an infinite number of numbers, then much more is possible. The number system is a psychological tool that supports learning and cognitive development—it changes the thinking process. This symbol system is passed from adult to child through formal and informal interactions and teachings (Goswami, 2008).

Thus, children’s knowledge, ideas, attitudes, and values develop through **appropriating** or “taking for themselves” the ways of acting and thinking provided by their culture and by the more capable members of their group (Kozulin & Presseisen, 1995). In this exchange of signs, symbols, and explanations, children begin to develop a “cultural tool kit” to make sense of and learn about their world (Wertsch, 1991). The kit is filled with physical tools such as pencils or rulers directed toward the external world and psychological tools such as concepts or problem-solving strategies for acting mentally. Children do not just receive the tools, however. They transform the tools as they construct their own representations, symbols, patterns, and understandings. In the exchange of signs and symbols such as number systems and language, children create their own understandings (a skunk is a “kitty”). These understandings are gradually changed (a skunk is a skunk) as the children continue to engage in social activities and try to make sense of their world (John-Steiner & Mahn, 1996; Wertsch, 1991). This learning through exchange is most effective in the child’s zone of proximal development, as you will see next.

THE ZONE OF PROXIMAL DEVELOPMENT AND SCAFFOLDING. According to Vygotsky, at any given point in development there are certain problems that a child can solve independently and others the child is on the verge of being able to solve. The child just needs some structure, clues, reminders, help with remembering details or steps, encouragement to keep trying, and so on. Some problems, of course, are beyond the child’s capabilities, even if every step is clearly explained and supported. The **zone of proximal development (ZPD)** is the area between the child’s current development level “as determined by independent problem solving” and the level of development that the child could achieve “through adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

Vygotsky believed that the child is not alone in the world “discovering” the cognitive operations of conservation or classification. Rather, cognitive development occurs through the child’s conversations and interactions with more capable members of the culture—adults or more able peers. These people serve as guides and teachers, providing the information and support necessary for the child to grow intellectually. Jerome Bruner called this adult assistance **scaffolding** (Wood, Bruner, & Ross, 1976). The term aptly suggests that children use this assistance for support while they build a firm understanding that will eventually allow them to solve the problems on their own. Most of this guidance is communicated through language, at least in Western cultures. In some cultures, observing a skilled performance, not talking about it, guides the child’s learning (Rogoff, 1990). To give you a better sense of how scaffolding supports development, see the *Connecting with Children* on the next page suggestions.

Bronfenbrenner: Bioecological Model

Urie Bronfenbrenner (1917–2005) was born in Moscow, Russia, but moved with his family to the United States when he was 6. He completed a double major in psychology and music at Cornell in 1938 and a Ph.D. in psychology from your author Nancy’s alma mater, the University of Michigan, in 1942. Over his long career in psychology, he worked as a clinical psychologist in the U.S. Army and as a professor at Michigan and at Cornell. He also helped to found the Head Start early childhood program.

Bronfenbrenner developed a frame to map the many interacting social contexts that affect development. His model actually served as an organizing frame for our look at the contexts of development in Chapter 1. Bronfenbrenner called his theory a **bioecological model** of development (Bronfenbrenner, 1979; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). The *bio* aspect of the model recognizes that people bring their biological selves to the developmental process. The *ecological* part recognizes that the social contexts in which we develop are ecosystems because they are in constant interaction with and exert influence on each other.

CONNECTING WITH CHILDREN

Guidelines for Teachers and Families:
Scaffolding Children's Learning



Tailor scaffolding to the needs of each child.

Examples

1. Parent, teachers, and coaches, when students are beginning new tasks or topics, provide models, prompts, sentence starters, coaching, and feedback. As the children grow in competence, give less support and more opportunities for independent work.
2. Give children choices about the level of difficulty or degree of independence in reading books or projects; encourage them to challenge themselves but to seek help when they are really stuck.

Make sure children have access to powerful tools that support thinking.

Examples

1. Teach children to use learning and organizational strategies, research tools, language tools (dictionaries or computer searches), day planners, and word-processing programs.

2. Model the use of tools; show children how you use an appointment book or electronic notebook to make plans and manage time, for example.

Teachers, build on the students' cultural funds of knowledge (Moll et al., 1992).

Examples

1. Identify family knowledge by having students interview each other's families about their work and home knowledge (agriculture, economics, manufacturing, household management, medicine and illness, religion, child care, cooking, etc.).
2. Tie assignments to these funds of knowledge, and use community experts to evaluate assignments.
3. Capitalize on dialogue and group learning by experimenting with peer tutoring; teach students how to ask good questions and give helpful explanations.

For more information about Vygotsky and his theories, see: tip.psychology.org/vygotsky.html.

NESTED SYSTEMS. Look at Figure 2.2. Every person lives within a *microsystem*, inside a *mesosystem*, embedded in an *exosystem*, all of which are a part of the *macrosystem* that occurs in time, the *chronosystem*—like a set of Russian painted dolls, one inside the other.

In the microsystem are the person's immediate relationships and activities. For a child it might be immediate family, friends, or teachers, and the activities of play and school. Relationships in the microsystem are reciprocal—they flow in both directions. The child affects the parent, and the parent influences the child, for example. The mesosystem is the set of interactions and relationships among all the elements of the microsystem—the family members interacting with each other or with neighbors, doctors, or teachers, for example. Again, all relationships are reciprocal; the neighbor influences the parents, and the parents affect the neighbor, and these interactions affect the child. The exosystem includes all the social settings that affect the child, even though the child is not a direct member of the systems. Examples are the parents' jobs; the community resources for health, employment, or recreation; or the family's religious affiliation. The macrosystem is the cultural and societal context with their laws, customs, rituals, resources, and cultural tools. All development occurs in and is influenced by the time period—the chronosystem.

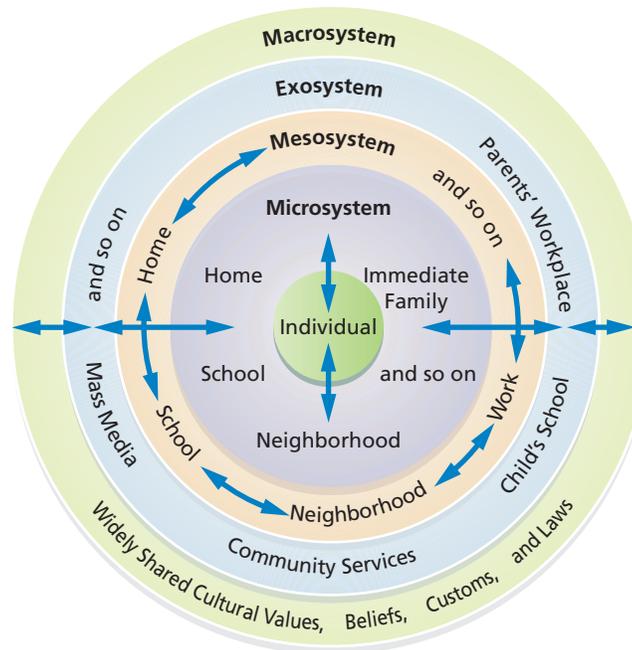
Even though the nested systems approach is a powerful way to look at the influences on the developing child, Jacqueline Goodnow (2011) points out that there are overlaps between the different layers of context. For example, in some cultures the legal system (part of the macrosystem) often defines who counts as family members (in the microsystem). For many parents, the world of family and the world of work overlap extensively. In addition, ethnic minority children may have an earlier and keener awareness of how the culture affects their opportunities and barriers to achievement, so the outer ring of cultural context could be more central for their development and could affect how their families influence their development. Perhaps the model should look more like shifting and overlapping circles of influence instead of nested Russian dolls.

ECOLOGY OF DEVELOPMENT. Bronfenbrenner's theory contains at least two lessons. First, influences in all social systems are reciprocal. Second, many dynamic forces interact in a kind of ecological system for individual development. *Ecology* in this sense refers to the set of interacting

FIGURE 2.2

URIE BRONFENBRENNER'S BIOECOLOGICAL MODEL OF HUMAN DEVELOPMENT

Every person develops within a *microsystem* (family, friends, classmates) inside a *mesosystem* (the interactions among all the microsystem elements), which is embedded in an *exosystem* (social settings that affect the child, even though the child is not a direct member—e.g., community resources, parents' workplace, etc.), all of which are part of the *macrosystem* (the larger society with its laws, customs, values, etc.). Running throughout the whole system is history or time—the *chronosystem* (not pictured but a part of all the other systems).



Note: Arrows across rings indicate reciprocal interactions at all levels.

and coacting contexts in which we all grow and change, from the inner biological structures and processes that influence development such as genes, cells, nutrition, and disease, to the external factors of families, neighborhoods, social relationships, educational and health institutions, public policies, time periods, historical events, and so on. So the effects of a childhood disease on the cognitive development of a child born in the 16th century to a poor family and treated by bloodletting or leeches will be quite different from the effect of the same disease on a child born in 2012 to a wealthy family and given the best treatment available for that time period.

DEVELOPMENTAL SYSTEMS. Urie Bronfenbrenner's bioecological model is an example of the developmental systems perspectives. Developmental systems explanations have four interrelated components. The components are so highly connected that they have been called "fused." The four components are:

1. *The focus of developmental study and understanding has to be change.* Change is possible across the entire lifespan and also across all the interacting contexts that make up the ecology of human development. Change isn't limitless, but it is possible. This means that well-designed interventions to improve children's development are worthwhile and are never "too late." Early experiences are important, but later experiences are powerful too. Children can overcome the effects of negative early experiences but also can lose the advantages of positive beginnings if later experiences are not supportive.

2. *The bases for change are the relations among all systems and levels of human life.* Relations are the units to study—simple explanations that focus on either/or distinctions are not useful. All levels of the individual and all levels of context—from cells to society—develop and change in relation to each other.
3. *All the systems that affect human development are embedded in history*—the most inclusive context of all. We all develop in a particular time, as you saw in our discussion of cohorts in Chapter 1. Because you were born in the late 20th century, for example, you haven't had any experience with bloodletting or leeches as treatments for diseases—unless you traveled to Russia in the late 1990s where, according to an article in the *New York Times*, there is a resurgence of medical uses for leeches, including the treatment of migraines, hypertension, and stomachaches (Banerjee, 2000). This possible use of leeches in other cultures is also related to the last component of the developmental systems approach—the role of diversity.
4. *To understand development, we have to take into account diversity of people, relations, settings, and measurements.* So explanations of how children who speak Chinese come to understand addition in one historical period, using a particular way of assessing knowledge about addition, may not hold for other children in other cultures or time periods or alternative ways of assessing knowledge.

Let's look briefly at another developmental systems theory that emphasizes complex interactions: Thelen's dynamic systems perspective.

Thelen: Dynamic Self-Organizing Systems

The major challenge of developmental science, according to Ester Thelen and Linda Smith (2006), is to understand how new, more complex patterns of thought and behavior emerge: How does something completely novel arise? What is the process? Developmental systems theory (just discussed) and dynamic self-organizing systems theory (described later), though growing from different historical roots, share a focus on how step-by-step processes and multiple interactions at many different levels inside and outside children shape their development (J. P. Spencer, Perone, & Buss, 2011).

We have seen that some researchers point to individual biology (nature) and others to the environment (nurture) to explain the emergence of novel forms. In other words, some scientists, such as Konrad Lorenz, believe that the “instructions” for how to develop are mostly in the genes, whereas others, like B. F. Skinner, emphasize the “instructions” from the environment that guide development. But there is a third possibility, the coaction of nature and nurture, in the form of the individual $\leftarrow \rightarrow$ context relationships we saw in Chapter 1 (Lerner, 2006b). Most developmental psychologists today support this third position.

One type of individual $\leftarrow \rightarrow$ context coaction is called **self-organization**, defined as patterns and orders that “*emerge from the interactions of the components in a complex system without explicit instructions, either in the organism itself or from the environment*” (Thelen & Smith, 2006, p. 259, italics in the original). With self-organization, children change themselves through their own activities. Thelen first proposed dynamic systems theory to understand perceptual motor development in infants and young children. Here is an example of self-organization in motor development. When an infant can hold up her head and look at a toy across the room, has enough strength and coordination in her arms and legs to assume a hands-and-knees crawling position, is on a surface that is not too soft or too uneven, and is motivated, she will crawl across the room to reach the toy. At first the crawling may be unsuccessful or awkward, but she corrects with feedback from senses and muscles to improve. The child has self-organized systems of perception, movement, and thinking to solve a problem (get that toy) with crawling. As she coordinates her actions in the environment, crawling gets faster and smoother, and is stable for several months. But when her balance, strength, and coordination improve, she will walk (or run) across the room to solve the “get me that toy” problem more efficiently.

Avoiding Either/Or

Vygotsky's sociocultural theory, Bronfenbrenner's bioecological model, and Thelen's dynamic systems theory avoid either/or splits and simple explanations. Humans develop in a complex,

TABLE 2.3 • Perspectives on Development

PERSPECTIVE	THEORY	THEORISTS	FOCUS	KEY CONCEPTS
Biological	Ethology/ Evolutionary	Lorenz, Wilson	Evolutionary changes, genetic inheritance, adaptation	Imprinting
	Psychosexual	Freud	Stages of psychosexual development	Id, ego, superego Unconscious motivation
Psychoanalytic Theories	Psychosocial	Erikson	Stages of psychosocial development	Identity Developmental crisis
	Behavioral	Pavlov, Skinner, Watson	Formation of associations, observable behavior change	Classical and operant conditioning stimulus/ response, reinforcement/ punishment
Learning	Social Learning Social Cognitive	Bandura	Role of observations and beliefs in learning and motivation	Enactive and vicarious learning, modeling, self-efficacy
	Information Processing	Anderson/Siegler	How information processing changes over time	Attention; sensory, working, and long-term memory; kinds of knowledge; expertise
Cognitive Stages and Structures	Cognitive Constructivist	Piaget	Stages of cognitive development, structures of knowledge	Sensorimotor, preoperational, operational, and formal thinking, assimilation, accommodation, equilibration
	Sociocultural	Vygotsky	Role of history, culture, and more capable guides in learning and development	Cultural tools, social sources of individual thinking, zone of proximal development, assisted learning, apprenticeships
Contextual/ Dynamic Systems	Bioecological	Bronfenbrenner	Role of interacting and embedded contexts in development	Bioecological model including microsystem, mesosystem, exosystem, macrosystem
	Dynamic Self-Organizing Systems	Thelen	Coaction of nature and nurture, development as a complex system of nested dynamics	Self-organization Individual ← → context relations

connected system of influences. These theories move beyond the either/or thinking of nature versus nurture, continuity versus discontinuity, or critical periods to unify many theories by examining dynamic interactions and coactions. Thelen and Smith (2006) summarize:

What dynamic systems adds to this current landscape is both an emphasis on understanding development as a complex system of nested dynamics, and a complex system of self-organizing interactions at many levels of analysis, including those between the brain and the body and between the body and the world. (p. 307)

In the next chapter, we will delve more deeply into these interactions between the brain, the body, and the world. Table 2.3 compares the five perspectives we have examined in terms of the theory, main theorist, focus, and key concepts.

We have spent many pages discussing theories—the organized explanations of how children develop. The next section asks a very important question: Where do the theories come from? Current theories are not just speculations or opinions; they grow from the careful study of children—something you probably will do in your future as a teacher, medical or child-care worker, parent, or voter. One of our goals in this book is to give you tools for thinking clearly and wisely about your work with children. The basis for that kind of thinking is also the basis for theories: careful research.

✓ **Check your understanding in the Pearson etext**

WHERE DO THE THEORIES COME FROM? RESEARCH METHODS AND DESIGNS

Early theories of child development such as Freud's were not always based on research with children, but rather on logical or philosophical analyses. In the 1800s, Charles Darwin brought a scientist's eye to the process when he described the growth and development of his own son. But theories do more than describe; they explain and predict. Why do young children have a difficult time seeing the world from another person's point of view? How will new perspective-taking abilities unfold? Do boys and girls differ in their abilities to see another person's perspective? Why or why not? What would be the effects on children's relationships with their peers if they learned specific social skills? Questions like these require explanation and prediction, and theories provide the bases.

Theories of child development such as those of Piaget, Vygotsky, Bandura, or Thelen are based on systematic research. These theories are the beginning and ending points of the scientific research cycle. In the beginning, theories provide the research **hypotheses** to be tested or the questions examined. A **hypothesis** is a prediction based on the theory. For example, two different theories might suggest two competing predictions that could be tested. Piaget's theory might suggest that instruction cannot teach preoperational thinkers to use concrete operational thinking, whereas Vygotsky's theory might suggest that teaching could help children learn to use concrete operations. Of course, at times, psychologists don't know enough to make predictions, so they just ask *research questions*. An example question might be, "Is there a difference in Internet usage for male and female adolescents from different ethnic groups?"

Scientific research is a continuing cycle (see Figure 2.3) that involves:

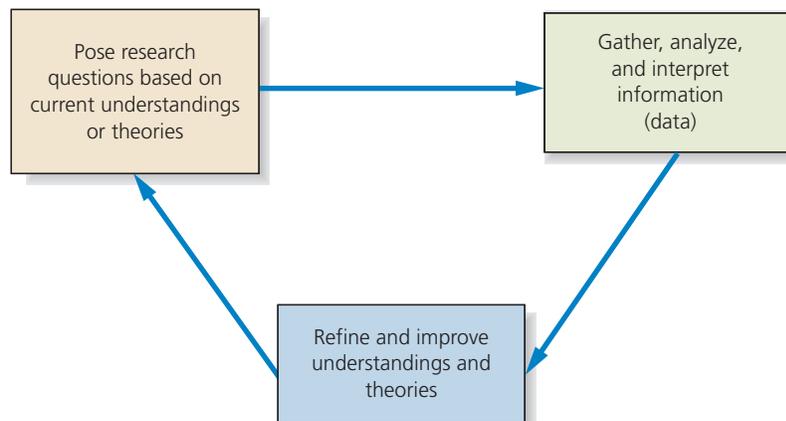
- Clear specification of hypotheses or questions based on current understandings or theories
- Systematic gathering and analyzing of all kinds of information (data) about the questions from well-chosen research participants
- Modifying and improving explanatory theories based on the results of those analyses
- Asking new, better questions based on the improved theories . . . and on and on

This empirical process of collecting data to test and improve theories is repeated over and over, as you can see in Figure 2.3. **Empirical** means *based on data*. When scientists say that

FIGURE 2.3

A RESEARCH CYCLE

Research begins with questions based on current understanding, followed by gathering, analyzing, and interpreting information to answer the questions. Using these findings, the current theories are refined and become the basis for new research questions.



identifying an effective antibiotic or choosing a successful way to teach reading is an “empirical question,” they mean that you need data and evidence to make the call. Basing decisions on empirical analyses protects scientists from developing theories based on personal biases, rumors, fears, faulty information, or preferences (Mertler & Charles, 2005). Answering questions with carefully gathered data means that science is self-correcting. If predictions do not play out or when answers to carefully asked questions do not support current best understandings (theories), the theories have to be changed. You can use the same kind of systematic and self-correcting thinking in your work with children.

In this section we look at the research methods that have been used to test hypotheses and examine questions about children. The major issues in such research are whom to study, how to study, and how to protect the rights of children in the process. So the first question is. . .

Whom to Study? Samples and Participants

If we want to understand and explain the development of children or adolescents, whom do we study? The obvious answer is children or adolescents, but which ones? That depends on which children we want to make claims and predictions about. In other words, to whom do we want to *apply* the findings? This is a question about **generalizing** the results of the research to the appropriate children. A good start is to specify more clearly the age or grade, gender, socioeconomic status (SES) level, race, language group, ethnicity, and so on of the target **population**—all the children we are interested in knowing about. For example, are we interested in children who attend day care centers, or children of single parents, or children who have younger siblings? Then we need to include those kinds of children in the research because they are the *target population*—the ones we are interested in. Let’s assume researchers are interested in 3- to 4-year-old boys and girls who attend all-day preschools. Because they can’t possibly study every child in that situation, they have to look at a **sample**—a smaller group that represents the whole population of children in all-day preschools. How do researchers find a representative sample? Table 2.4 summarizes several ways to identify participants through sampling.

Research Designs: How to Study

A research design is an overall plan for the entire study. We will look at four basic designs—correlational, experimental, case studies, and ethnographies.

TABLE 2.4 • Types of Sampling Procedures

TYPE OF SAMPLING	DEFINITION	ADVANTAGES	PROBLEMS
Random Sample	Selecting purely by chance; each participant has an equal chance of being selected—like names out of a hat	Best way to get an accurate representation	Difficult to reach everyone; may be hard to gain cooperation and participation
Convenience Sample	Selecting participants based on who is available, such as in a local preschool	Researcher has better access; research may be less costly	Not as likely to represent the population of interest
National Database Sample	Using responses from participants already available in a large database such as the NICHD Early Child Care Research Network	Very economical; large numbers of participants, often carefully identified to be representative	The data available may not be exactly what you need; you have to “make do” with what is already there
Cluster Sampling	Sampling natural clusters such as classes or neighborhoods	Like convenience sampling, may cost less; also the unit of interest may be the group	Not as likely to represent the population of interest
Stratified Sampling	Random sampling from subgroups of interest (e.g., males and females with high, middle, and low achievement scores in reading) to better represent the population	The stratified sample is weighted like the population of interest—no subgroup is over- or underrepresented	Like random sampling, may be difficult to reach everyone; may be hard to gain cooperation and participation

CORRELATIONAL STUDIES. Some research in child development is descriptive; that is, the purpose is simply to describe children, situations, relationships, and so on. Often the results of descriptive studies include reports of *correlations*. We will take a minute to examine this concept, because you will encounter many correlations in the coming chapters.

A **correlation** is a number that indicates both the strength and the direction of a relationship between two events or measurements. Correlations range from 1.00 to -1.00 . The closer the correlation is to either 1.00 or -1.00 , the stronger the relationship. For example, the correlation between height and weight is about .70 (a strong relationship); the correlation between height and number of languages spoken probably is about .00 (no linear relationship at all).

The sign of the correlation tells the direction of the relationship. A **positive correlation** indicates that the two factors increase or decrease together. As one gets larger, so does the other. Height and weight are positively correlated because greater height tends to be associated with greater weight. A **negative correlation** means that increases in one factor are related to decreases in the other. For example, the correlation between the gas mileage of a car and your monthly gas cost is negative—the lower the mileage, the higher the cost. Some correlations are not linear but **curvilinear**—the relationship changes at different points. For example, age and running speed would not appear to be correlated until you observed that people tend to run faster as they get older from toddlerhood to early adulthood, but then slower as they age—an upside down U-shaped curve.

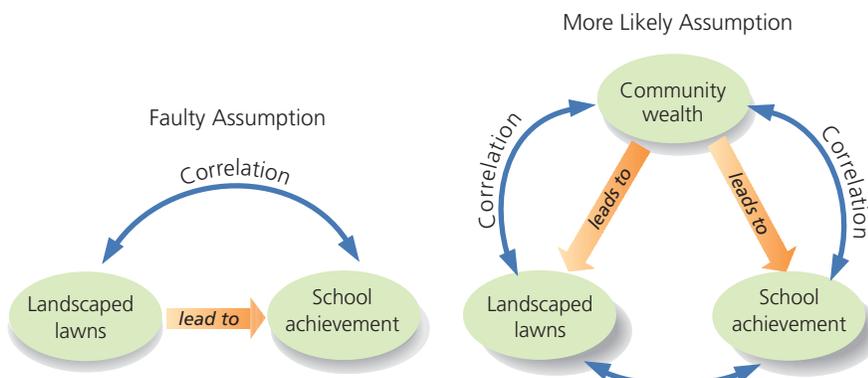
It is important to note that correlations do not prove cause and effect, just co-occurrence (see Figure 2.4). Many people, especially politicians and others trying to make a point, mistakenly assume that correlation means causation. But if that were the case, looking at Figure 2.4, the way to raise test scores for failing schools would be to hire a lawn service for the neighborhoods around the schools—probably not a good plan.

With correlational studies, researchers can examine the relationships between variables such as hours of TV viewing and obesity in children or time spent in day care and aggressive play. Correlational studies can show that two things are related, but remember, they cannot say what is causing what. For example, amount of TV viewing is positively correlated with obesity, but does TV viewing cause obesity or does being obese cause children to watch more TV because they don't enjoy playing outside? Does being in day care teach children to be more aggressive, or do parents leave their aggressive children in day care longer to get some peace at home? We can't tell based on correlations alone because—one more time—*correlation is not causation*. Keep this in mind in your observations of children.

FIGURE 2.4

CORRELATIONS AND CAUSATION

Correlations do not show causation. When research shows that landscaped lawns and school achievement are correlated, it does not show causation. Community wealth, a third variable, may be the cause of both school achievement and landscaped lawns.



EXPERIMENTAL STUDIES. A second type of research—**experimentation**—allows researchers to go beyond predictions to actually study causes and effects. Instead of just observing and describing an existing situation, the investigators introduce changes in some variables and note the effects on other variables. **Variables** are anything that can change or vary. The variables that are altered or manipulated are called **independent variables**, and the resulting effects are noted in the **dependent variables**. The question in experimentation is, “Do changes in the independent variable (e.g., participation in a drug prevention program) cause changes in the dependent variable (decreased drug use for 14-year-olds)?” For example, Bethany Rittle-Johnson and Alexander Kmicikewycz (2008) conducted an experiment to determine whether studying arithmetic problems by figuring out the answers yourself led to higher test scores than studying the same problems using calculators to get the answers. Third graders in two different schools were randomly assigned to one of the study methods, then tested 2 days later and tested again 2 weeks after that. What do you suppose happened? The researchers found no significant differences in the average test scores of the “generate your own answer” group compared to the “use a calculator” group, but that is not the most interesting part. When the researchers considered the students’ pretest scores, they found that students who began the experiment with less knowledge of arithmetic actually learned significantly more in the “generate your own answer” condition. So the effects of treatments are not always straightforward or simple.

In correlational and experimental research, statistical tests are used to analyze the data. When the relationship between two variables (correlation) or the difference between treatment groups (experiment) are described as **statistically significant**, it means that the relationship or the difference probably did not happen simply by chance. In studies you will see a notation indicating $p < .05$ or $p < .01$. This means statistical analyses indicate that the observed findings would happen by chance only 5 out of 100 times ($p < .05$) or 1 out of 100 times ($p < .01$). In other words, something besides chance or luck is probably operating in the situation. In the preceding example, students with *less* knowledge learned significantly more when they studied by figuring out the problems themselves. In contrast, students with *more* prior knowledge did better on the tests if they had studied with calculators, but this difference was *not statistically significant*, so this finding could have happened by chance.

CLINICAL INTERVIEWS AND CASE STUDIES. Jean Piaget pioneered an approach called the **clinical interview** to understand children’s thinking. The clinical interview uses open-ended questioning to probe responses and to follow up on answers. Questions go wherever the child’s responses lead. Here is an example of a clinical interview with a 7-year-old. Piaget is trying to understand the child’s thinking about lies and truth, so he asks, “What is a lie?”

“What is a lie?—*What isn’t true. What they say that they haven’t done.*—Guess how old I am.—*Twenty.* No, I’m thirty.—Was that a lie you told me?—*I didn’t do it on purpose.*—I know. But is it a lie all the same, or not?—*Yes, it is the same, because I didn’t say how old you were.*—Is it a lie?—*Yes, because I didn’t speak the truth.*—Ought you be punished?—*No.*—Was it naughty or not naughty?—*Not so naughty.*—Why?—*Because I spoke the truth afterwards!*” (Piaget, 1965, p. 144)

Researchers also may employ case studies. A **case study** investigates one person or situation in depth. For example, Benjamin Bloom and his colleagues conducted in-depth studies of highly accomplished concert pianists, sculptors, Olympic swimmers, tennis players, mathematicians, and neurologists to try to understand what factors supported the development of outstanding talent. The researchers interviewed family members, teachers, friends, and coaches to build an extensive case study of each of these highly accomplished individuals (B. S. Bloom et al., 1985). Some educators recommend case study methods to identify students for gifted programs because the information gathered is richer than just test scores.

ETHNOGRAPHY. One descriptive approach, ethnography, is borrowed from anthropology. **Ethnographic methods** involve studying the naturally occurring events in the life of a group and trying to understand the meaning of these events to the people involved. In child development

research, ethnographies might study how families, communities, or schools are organized to provide care for children and the effects of these organizational structures on the children. In some studies the researcher uses *participant observation*, actually participating in the group, to understand the actions from the perspectives of the people in the situation. Teachers can do their own informal ethnographies to understand life in their classrooms.

QUANTITATIVE VERSUS QUALITATIVE RESEARCH. There is a distinction that you will encounter in your journey through child development—the contrast between quantitative and qualitative research. These are large categories and, like many categories, a bit fuzzy at the edges, but here are some simplified differences.

Quantitative research uses numbers, measurement, and statistics to assess levels or sizes of relationships among variables or differences between groups. Both correlational and experimental types of research generally are quantitative because measurements are taken and computations are made. Quantitative researchers try to be as objective as possible and remove their own biases from their results. One advantage of good quantitative research is that results from one study can be generalized or applied to other similar situations or people.

Qualitative research, on the other hand, uses words, dialogue, events, and images as data. Interviews and observations are key procedures. Case studies and ethnographies are examples of qualitative research. The goal is not to discover general principles, but rather to explore specific situations or people in depth and to understand the meaning of the events to the people involved in order to tell their story. Qualitative researchers assume that no process of understanding meaning can be completely objective. In fact, they are more interested in interpreting subjective, personal, or socially constructed meanings.

BEWARE OF EITHER/OR. *Qualitative* research tells us what specifically happened in one or a few situations. Conclusions can be applied deeply, but only to what was studied. *Quantitative* research can tell us what generally happens under certain conditions. Conclusions can be applied more broadly. Today many researchers are using mixed methods or complementary methods—both qualitative and quantitative—to study questions both broadly and deeply. In the final analysis, the methods used—quantitative, qualitative, or a mixture of both—should fit the questions asked.

TEACHERS AS RESEARCHERS. Research also can be a way to improve teaching in one classroom or one school. The same kind of careful observation, intervention, data gathering, and analysis that occurs in large research projects can be applied in any classroom to answer questions such as, “Which writing prompts seem to encourage the best descriptive writing in my class?” “When does Kenyon seem to have the greatest difficulty concentrating on academic tasks?” “Would assigning task roles in science project groups lead to more equitable participation of girls and boys in the work?” This kind of problem-solving investigation is called **action research**. By focusing on a specific problem and making careful observations, teachers can learn a great deal about both their teaching and their students.

How to Gather Information

Once you have a research design, you must decide what kind of information you need and how to get it. The researcher’s tool kit is filled with different information-gathering methods. We will look at four basic tools in the researcher’s methods kit: watching, asking, testing, and measuring. These same tools can help you as you think systematically about your work with children and adolescents or collect data for action research.

WATCHING: OBSERVATIONS. One way to gather information is to observe children and make careful notes. These observations could use running records (writing down everything that happens), checklists or structured observation guides, frequency counts or time records of certain behaviors, or any other way of systematically describing the observations. These days, the children might be recorded using video or audio technology to allow very careful, moment-by-moment observations. Children might be observed in naturally occurring situations such as restaurants, classrooms, grocery stores, or playgrounds as they interact with toys, school tasks, friends, strangers,

teachers, or family members. When children are observed in their own real-life settings, the process is called **naturalistic observation**.

But what if researchers are interested in how children respond to a certain situation, such as seeing another child behave aggressively? If the researchers wait for every child in a preschool class to have such an experience, they may be in that class a long time. An alternative is to structure the situation so that children have the experiences that the researchers want them to have. This is called **laboratory observation**, or **structured observation**. In this case, the researchers might show each child a video of a child punching or kicking a “Bobo doll” (a child-sized inflated toy), then see how the child responds to the same toy in real life, as Albert Bandura did (1965).

ASKING: SELF-REPORTS, SURVEYS, AND INTERVIEWS. By now you probably have completed a number of surveys, questionnaires, or interviews, so you know what this process is like. Questions for children have to be carefully designed so the children understand what is being asked and can respond in appropriate ways for their age and ability. There are many ways to gather self-report information. Older children and adults can keep diaries or journals. They can respond to *structured questions* (the same for everyone) or *open-ended questions* (following wherever the questions and answers lead). Older children and adults can take online surveys or complete printed mailed questionnaires.

One procedure often used to study infant development, called **habituation**, measures changes in the infant’s responses to different stimulation. We can’t ask babies to fill out questionnaires, but we can study changes in their breathing rate, direction of eye gaze, or length of time they look at something, as you will see in Chapter 4.

TESTS AND PERFORMANCES. Sometimes the best way to gather information about children’s development is to test their abilities, ask them to perform an activity, solve a problem, read, write, draw, run, jump, resist the temptation of eating a piece of candy now with the promise of more candy later, or perform other tasks. For example, a common way of assessing cognitive development is to ask students to explain the meaning of words. The questions might move from simple and concrete words such as *apple* or *book*, to complex and abstract concepts such as *anthropomorphic* or *egotistical*. Today, in many countries, children undergo extensive testing, as you probably know well from your own experiences. We will explore the different kinds of cognitive tests—intelligence tests, standardized achievement tests, and diagnostic tests—in upcoming chapters of this text.

PSYCHOPHYSIOLOGICAL MEASURES. Today advances in technology have resulted in many ways to measure the biological processes that accompany different aspects of development. If researchers are interested in studying anxiety or fear in children, instead of just asking children how anxious they feel, the researchers might use measures of heart rate, blood pressure, dilation of the eyes, or stress hormone levels. Brain imaging techniques such as **functional magnetic resonance imaging (fMRI)** show how blood flows within the brain when children or adults do different cognitive tasks. In another technology, **positron emission tomography (PET)** scans can track brain activity under different conditions, as shown in Figure 2.5 on the next page.

Even though these innovative technologies have created exciting possibilities for exploring connections between biological and neurological processes and behavior, there are limitations to these ways of gathering information. The equipment is very expensive, and interpreting results takes expert knowledge. Children may find the process frightening or very tiring. Their reactions may not reflect real-life responses. In many of the upcoming chapters, we will examine the uses of psychophysiological measures to gather data about child development.

Research requires good information, but gathering good information is not the end of the process. The information must be analyzed and interpreted in relation to the original research hypotheses or questions.

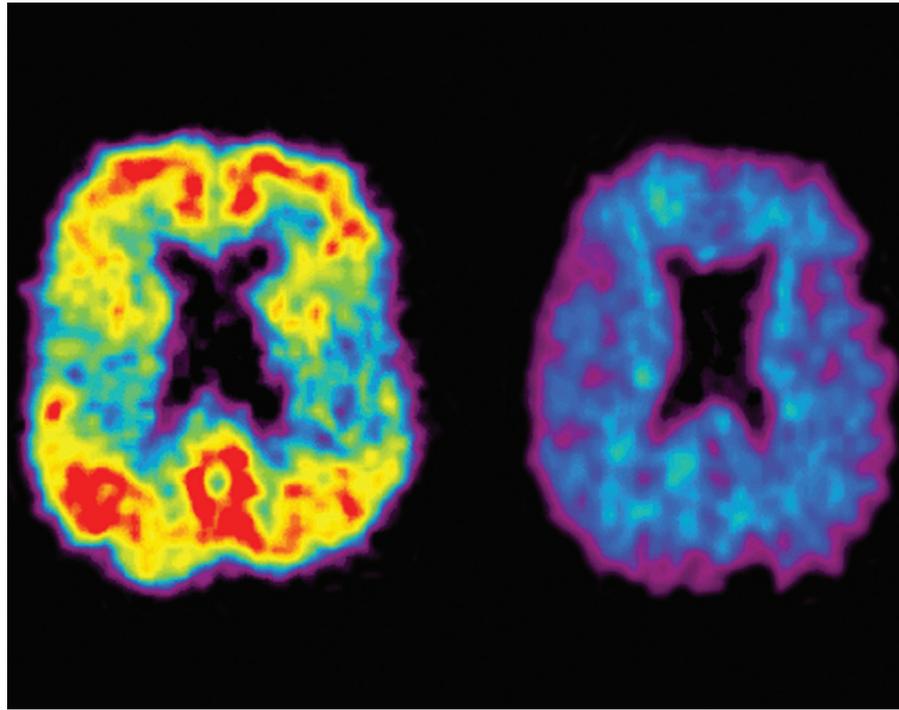
The Role of Time in Research

Another distinction is useful in understanding research—a distinction based on time. Many things that child development researchers want to study happen over several months or years. Time is a factor in longitudinal, cross-sectional, sequential, and microgenetic study designs.

FIGURE 2.5

A POSITRON EMISSION TOMOGRAPHY SCAN

These positron emission tomography scans from the Alzheimer's Association Web site compare the brain of a person with Alzheimer's disease and a healthy brain. A special procedure using a radio-tracer highlights deposits of beta-amyloid in the brain. The level of amyloid in the brain (shown in red) is one indicator of Alzheimer's disease.

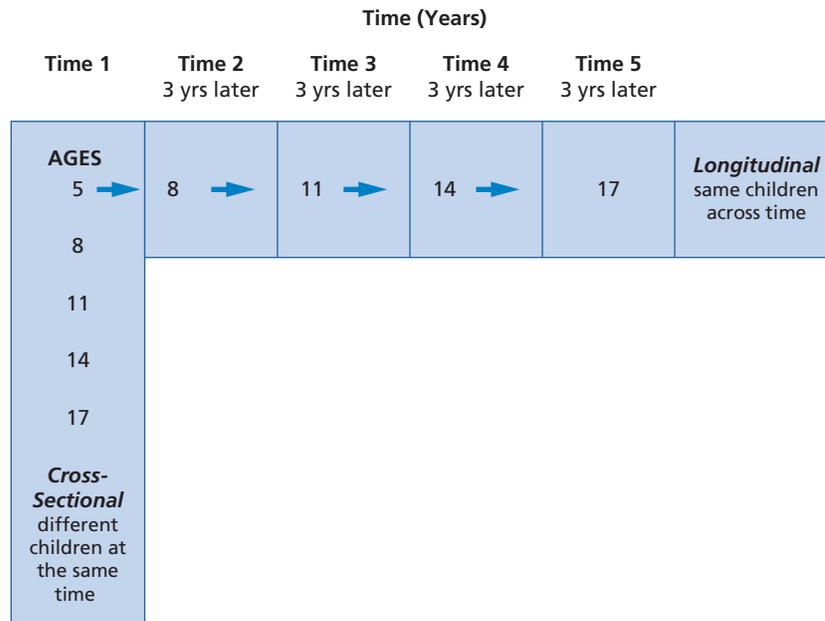


LONGITUDINAL AND CROSS-SECTIONAL STUDIES. Ideally, researchers would study development by observing the same children over many years as changes occur. These are called **longitudinal studies** (see Figure 2.6). For example, the NICHD (National Institute of Child Health and Human Development) Early Child Care Research Network (2005c) examined the connections between parenting and children's attention, memory, and planning skill development, while taking into account the effects of family income, mother's intelligence, and child's gender and ethnicity. They followed more than 700 children from age 6 months to first grade. You will read about the results of this impressive longitudinal study in Chapter 6. We read in the newspaper a few years ago about plans for a massive study that will follow 100,000 children in 105 countries from before they are born to age 21 to learn about how environment, genes, and other factors affect children's health (Belluck, 2010). Longitudinal studies can be informative, but they are time-consuming, expensive (the prenatal to age 21 study is expected to cost almost \$7 billion), and not always practical. Keeping up with subjects over the years as they grow up and move can be impossible. As some participants drop out, disappear, or even die, the composition and nature of the group changes. Are the people who survive and stay in touch with the researcher different from those who drop out? Maybe.

Because longitudinal study is difficult and results take so long, much research in child development is **cross-sectional**, comparing groups of children at different ages. For example, to study how boys' and girls' self-concepts change from ages 5 to 17, researchers can interview children of several different ages, rather than following the same children for 12 years (see Figure 2.6). But there are

FIGURE 2.6

CROSS-SECTIONAL AND LONGITUDINAL RESEARCH DESIGNS



disadvantages with cross-sectional designs. What if we compare the cognitive abilities of groups of children and adults ages 8, 12, 16, 20, 30, and 40? Some of the differences might be due to variations in nutrition or schooling for the different groups. The participants would be members of different historical cohorts (discussed in Chapter 1), so many of their life experiences would be different. For example, the 40-year-olds did not grow up with the same technology or even the same course requirements in high school as the others. Also, discovering differences between 8-year-olds and 40-year-olds does not reveal when or how the differences developed, just that the differences exist.

SEQUENTIAL STUDIES. One final design combines longitudinal and cross-sectional research by studying different age groups and then following those groups as they develop across time. So researchers might start with two groups (ages 2 and 6), then retest those groups every 2 years (at ages 4 and 8, then 6 and 10, then 8 and 12, then 10 and 14). Or the researchers might even add a new group every 2 years, and then keep following them too. These are called **sequential designs**.

MICROGENETIC STUDIES. The previous designs examine change over long periods of time. The goal of microgenetic research is to intensively study cognitive processes in the midst of change—as the change is actually happening. For example, researchers might analyze how children learn a particular strategy for adding two-digit numbers over the course of several weeks. The **microgenetic approach** has three basic characteristics: (a) researchers observe the entire period of the change—from when it starts to the time it is relatively stable; (b) many observations are made, often using videotape recordings, interviews, and transcriptions of the exact words of the individuals being studied; and (c) the behavior that is observed is “put under a microscope”—that is, examined moment by moment or trial by trial. The goal is to explain the underlying mechanisms of change—for example, what new knowledge or skills are developing to allow change to take place (Siegler & Crowley, 1991). This kind of research is expensive and time-consuming, so often only one or a few children are studied.

✓ **Check your understanding in the Pearson etext**

ISSUES IN CHILD DEVELOPMENT RESEARCH

Here we examine three critical and interesting issues in research on child development. The first involves the ethical conduct of research with children (see the *Policy and Child Well-Being* box). The second looks at the tension between basic and applied research as well as the emerging interest in community-based research. Finally, we explore the need to be a critical consumer of research in child development.

Policy and Child Well-Being: Ethics in Research with Children

The goal of research in child development is to *understand* the what, why, and how of development and also to use this increased knowledge to *improve* the well-being of children and families. But research must be carefully designed and conducted so that the first goal of understanding is not reached at the expense of the second goal of improving the lives of the participants in the research. In other words, researchers must be careful to protect the children and families in their studies.

Not that long ago, scientists decided on their own if their research met ethical standards. But this system was far from perfect. Remember Little Albert, who was taught to be terrified of fur without even informing his mother about the

procedures or ever undoing the learning? Another example is the 15-year study at the Willowbrook State School in Staten Island, New York, that included intentionally infecting developmentally challenged children with hepatitis to test treatments for the disease (M. R. Moon & Khin-Maung-Gyi, 2009).

Today, special groups called **institutional review boards (IRBs)** evaluate every study involving human subjects conducted at universities and other research institutions such as hospitals or mental health agencies. The IRB reviews are based on guidelines established by the American Psychological Association (APA) and the SRCD. Table 2.5 summarizes the main ethical considerations from these two organizations.

TABLE 2.5 • Ethical Considerations in Research with Children

Protecting Children from Harm	Researchers should use no procedures that might harm the child physically or psychologically. When in doubt, consult with institutional review boards. If harm is possible, the researcher must find other ways to conduct the research. In all cases, the expected benefit must outweigh any potential harm to the participants.
Informed Consent	Research participants must give their informed consent to be a part of any study. Informed consent means that people have the right to an explanation about every part of a study that could affect their willingness to participate. Also, research participants must be able to withdraw consent and drop out of a study at any time they choose. Parents or guardians must give informed, preferably written, consent for children under 18. Other people involved in the study, such as teachers or therapists, have to give their consent too.
Incentives and Pressures	Incentives to participate in research must be consistent with what the children could expect in their own lives, so the incentives do not become pressures.
Confidentiality and Privacy	All information about individual participants is confidential. Names and other identifying information cannot be connected to the data. The information must be protected to prevent other people who are not involved in the research from getting access to the data.
Informing Participants	All research participants, including children, have the right to learn about the results of the study in language that they can understand. If deception was involved, the researcher must explain what was done and why.
Cultural Sensitivity	The American Psychological Association asserts, “psychologists are aware of and respect cultural, individual, and role differences, including those based on age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation, disability, language, and socioeconomic status and consider these factors when working with members of such groups. Psychologists try to eliminate the effect on their work of biases based on those factors, and they do not knowingly participate in or condone activities of others based upon such prejudices.” (apa.org/ethics/code2002.html)

Source: Based on the Ethical Standards for the Society for Research in Child Development (srcd.org/ethicalstandards.html) and from the Code of Ethics for the American Psychological Association (apa.org/ethics/code2002.html).

PROTECTING CHILDREN FROM HARM. All research with human subjects and animals must be conducted ethically, but ethical considerations in research on children are especially important and complicated. Consider these situations:

- Middle school students are asked to list the names of the class members they would most and least like to work with on a project.
- Children are given a puzzle that can't be solved, but are told that other children have solved it, to study reactions to failure.

One of the first standards that must be met by all research is that the *expected benefit must outweigh any potential harm* to the participants. Ideally, completing the research study will directly benefit each participant, but at the very least, the likely benefit to children in general must outweigh the possible harm to individuals in the study. Are these conditions met in these situations? You really don't have enough information to make this call, but just a quick analysis points to possible problems. In the first situation, rejected children might be even more rejected after they are identified as unwanted project partners by several of their peers. In the second situation, children could be frustrated, feel incompetent, or become distrustful of adults who misled them about the puzzles.

INFORMED CONSENT. Today all research participants must give their informed consent to be a part of any study. But children may not have the cognitive capability to understand the goals or procedures explained to them. So an adult—usually the parent or guardian—must give informed consent for children under 18 years old (remember the consent form at the beginning of this chapter). But what if children are abused or a parent does not have the child's best interests at heart? Determining who is allowed to give consent is an issue that IRBs evaluate.

INCENTIVES AND PRESSURES. Often children or parents are offered an incentive or “thank you gift” for participating in the research. Ethical guidelines require that these incentives be consistent with what the children could expect in their own lives, so the incentives do not become pressures. And keep in mind that concerned parents whose children have medical or psychological problems may feel pressed to consent to research participation just to have their child spend some time with a child development professional.

CONFIDENTIALITY. All information about individual participants is confidential. Names and other identifying information cannot be connected to the data. To protect the identity of participants, researchers often assign codes or pseudonyms in case studies. The only exception to not sharing any information with others is when researchers discover that a child may be in danger—in an abusive home or considering suicide, for example. Then there is a responsibility to act in the best interests of the child.

INFORMING PARTICIPANTS. All research participants, including children, have the right to learn about the results of the study in language that they can understand. If deception was involved, the researcher must **debrief** the participants, that is, explain what was done and why. But children may have a hard time understanding why the adult “lied” to them, so deception with children is discouraged unless there is no other way to gather the necessary information.

Think for a moment—how will you protect the rights of children? How will these safeguards apply to your practice?

Basic, Applied, and Community-Based Developmental Research

There were times in the history of child development when basic and applied research—the need for pure scientific knowledge versus the need for knowledge to guide public policy—were at odds. After World War II, the status of science around the world increased, and the U.S. government set aside quite a bit of money for basic research in science. Cause-and-effect research and theory building were the most admired goals. “Practical” applied research was not as highly prized; those who did mostly practical work on university faculties were lower in status than their scientific colleagues (Groark & McCall, 2005).



The graduate student in this video conducted action research in his classroom. As you listen to his comments about ethical issues, consider his concern for informing participants and protecting their confidentiality.

But by the mid-1960s, the need for useful knowledge to guide public policy challenged earlier preferences for pure science. In 1969, George Miller gave his presidential address to the APA and encouraged the APA members to “give psychology away” to policy makers, the public, and practitioners. Since that time, interest in and research funding for applied and policy-related research have grown. Today, there is a strong push from the U.S. government for *evidence-based social programs* in all areas—mental health, medicine, and education.

But not all psychologists or practitioners believe that the push for evidence-based programs is valuable, as you can see in the *Point/Counterpoint*.

POINT/COUNTERPOINT

What Kind of Research Should Guide Social Policy?

Since at least the 1980s, debates have raged about the best kind of research to use in formulating policies for children, particularly in education. Should we rely only on scientific experiments, or is that kind of work impossible in education? What are the arguments?

POINT

SOCIAL POLICY SHOULD BE GUIDED BY SCIENTIFIC EXPERIMENTS—EVIDENCE-BASED RESEARCH

According to Grover Whitehurst, the director of the U.S. Office of Educational Research and Improvement, the best research to guide educational practice is randomized experiments. Robert Slavin (2002) paints a bright future for educational reform guided by scientifically based research:

This process could create the kind of progressive, systematic improvement over time that has characterized successful parts of our economy and society throughout the 20th century, in fields such as medicine, agriculture, transportation, and technology. In each of these fields, processes of development, rigorous evaluation, and dissemination have produced a pace of innovation and improvement that is unprecedented in history. . . . Educational practice does change over time, but the change process more resembles the pendulum swings of taste characteristic of art or fashion (think hemlines) rather than the progressive improvements characteristic of science and technology. (p. 16)

The major reason for extraordinary advances in medicine and agriculture, according to Slavin, is that these fields base their practices on scientific evidence. Randomized clinical trials and replicated experiments are the sources of the evidence. The emphasis on evidence is not limited to education. Robert McCall and his colleagues note that “funders and policy makers at the national and local levels are insisting that new programs desiring funding must be essentially replications of service

programs that research has already demonstrated to be effective” (McCall et al., 2004, p. 331).

COUNTERPOINT

EXPERIMENTS ARE NOT THE ONLY OR EVEN THE BEST SOURCE OF EVIDENCE

David Olson (2004) disagrees strongly with Slavin’s position. He claims that we cannot use medicine as an analogy to education. “Treatments” in education are much more complex and unpredictable than administering one drug or another in medicine. In addition, every educational program is changed by classroom conditions and the way it is implemented. David Berliner (2002) makes a similar point:

Doing science and implementing scientific findings are so difficult in education because humans in schools are embedded in complex and changing networks of social interaction. The participants in those networks have variable power to affect each other from day to day, and the ordinary events of life (a sick child, a messy divorce, a passionate love affair, migraine headaches, hot flashes, a birthday party, alcohol abuse, a new principal, a new child in the classroom, rain that keeps the children from a recess outside the school building) all affect doing science in school settings by limiting the generalizability of educational research findings.

BEWARE OF EITHER/OR

Berliner concludes that a complex problem like education needs a whole range of methods for study.

Ethnographic research is crucial, as are case studies, survey research, time series, design experiments, action research, and other means to collect reliable evidence for engaging in unfettered argument about education issues. A single method is not what the government should be promoting for educational researchers. (Berliner, 2002, p. 20)

Researchers in child development are comfortable using a range of methods, as you saw earlier in this chapter. Rather than debate about which methods are the best, Robert McCall and his colleagues (2004) argue that child development researchers should take advantage of the press for evidence-based social programs by working with practitioners and policy makers to design better research. One kind of partnership with practitioners is community-based research.

Community-Based Research

Community-based research is conducted by, with, and for communities. The goal is to develop and improve services for a specific community group, in contrast to pursuing scientific and academic communities' intellectual interests (Scolove, Scammell, & Holland, 1998). One example of community-based research is the Early Childhood Initiative in Pittsburgh. In 1994, the Heinz Endowments pulled together funding from other foundations, businesses, and social agencies to support several urban neighborhoods as they designed and expanded quality early childhood programs for children in poverty. Then in 1996, an interdisciplinary team began a longitudinal study of the different initiatives, applying authentic assessment procedures that:

- Used a collaborative research model with community partners for all phases of the research from beginning to end.
- Asked whether the program works in a natural setting rather than a laboratory setting.
- Applied the developmentally appropriate quality guidelines of the National Association for the Education of Young Children, the Division for Early Childhood, Council for Exceptional Children, and the Head Start Performance Standards (see Chapter 6).
- Relied on ongoing observations from consistent caregivers in the child's life.
- Offered ongoing feedback to teachers, parents, and the community about children's learning and needed program refinements.
- Operationalized a longitudinal repeated-measures design using sophisticated statistical techniques that could identify effects at different levels—teacher and school.

The results of the evaluations showed that the 1,350 students enrolled between 1997 and 2003 did learn the early skills needed for school success and their parents learned new ways of supporting their children's development (Bagnato, Grom, & Haynes, 2003).

Thinking Critically about Research

No matter what approach you use to research and no matter where you encounter claims and findings from studies, you have to be a critical consumer. Let's look first at some of the classic criteria for research, and then consider the special challenges presented today by the sea of information available through the media and technology.

RELIABILITY AND VALIDITY. We have talked quite a bit about evidence-based research. But the evidence from research is only as trustworthy as the information it is based on. No matter how the information was gathered—through observations, self-reports, surveys, tests, ethnographies, or physiological measures—the procedures used must be reliable and valid.

Reliability is the repeatability or stability of a measure: Would you get the same results if you used the procedure again? For example, a reliable scale gives you the same reading every time, as long as your weight stays the same. Quantitative researchers can calculate different statistics to assess measurement reliability. Qualitative researchers also have procedures for ensuring the dependability of their data. One way is called **triangulation**, or seeking multiple perspectives, for example, by gathering data from multiple sources (observations, interviews, diaries, letters, etc.) or using multiple investigators to make interpretations and compare observations.

Validity is accuracy—assurance that the procedure measures what it was intended to measure. A reliable scale could give you the same reading every time, but still weigh you above or below your true weight—so reliability does not guarantee validity. A more precise definition of validity is

that the judgments and decisions based on the procedures are appropriate and sound (R. L. Linn & Gronlund, 2000; Popham, 2005). Quantitative researchers have statistical ways to determine evidence of validity. Qualitative researchers also are interested in appropriate and sound judgments, but they are more likely to talk about the *trustworthiness* of the interpretations from the research.

GENERALIZATION AND APPLICATION. Another way to look at validity is to ask if the findings of the study will generalize to (apply to) people outside the participants in the study. If we set out to learn about the social development of 4-year-olds in all-day preschool, did we choose the sample, research methods, designs, and analyses well? Did we accomplish the study as planned without losing too many participants along the way? Will what we learned apply to other 4-year-olds in all-day preschool? This has been called **external validity**: Are the findings valid outside the original group studied? One threat to external validity occurs when the setting or situation of the research is so different from the participants' real lives that, in Urie Bronfenbrenner's (1979) words, the study just tells us about "the strange behavior of children in strange situations with strange adults" (p. 19). When the research situation is so "strange" compared to the child's usual world that generalization outside the study is unwarranted, we say that the study lacks **ecological validity**.

ABSENCE OF BIAS IN ASSESSMENT. Reliability and validity have long been criteria for judging assessments and research methods. But over the past 20 years, psychologists realized that another criterion should be added: absence of bias. **Assessment bias** "refers to qualities of an assessment instrument that offend or unfairly penalize a group of students because of the students' gender, ethnicity, socioeconomic status, religion, or other such group-defining characteristic" (Popham, 2005, p. 77). Biases are aspects of the test such as content, language, or examples that might distort the performance of a group—either for better or for worse. For example, if a reading test used passages that described boxing or football scenarios, we might expect—on average—males to do better than females.

OTHER SOURCES OF BIAS. Besides possible biases in assessments or measurements, many other possible sources of bias occur in research. Selection bias may occur when only volunteers are used in a study or when only a small percentage of people return surveys. Perhaps only the most motivated, or the most dissatisfied, or the most enthusiastic complete the study, or maybe those who drop out of a study may differ in systematic ways from those who complete. The people conducting the research may have expectations about what should happen and somehow communicate those expectations to participants. Perhaps participants say or do what they think the researchers want, or maybe they do not trust the researchers enough to be honest. The mere process of being observed, interviewed, or assessed may change the way participants act or respond. And researchers may "listen" for what they expect to hear. If a company or agency sponsors the research, their opinions could influence how the study is designed or how the results are interpreted. Finally, depending on the beliefs and values of the researchers, some results could be emphasized and others downplayed.

Researchers can counter these biases in many ways. Research published in scholarly journals is carefully scrutinized for obvious biases, but just the same, it makes sense to be aware that some biases are probably part of the research process. After all, just deciding what questions to study and how involves judgments that could be influenced by values and beliefs.

As you encounter research in this book (or your own informal research and assessments in your work with children), think about how well the studies meet the standards of *reliability*, *validity*, *trustworthiness*, *absence of bias*, and *generalization*. But most of what you encounter about child development will be from sources other than this book. How will you think critically and evaluate these sources?

Cultural Sensitivity in Research

This chapter is about theory and research in child development, so it makes sense to ask how we can relate positively to all children in the research conducted in child development. This question has been studied, as you can see in the *Relating to Every Child* feature.

RELATING TO EVERY CHILD

Cultural Sensitivity in Child Development Research

IN 2001 the American Psychological Association, the National Institute of Mental Health, and the Fordham University Center for Ethics Education held a conference on research ethics involving ethnic minority children and youth. They identified 32 key issues in research organized around four critical dimensions of research that support ethical behavior: “a) applying a cultural perspective to the evaluation of research risks and benefits; b) developing and implementing respectful informed

consent procedures; c) constructing confidentiality and disclosure policies sensitive to cultural values; and d) engaging in community and participant consultation” (C. B. Fisher et al., 2002, p. 1025). Table 2.6 gives some examples of each dimension. Community-based research, discussed earlier in this chapter, is an example of culturally sensitive research that attempts to understand and honor the culture of the participants.

TABLE 2.6 • Cultural Sensitivity in Research with Ethnic Minority Children and Youths

DIMENSION	EXAMPLE ISSUES AND GUIDELINES
Cultural Perspective in Evaluating Research Risks and Benefits	<ul style="list-style-type: none"> • Take care in defining race, ethnicity, and culture. Avoid overgeneralizations. • Select assessment instruments with norms that fit the groups being studied. • Examine the roles of prejudice and discrimination in development. • Study resilience as well as vulnerability in ethnic minority children. • Make sure research teams have appropriate cultural knowledge and awareness of their own biases.
Respectful Informed Consent Procedures	<ul style="list-style-type: none"> • Use community organizations to educate prospective participants about the research. • Use language understood by the participants and their families. • Be sensitive to concerns about signed forms and to children’s cultural expectations about authority. • Select fair and noncoercive compensation for research participation. Consult with community leaders to be sure. • Explain to participants recruited from community services that refusing to participate in the research will not limit access to the service.
Culturally Sensitive Confidentiality and Disclosure Policies	<ul style="list-style-type: none"> • Take extra precautions to protect privacy of participants from small towns or rural settings where everyone knows everyone. • Be sensitive to cultural expectations and values about confidentiality.
Community and Participant Consultation	<ul style="list-style-type: none"> • Maintain an ongoing dialogue with community members about the goals of the research. • Be prepared to modify research based on community input. • All researchers on the team, not just those who are members of the same ethnic group as the participants, should be aware of community concerns. • Include a description of the community consultation procedures in the research report.

Source: Based on Fisher, C. B., et al. (2002). Research ethics for mental health science involving ethnic minority children and youths. *American Psychologist*, 57, 1024–1040.

Who Says? Evaluating Sources

It is likely that much of what you have learned about many topics, including child development, came from the media and the Internet. You are not alone.

MEDIA. Newspapers, magazines, and television are the “textbooks” for most adults after college. The media is a source of information for businesses, parents, and policy makers as well. But remember, there is a “middle person” between the researcher and the media story—the journalist, television producer, magazine editor, or blogger. To make the information from research more accessible and to fit the time or length requirements of the media, research results are shortened, summarized, and simplified (Albee, 2002; Groark & McCall, 2005).

Most of the errors in media coverage of research are errors of omission, not errors of commission. In other words, what is reported and the quotes from scientists tend to be accurate—as far as they go. But details of methods and qualifications about the findings (e.g., under what conditions they might not apply, limitations on generalization beyond the sample, etc.) are not covered (Albee, 2002; McCall, 1987). Christina Groark and Robert McCall (2005) described six criteria for what makes “news.”

- **Recent:** Journalists love to report a new study, one just published or presented at a conference. These journalists don’t wait for replication, so readers may get the impression that the results of the one study are true and will stand the test of time.
- **New/Conflicting Information:** News is especially newsworthy if it contradicts earlier information.
- **Unusual:** The more surprising the new information, the more it “makes the news.”
- **Controversial:** Journalists don’t like inconclusive findings or scholarly debates.
- **Public Interest:** Newsworthy stories have to appeal to many people so expect more stories about weight loss research and fewer about algebraic reasoning.
- **Fame:** Celebrities’ views on or activities related to schools or child-care options make the news, even if the famous know nothing special about the subject.

Keep these criteria in mind when you read about child development studies in the media. What you read could be fairly accurate, but much information is not available because it is not considered “news.”

JOURNALS. A number of excellent journals in child development are published by professional organizations, as you can see in Table 2.7. These are only a few of the journals that publish research on child and adolescent development. If you read articles from these journals, you will get complete information, but be prepared for academic writing that generally is quite technical. The articles in scholarly journals do not exactly read like novels.

TABLE 2.7 • Examples of Journals in Child Development

JOURNAL	ORGANIZATION/PUBLISHER	WEB SITE
<i>Child Development</i>	Society for Research in Child Development	srcd.org
<i>Developmental Psychology</i>	American Psychological Association	apa.org
<i>Journal of Applied Developmental Psychology</i>	Elsevier	elsevier.com
<i>Developmental Review</i>	Elsevier	elsevier.com
<i>Journal of Experimental Child Psychology</i>	Elsevier	elsevier.com
<i>Merrill Palmer Quarterly</i>	Wayne State University	asu.edu/clas/ssfd/mpq
<i>Cognitive Development</i>	Jean Piaget Society	piaget.org
<i>British Journal of Developmental Psychology</i>	British Psychological Society	bps.org.uk
<i>Journal of Adolescence</i>	Elsevier	elsevier.com
<i>Journal of Child Language</i>	Cambridge University Press	cambridge.org/journals
<i>Early Childhood Research Quarterly</i>	National Association for the Education of Young Children (NAEYC)	naeyc.org
<i>Journal of Abnormal Child Psychology</i>	International Society for Research in Child and Adolescent Psychopathology	devepi.mc.duke.edu/isrcap
<i>Infant Behavior and Development</i>	Elsevier	elsevier.com
<i>Childhood: A Global Journal of Child Research</i>	Norwegian Centre for Child Research (NOSEB)	svt.ntnu.no/noseb/english

You can have confidence in the information from research journals such as those in Table 2.7 because they employ a rigorous evaluation process, called **peer review**, for all the articles. Several scholars who are experts in the area review every manuscript sent to a research journal. Your challenge in reading these articles will be to decide if the studies and findings apply to the children you are interested in. Look to the description of the sample and to the discussion of limitations to think critically about these questions.

THE INTERNET. It is impossible to estimate how much information about child development is available on the Internet—try any search engine. All of the child development societies and organizations in Table 2.7 have Web sites with information. Any topic has resources on the Internet. The challenge is thinking critically about what is available. One guide for evaluating Web sites from the Ithaca College Library (Ithaca, New York) gives these tips: Make sure you are in the right place. When in doubt, doubt. Consider the source. Know what is happening. Look at details. Distinguish Web pages from pages (in books, magazines, newspapers, or journals) that can be found on the Web. To be more specific, the library recommends asking these questions:

- *Authority:* Who are the authors of the Web page, or who is responsible for it? What gives them the authority or expertise to write?
- *Accuracy:* Do you have good reason to believe that the information on the site is accurate? Do the authors provide any supportive evidence for their conclusions?
- *Objectivity:* What is the author's point of view? What is the purpose of the site? Is this a commercial, governmental, professional, personal, or academic Web site?
- *Details:* Are there misspelled words or examples of poor grammar? Do the links work? Has the site been kept up-to-date? Is the site well organized? Was this page designed for the Web, or is it something else, such as a government document or a journal article, that happens to be available through the Web?
- *Value:* Does this site address the topic you are researching? Was the page worth visiting? Does the site offer anything informative, unique, or insightful? (<http://www.ithacalibrary.com/sp/subjects/guide.php?subject=thinking>)

✓ Check your understanding in the Pearson etext

SUMMARY

• Diversity in the Study of Development

Questions of child development increasingly require multidisciplinary research and the efforts of psychologists, educators, pediatricians, linguists, sociologists, and others using the tools and knowledge from their fields. All children develop in cultural contexts, so diversity and multicultural resources are integral to research in the field. With multiple disciplines and cultures come multiple methods for studying the “what” and “why” questions of child development. This research has led to multiple theories of development—some all-encompassing, grand theories and others more specific.

• Explanations of Development

Ethology is the study of how behaviors adapt to support the survival of all animals, including humans. Imprinting and attachment are two key concepts. Sociobiologists

study the adaptive value of other behavior patterns besides imprinting.

Freud believed that the conflicts between inborn drives and the demands of society resulted in five stages of psychosexual development—oral, anal, phallic, latency, and genital. If the conflicts of one stage are not resolved, Freud suggested that the individual could become fixated at that stage. Erikson's psychosocial theory emphasized the emergence of the self, the search for identity, the individual's relationships with others, and the role of culture throughout life. At eight different stages between infancy and adulthood, Erikson suggested that the individual faces a developmental crisis that can be resolved by embracing an extreme position or by the healthier stance of finding a balance.

Classical and operant conditioning explain how associations and consequences shape behaviors for humans

and animals. Consequences that increase behaviors are called *reinforcers*, and consequences that decrease behaviors are called *punishers*. Bandura's social learning theory adds an element to reinforcement and punishment—people can learn by observing others, not just by experiencing consequences themselves. Social cognitive theory also includes learning from observing but adds cognitive factors such as beliefs, self-perceptions, and expectations. Self-efficacy is a key concept in social cognitive theory. Information processing theories are concerned with how attention, working memory, long-term memory, prior knowledge, and executive control develop and affect development.

Piaget's theory of cognitive development focuses on changes in children's thinking over time and the processes that move thinking forward: equilibration (that balances assimilation and accommodation), activity, maturation, and social transmission. Piaget believed that all children move through four stages in the same order as their thinking develops: sensorimotor, preoperational, operational, and formal operational. Neo-Piagetian theories add knowledge from information processing about the development of memory and attention to Piaget's insights about different thinking abilities to explain how children develop in stages within specific domains such as numerical concepts, spatial concepts, social tasks, storytelling, reasoning about physical objects, or motor development.

- **Contextual and Dynamic Systems Theories**

Vygotsky believed that human activities take place in cultural settings and cannot be understood apart from these settings. One of his key ideas was that our specific mental structures and processes could be traced to our interactions with others as we co-construct understandings. Vygotsky believed that all higher-order mental processes, such as reasoning and problem solving, are *mediated* psychological tools, such as language. The zone of proximal development (ZPD) is the area between the child's current development level of independent problem solving and the level of development that the child could achieve with scaffolding from adults or more capable peers.

Bronfenbrenner created a developmental systems theory to map the many interacting social contexts that affect development. He suggested that every person lives within a *microsystem* (immediate relationships

and activities), inside a *mesosystem* (interactions and relationships among all the elements of the microsystem), and embedded in an *exosystem* (all the social settings that affect the child), all of which are a part of the *macrosystem* (cultural and societal laws, customs, rituals, resources, and cultural tools) that occurs in time, the *chronosystem*. Influences in all social systems are reciprocal. Thelen's theory is also a developmental systems approach that emphasizes the coaction of nature and nurture, in the form of the individual–context relationships. The theories of Vygotsky, Bronfenbrenner, and Thelen avoid either/or splits and simple explanations. Humans develop in a complex, connected system of influences.

- **Where Do the Theories Come From? Research Methods and Designs**

In the beginning, theories provide the research hypotheses to be tested or the questions examined. Then researchers identify a sample that represents the children they want to learn about; select a research design (correlational, experimental, clinical interview, case study, or ethnography); gather data by observing, asking questions, assessing tests or performances, or using psychophysiological measures; then analyze data with appropriate methods. Correlational methods identify relationships and allow predictions. Experimental studies allow researchers to detect causes, not just make predictions. Clinical interviews, case studies, and ethnographies look in detail at the experiences of a few individuals or groups. If participants are studied over time, the research is called longitudinal. If researchers intensively study cognitive processes in the midst of change—as the change is actually happening—over several sessions or weeks, then the research is microgenetic. No matter what method is used, results from the research are used to further develop and improve theories, so that even better hypotheses and questions can be developed to guide future research.

- **Issues in Child Development Research**

The goal of research in child development is to *understand* development and also to use this knowledge to *improve* the lives of children and families. To protect the second goal, institutional review boards (IRBs) evaluate every study involving human subjects conducted at universities and other research institutions such as hospitals or mental health agencies. Ethical considerations evaluated by these boards include protecting children from harm, gaining informed consent, carefully monitoring the use of incentives

and pressures on participants, maintaining confidentiality and privacy, learning the results of the study, and cultural sensitivity.

The goal of basic research is to develop pure scientific knowledge—to understand and explain phenomena in the world. The goal of applied research is to identify principles and guidelines for action, intervention, teaching, and public policy. But even with the renewed interest in policy and practice, today the pendulum is swinging back to the research methods of the physical sciences. The U.S. government is making a strong push for evidence-based social programs in all areas—mental health, medicine, and education. But there is a caution in schools. “Treatments” in education are much more complex and unpredictable than administering one drug or another in medicine. In addition, every educational program is changed by classroom conditions and the way it is implemented.

Community-based research is conducted by, with, and for communities. The goal is to develop and improve services for a specific community group, in contrast to pursuing scientific and academic communities’ intellectual interests. The results of this research may not generalize

to other communities, but only to the setting where the research was conducted.

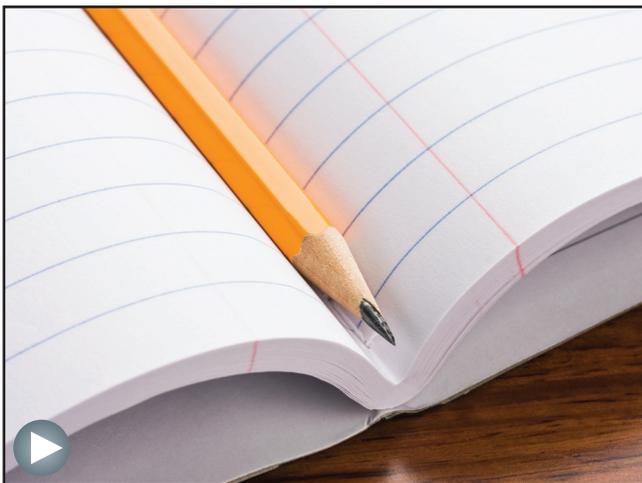
To be a critical consumer of research, readers should consider reliability, validity, generalizability, and absence of bias. *Reliability* is the repeatability or stability of a measure. *Validity* means the judgments and decisions based on the procedures are appropriate and sound. *External validity* means the findings are valid outside the original group studied. *Ecological validity* means the results have meaning for children in real situations in the real world. Cultural sensitivity involves (a) use of a cultural perspective, (b) respectful informed consent procedures, (c) confidentiality and disclosure policies sensitive to cultural values, and (d) community and participant consultation.

Most of the errors in media coverage of research are errors of omission, not errors of commission. Details of methods and qualifications about the findings may not be covered. You can have confidence in the information in the child development research journals listed in this chapter because those journals use a rigorous evaluation process, called peer review, for all the articles. To evaluate Web pages, make sure you are in the right place. When in doubt, doubt. Consider the source. Know what is happening. Look at details.

PRACTICE USING WHAT YOU HAVE LEARNED

To access and complete the exercises, click the play buttons on the images below.

Applying Vygotsky’s Ideas in the Classroom



Action Research



KEY TERMS

- accommodation 43
 action research 56
 appropriating 47
 assessment bias 64
 assimilation 43
 attention 41
 aversive 38
 behaviorism 37
 bioecological model 47
 case study 55
 classical conditioning 37
 clinical interview 55
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THE CASEBOOK

GIVING PERMISSION FOR CHILDREN TO PARTICIPATE IN RESEARCH

Today, there are many procedures to protect children and adolescents when they participate in research. One of the most important is informed consent from parents or guardians.

WHAT WOULD THEY DO?

Here is how some professionals from several fields responded to the informed consent permission form at the beginning of the chapter:

CAROL APPLE—Staffing and Compliance Coordinator

Hillsborough County School District—Tampa, FL

As a parent evaluating this permission document, I feel that it appears to adequately cover most initial concerns of purpose, procedures, confidentiality, and granting informed consent. However, the document does lack specific examples of the types of survey questions the students will be asked to respond to, which could be of concern to parents.

The risks (or lack thereof) and benefits are clearly outlined and appear to follow the U.S. Department of Health and Human Services protocol for involving children in research:

- Present minimal risk to the child: The child will be participating in a survey that has confidentiality safeguards in place.
- Project has direct benefits for the child (or related group of children): The study will determine effective academic environments for teaching math.
- Provide for parent permission: Right to refuse or discontinue without penalty.

One additional area that could have been addressed, considering that middle-school-age children are the subject of the study, is gaining their “assent” to participate. In other words, provide an opportunity to the child to express *her* or *his* willingness to participate in the study with fidelity. Having these concerns adequately addressed, consent could be given without hesitation.

**VICKY ZYGOURIS-COE—Researcher; Associate Professor
of Education**

University of Central Florida—Orlando, FL

Yes, I would sign the consent form. As a parent, I would think that the researchers focused on protecting the rights of minors. They adhered to research guidelines, and they informed parents of the purpose of the study, procedures, and anticipated risks involved. I particularly liked the fact that participation is voluntary and the participants can withdraw from the study without any penalty or risk involved. After reading this form, I also learned more about what is involved in research; as a parent, I would feel educated and informed about research study participation and potential benefits of this research. The fact that I know who will be conducting the study, how the study will take place and for how long, what will be involved with this study, and what will happen to the student data the researchers collect makes me feel comfortable with the entire process.

Participants in the study will be protected as follows:

(a) participation is voluntary; (b) the study meets ethical treatment of minors guidelines as specified by the institutional review board; (c) there are no anticipated risks involved; (d) student data will be treated with confidentiality; and (e) participants can withdraw from the study at any point without any penalty or risk involved.

GINA STOCKS—Lecturer

Sul Ross State University—Rio Grande College—Uvalde, TX

My perspective on research involving students is twofold. I am a parent of two children attending public school, and I am an educator myself. As an educator, I understand the importance of credible, valid research and its potential influence for improving conditions within our schools. My familiarity with the research process is what allows me to be in favor of my children participating in such an activity. That said, educational documents themselves can be very intimidating. The formal nature of an informed consent document such as this can easily result in a parent feeling guarded. Terminology common to these documents (*tasks, risks, confidentiality, legal rights*) might raise a sense of caution unless the process is thoroughly discussed. As a parent I would appreciate this being explained in an informal parent meeting, school assembly, or conference session rather than receiving it in the mail or via my child.

The informed consent procedure ensures the safety of students by explaining in detail what procedures will be followed as well as allowing for refusal to participate with no obligation. I believe the process of receiving informed consent is clearly stating that my child's well-being is more important than any outcomes that might be a result of the research being conducted.