GLOBAL EDITION

Lifespan Development

SEVENTH EDITION

Denise Boyd • Helen Bee

ALWAYS LEARNING

PEARSON

Lifespan **Development**

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Lifespan **Development**

Seventh Edition

Global Edition

Denise **Boyd**

Houston Community College System

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PEARSON

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This book is dedicated to my husband, Jerry Boyd,
in appreciation for the help and support he provided to me
while I was preparing the seventh edition of
Lifespan Development.

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Contents

Preface

Having taught human development for many years, I know that teaching a course in lifespan development is one of the most difficult assignments an instructor can face. You must deal with the challenge of getting through all the necessary descriptive material in a single semester. At the same time, you have to cover theories of development, some of which are among the most complex and important theories in the behavioral sciences. In preparing this seventh edition of *Lifespan Development*, I hoped to support lifespan development instructors by producing a textbook that thoroughly addresses the basic facts of development, makes the more abstract material about theories understandable to students, and motivates them to read the book by presenting information in a way that is both engaging and relevant to real-world applications of developmental science.

New to the Seventh Edition

Following are some highlights of this new edition:

- **In-text references to MyVirtualLife and MyPsychLab video series.** At the beginning of each chapter, students are prompted to relate the material in the chapter to *MyVirtualLife*, an engaging online simulation tool that allows users to raise a virtual child to live their own virtual lives. Once the virtual child has been raised, the students shift to exploring simulated outcomes of important life decisions such as career selection. New icons prompt students to access the exciting new MyPsychLab video series.
- **DSM-5 updates.** Discussions of mental health issues have been updated to conform to DSM-5 terminology and diagnostic criteria.
- **New and expanded coverage of atypical development and mental health.** This edition includes new information on these important mental health topics:
  - Reactive attachment disorder (Chapter 6)
  - Autism spectrum disorders (Chapter 6)
  - Disruptive mood dysregulation disorder (Chapter 8)
  - Childhood-onset conduct disorder (Chapter 10, Chapter 12)
  - Adolescent-onset conduct disorder (Chapter 12)
  - Bipolar disorder (Chapter 13)
  - Complicated grief (Chapter 19)
- **Improved art program.** A number of new figures have been added to this edition, while other figures and tables have been revised and updated with new illustrations.

LEARNING OBJECTIVES. The numbered learning objective questions are now more prominent in the seventh edition. These objectives are listed in the chapter opener, called out in their corresponding sections, and repeated in the chapter summary to facilitate student review. In addition, the Instructor's Manual and Test Bank correspond to these learning objectives, allowing you to assess your students' knowledge of key educational objectives.

TEST YOURSELF BEFORE GOING ON. The end of each section now contains brief quizzes with multiple-choice, true/false, fill-in-the-blank, and critical thinking questions for students to test their knowledge before moving on to the next section. The answers to these questions are provided at the back of the text.

CHAPTER TEST. A 25-question multiple-choice practice test now appears at the end of every chapter. The answers are provided at the back of the text, allowing students to assess their knowledge and prepare for course quizzes and exams.

INTEGRATED **MyPsychLab** RESOURCES. Throughout the text, we have placed MyPsychLab icons indicating where students can go to find web-based videos, simulations, and expanded information on particular topics. Many more resources are available in addition to those highlighted in the text, but the icons draw attention to some of the most high-interest materials available on www.MyPsychLab.com.

MyPsychLab

Watch the **Video** in **MyPsychLab**

Explore the **Concept** in **MyPsychLab**

Simulate the **Experiment** in **MyPsychLab**

Study and **Review** in **MyPsychLab**

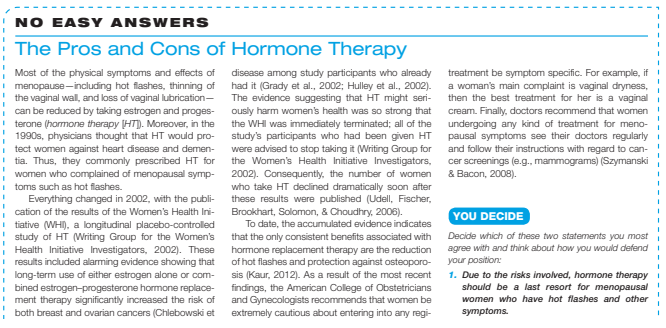
UPDATED RESEARCH.

- Genetic basis of neurodevelopmental disorders (Chapter 3)
- Language development in hearing infants of deaf parents (Chapter 5)
- Predictive validity of infant IQ tests (Chapter 5)
- Paternal influences on social development (Chapter 6)
- Genetics of hand dominance (Chapter 7)
- Insecure attachment and preschoolers' self-esteem (Chapter 8)
- Individual differences in the effects of spanking (Chapter 8)
- Cultural influences on the development of children's real and ideal selves (Chapter 10)
- Shifts in academic goals and their effects on children's achievement at the transition to middle school (Chapter 11)
- "Americanized" behavior as a source of conflict between immigrant teens and their parents (Chapter 12)
- Neurological basis of gender differences in responses to emotion-provoking stimuli (Chapter 13)
- Personality and career satisfaction (Chapter 14)
- Brain aging and image processing (Chapter 15)
- Effects of chronic disease on brain aging (Chapter 15)
- Terminal decline (Chapter 17)
- Depression among immigrant elders (Chapter 18)
- Effects of experience on information processing speed among the elderly (Chapter 18)
- Influence of young celebrities' deaths on their popularity among young adults (Chapter 19)

Themed Essays

NO EASY ANSWERS. The *No Easy Answers* essays introduce students to the idea that there are many questions for which developmental psychologists cannot provide definitive answers. For example, the essay in Chapter 15 deals with hormone therapy and discusses the benefits and potential risks of this therapy. Students are asked to take a stand on whether they feel that, due to the risks involved, hormone therapy should be a last resort or that, since no medical treatment is entirely free of risk, women should feel free to take hormone therapy to help relieve some of their menopausal symptoms.

I developed these discussions in response to my own students' continuing difficulty in understanding that psychology is not a science that can offer straightforward recipes for perfect behavioral outcomes. My hope is that, by reading these discussions, students will become more sensitive to the complexity of human development and more tolerant of the ambiguities inherent in the behavioral and social sciences.



NO EASY ANSWERS

The Pros and Cons of Hormone Therapy

Most of the physical symptoms and effects of menopause—including hot flashes, thinning of the vaginal wall, and loss of vaginal lubrication—can be reduced by taking estrogen and progesterone (*hormone therapy* [*HT*]). Moreover, in the 1990s, physicians thought that HT would protect women against heart disease and dementia. Thus, they commonly prescribed HT for women who complained of menopausal symptoms such as hot flashes.

Everything changed in 2002, with the publication of the results of the Women's Health Initiative (WHI), a longitudinal placebo-controlled study of HT (Writing Group for the Women's Health Initiative Investigators, 2002). These results included alarming evidence showing that long-term use of either estrogen alone or combined estrogen–progesterone hormone replacement therapy significantly increased the risk of both breast and ovarian cancers (Chlebowski et

disease among study participants who already had it (Grady et al., 2002; Hulley et al., 2002). The evidence suggesting that HT might seriously harm women's health was so strong that the WHI was immediately terminated; all of the study's participants who had been given HT were advised to stop taking it (Writing Group for the Women's Health Initiative Investigators, 2002). Consequently, the number of women who take HT declined dramatically soon after these results were published (Udell, Fischer, Brookhart, Solomon, & Choudhry, 2006).

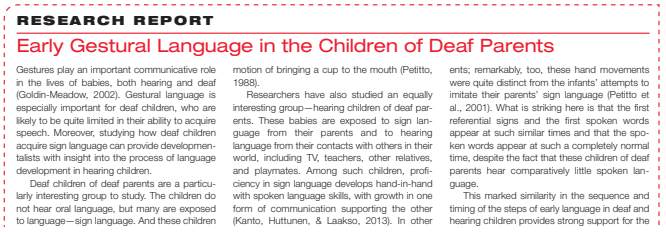
To date, the accumulated evidence indicates that the only consistent benefits associated with hormone replacement therapy are the reduction of hot flashes and protection against osteoporosis (Kaur, 2012). As a result of the most recent findings, the American College of Obstetricians and Gynecologists recommends that women be extremely cautious about entering into any regi-

treatment be symptom specific. For example, if a woman's main complaint is vaginal dryness, then the best treatment for her is a vaginal cream. Finally, doctors recommend that women undergoing any kind of treatment for menopausal symptoms see their doctors regularly and follow their instructions with regard to cancer screenings (e.g., mammograms) (Szymanski & Bacon, 2008).

YOU DECIDE

Decide which of these two statements you most agree with and think about how you would defend your position:

1. ***Due to the risks involved, hormone therapy should be a last resort for menopausal women who have hot flashes and other symptoms.***



RESEARCH REPORT

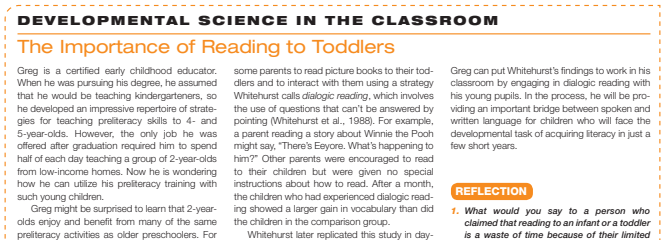
Early Gestural Language in the Children of Deaf Parents

Gestures play an important communicative role in the lives of babies, both hearing and deaf (Goldin-Meadow, 2002). Gestural language is especially important for deaf children, who are likely to be quite limited in their ability to acquire speech. Moreover, studying how deaf children acquire sign language can provide developmentalists with insight into the process of language development in hearing children.

Deaf children of deaf parents are a particularly interesting group to study. The children do not hear oral language, but many are exposed to language—sign language. And these children motion of bringing a cup to the mouth (Petitto, 1988).

Researchers have also studied an equally interesting group—hearing children of deaf parents. These babies are exposed to sign language from their parents and to hearing language from their contacts with others in their world, including TV, teachers, other relatives, and playmates. Among such children, proficiency in sign language develops hand-in-hand with spoken language skills, with growth in one form of communication supporting the other (Kanto, Huttunen, & Laakso, 2013). In other ents; remarkably, too, these hand movements were quite distinct from the infants' attempts to imitate their parents' sign language (Petitto et al., 2001). What is striking here is that the first referential signs and the first spoken words appear at such similar times and that the spoken words appear at such a completely normal time, despite the fact that these children of deaf parents hear comparatively little spoken language.

This marked similarity in the sequence and timing of the steps of early language in deaf and hearing children provides strong support for the



DEVELOPMENTAL SCIENCE IN THE CLASSROOM

The Importance of Reading to Toddlers

Greg is a certified early childhood educator. When he was pursuing his degree, he assumed that he would be teaching kindergarteners, so he developed an impressive repertoire of strategies for teaching preliteracy skills to 4- and 5-year-olds. However, the only job he was offered after graduation required him to spend half of each day teaching a group of 2-year-olds from low-income homes. Now he is wondering how he can utilize his preliteracy training with such young children.

Greg might be surprised to learn that 2-year-olds enjoy and benefit from many of the same preliteracy activities as older preschoolers. For some parents to read picture books to their toddlers and to interact with them using a strategy Whitehurst calls *dialogic reading*, which involves the use of questions that can't be answered by pointing (Whitehurst et al., 1988). For example, a parent reading a story about Winnie the Pooh might say, "There's Eeyore. What's happening to him?" Other parents were encouraged to read to their children but were given no special instructions about how to read. After a month, the children who had experienced dialogic reading showed a larger gain in vocabulary than did the children in the comparison group.

Whitehurst later replicated this study in day- Greg can put Whitehurst's findings to work in his classroom by engaging in dialogic reading with his young pupils. In the process, he will be providing an important bridge between spoken and written language for children who will face the developmental task of acquiring literacy in just a few short years.

REFLECTION

1. *What would you say to a person who claimed that reading to an infant or a toddler is a waste of time because of their limited*

RESEARCH REPORT. These essays provide detailed accounts of specific research studies. For example, Chapter 5 discusses research on early gestural language in the children of deaf parents, and Chapter 17 examines research on mild cognitive impairment and Alzheimer's disease. "Critical Analysis" questions appear at the end of each feature to help students assess the research and make connections between the research study and their daily lives.

DEVELOPMENTAL SCIENCE. *Developmental Science* essays explore practical applications of developmental theory and research. For example, the *Developmental Science in the Classroom* essay in Chapter 5 discusses the importance of reading to toddlers. Likewise, *Developmental Science in the Clinic* in Chapter 11 examines crisis intervention for pregnant teenagers, and *Developmental Science at Home* in Chapter 6 addresses choosing a day-care center. Each of these essays opens with a brief real-life vignette and concludes with "Reflection" questions.

Supplements for the Instructor

We have designed a collection of instructor resources for this edition that will help you prepare for class, enhance your course presentations, and assess your students' understanding of the material. These are available only to qualified instructors using the text. Please contact your local publishing representative for more information.

- **MyVirtualLife.** Raise your child. Live your life. MyVirtualLife is two simulations in one. The first simulation allows students to raise a child from birth to age 18 and monitor the effects of their parenting decisions over time. In the second simulation, students make first-person decisions and see the impacts of those decisions on their simulated future self over time. By incorporating physical, social, emotional, and cognitive development throughout the entire lifespan, MyVirtualLife helps students think critically as they apply their course work to their own virtual life. You can access MyVirtualLife within MyPsychLab or as a standalone product.
- **MyPsychLab.** Available at www.MyPsychLab.com, MyPsychLab is an online homework, tutorial, and assessment program that truly engages students in learning. It helps students better prepare for class, quizzes, and exams—resulting in better performance in the course. It provides educators a dynamic set of tools for gauging individual and class performance:
  - **Customizable.** MyPsychLab is customizable. Instructors can choose what a course looks like by easily turning homework, applications, and more on and off.

- **Blackboard single sign-on.** MyPsychLab can be used by itself or linked to any course management system. Blackboard single sign-on provides deep linking to all new MyPsychLab resources.
- **Pearson eText.** As with the printed text, with the eText, students can highlight relevant passages and add notes. The Pearson eText can be accessed through laptops, iPads, and tablets. Download the free Pearson eText app to use on tablets.
- **Assignment calendar and gradebook.** A drag-and-drop assignment calendar makes assigning and completing work easy. The automatically graded assessment provides instant feedback and flows into the gradebook, which can be used in MyPsychLab or exported.
- **Personalized study plan.** Students' personalized plans promote better critical thinking skills. The study plan organizes students' study needs into sections, such as Remembering, Understanding, Applying, and Analyzing.
- **MyPsychLab margin icons.** Margin icons guide students from their reading material to relevant videos and activities.
- **Class preparation tool.** Available for instructors within MyPsychLab, this exciting instructor resource makes lecture preparation easier and less time-consuming. MyClassPrep collects the very best class preparation resources—art and figures from our leading texts, videos, lecture activities, classroom activities, demonstrations, and much more—in one convenient online destination. You can search through MyClassPrep's extensive database of tools by content topic or by content type. You can select resources appropriate for your lecture, many of which can be downloaded directly; or you can build your own folder of resources and present from within MyClassPrep.

- **Instructor's Manual.** The Instructor's Manual has been thoroughly revised and reorganized to be even more user friendly. Each chapter has the following resources: "At-a-Glance" grids, showcasing key supplemental resources available for instructors and students by chapter; a Chapter Overview; a list of the numbered Learning Objectives; and a complete Key Terms table, with page references. Each chapter also offers an extensive, detailed, and fully integrated Teaching Notes section with Discussion Launchers, Feature Box Activities, lists of available media to use in the classroom, Classroom Activity ideas, and Critical Thinking Questions. The Teaching Notes are closely tied to the numbered learning objectives from the text so you can easily connect the content of this manual to the corresponding learning objectives. For instructors looking to expand upon the textbook content, each chapter closes with an optional relevant Lecture Enhancer.
- **Test Bank.** The Test Bank is composed of approximately 2,000 fully referenced multiple-choice, short-answer, and essay questions. The test questions are tied to the numbered learning objectives from the text, allowing you to assess knowledge of specific skills, as well as APA Learning Outcomes. In addition, questions may be viewed by level of difficulty and skill type. This supplement is also available in MyTest, a computerized Test Bank version that allows for easy creation of polished hard-copy tests.
- **PowerPoint presentations.** The lecture slides include both a detailed lecture outline with select art from the text and a set of slides containing the complete art program from the book. The PowerPoint lecture slides are available for download via the Pearson Instructor's Resource Center (www.pearsonglobaleditions.com/Boyd) and on the MyPsychLab platform (www.MyPsychLab.com).

Video Resources for Instructors

The development video series in MyPsychLab engages students and brings to life a wide range of topics spanning the prenatal period through the end of the lifespan. This video collection contains a rich assortment of updated video clips for each chapter, including new sketchnote-style tutorials as well as cross-cultural footage and applied segments featuring real students

sharing their experiences. Many of these video segments are tied to quizzes or writing prompts and can be assigned through MyPsychLab.

Print and Media Supplements for the Student

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

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

- ***MyVirtualLife.*** Raise your child. Live your life. MyVirtualLife is two simulations in one. The first simulation allows students to raise a child from birth to age 18 and monitor the effects of their parenting decisions over time. In the second simulation, students make first-person decisions and see the impact of those decisions on their simulated future self over time. By incorporating physical, social, emotional, and cognitive development throughout the entire lifespan, MyVirtualLife helps students think critically as they apply their course work to their own virtual life. You can access MyVirtualLife within MyPsychLab.

- ***CourseSmart eTextbook*.*** CourseSmart offers students an online subscription to *Lifespan Development*, seventh edition, at up to a 60% savings. With the CourseSmart eTextbook, students can search the text, make notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages. Ask your Pearson sales representative for details or visit www.coursesmart.co.uk.

Supplementary Texts

Contact your Pearson representative to package any of these supplementary texts with *Lifespan Development*, seventh edition:

- ***Current Directions in Developmental Psychology*** **(ISBN: 0205597505).** This exciting reader includes more than 20 articles from the American Psychological Society that have been carefully selected for the undergraduate audience and taken from the very accessible *Current Directions in Psychological Science* journal. These timely, cutting-edge articles allow instructors to bring their students a real-world perspective about today's most current and pressing issues in psychology. The journal is discounted when packaged with this text for college adoptions.

- ***Twenty Studies That Revolutionized Child Psychology*** **by Wallace E. Dixon, Jr. (ISBN: 0130415723).** Presenting the seminal research studies that have shaped modern developmental psychology, this brief text provides an overview of the environment that gave rise to each study, its experimental design, its findings, and its impact on current thinking in the discipline.

- ***Human Development in Multicultural Contexts: A Book of Readings*** **(ISBN: 0130195235).** Written by Michele A. Paludi, this compilation of readings highlights cultural influences in developmental psychology.

- ***The Psychology Major: Careers and Strategies for Success*** **(ISBN: 0205684688).** Written by Eric Landrum (Idaho State University), Stephen Davis (Emporia State University), and Terri Landrum (Idaho State University), this 160-page paperback provides valuable

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information on career options available to psychology majors, tips for improving academic performance, and a guide to the APA style of research reporting.

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—Denise Boyd

chapter 1

Human Development and Research Methodology

The last time you saw a relative or friend whom you hadn't seen for a while, perhaps you remarked on how much or how little the person had changed. About a child, you may have said: "Sally's grown so much since the last time I saw her." About an older person: "Uncle Julio looks much more frail than he did at Grandpa's birthday party." Such comments suggest that we humans are natural observers of the ways in which we change with age. But we also notice characteristics that seem to stay the same over time. We might say,

LEARNING OBJECTIVES

AN INTRODUCTION TO HUMAN DEVELOPMENT

- **1.1** What ideas about development were proposed by early philosophers and scientists?
- **1.2** What is the lifespan perspective?
- **1.3** What major domains and periods do developmental scientists use to organize their discussions of the human lifespan?

KEY ISSUES IN THE STUDY OF HUMAN DEVELOPMENT

- **1.4** How do developmentalists view the two sides of the nature–nurture debate?
- **1.5** What is the continuity–discontinuity debate?
- **1.6** How do the three kinds of age-related change differ?
- **1.7** How does consideration of the contexts in which change occurs improve scientists' understanding of human development?

RESEARCH METHODS AND DESIGNS

- **1.8** What are the goals of scientists who study human development?
- **1.9** What descriptive methods do developmental scientists use?
- **1.10** What is the primary advantage of the experimental method?
- **1.11** What are the pros and cons of cross-sectional, longitudinal, and sequential research designs?
- **1.12** Why is cross-cultural research important to the study of human development?
- **1.13** What are the ethical standards that developmental researchers must follow?

MyVirtualLife

What decisions would you make while raising a child? What would the consequences of those decisions be?

Find out by accessing MyVirtualLife at www.MyPsychLab.com to raise a virtual child and live your own virtual life.

"Sally's always been such a sweet child," or "Uncle Julio's mind is as sharp as ever." And our powers of observation don't stop with simple descriptions. We also come up with theories to explain our observations. Perhaps you've said something like, "Sally's parents are great role models. That's probably why she's so well behaved," or "Grandpa and Uncle Julio are both pretty sharp for their age. I guess they have good genes." As these observations suggest, the developmental pathway that each person follows results from the person's own characteristics, the choices that others make for her in childhood, and the decisions that she makes for herself in adulthood. These interactive effects are the driving theme behind *MyVirtualLife*, an online simulation that allows you to raise a child to adulthood and then adopt a first-person perspective to make decisions in adulthood.

In this introductory chapter, you will learn how the science of human development came into being. You will also learn about the key issues in the scientific study of development. When you finish reading the chapter, you will be acquainted with the research designs and methods that developmentalists use.

An Introduction to Human Development

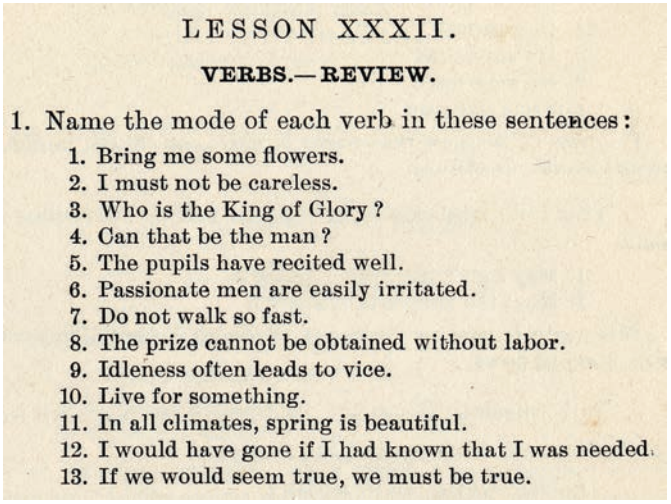
The field of **human development** is the scientific study of age-related changes in behavior, thinking, emotion, and personality. Long before the scientific method was used to study development, though, philosophers offered explanations for differences they observed in individuals of different ages. In the 19th century, the scientific methods used by early pioneers in the study of human behavior were applied to questions about age-related change. Nevertheless, the term *development* was largely confined to childhood during the early years. However, in the second half of the 20th century, behavioral scientists began to acknowledge that important age-related changes occur across the entire human lifespan. Their efforts led to useful ways of categorizing important issues in the study of development and revealed a wealth of data suggesting that human development is a highly complex process.

Philosophical and Scientific Roots

LO 1.1 What ideas about development were proposed by early philosophers and scientists?

human development the scientific study of age-related changes in behavior, thinking, emotion, and personality

Early philosophers based their ideas about development on spiritual authorities, general philosophical orientations, and deductive logic. In the 19th century, though, people who wanted to better understand human development turned to science.



LESSON XXXII.

VERBS.—REVIEW.

1. Name the mode of each verb in these sentences:

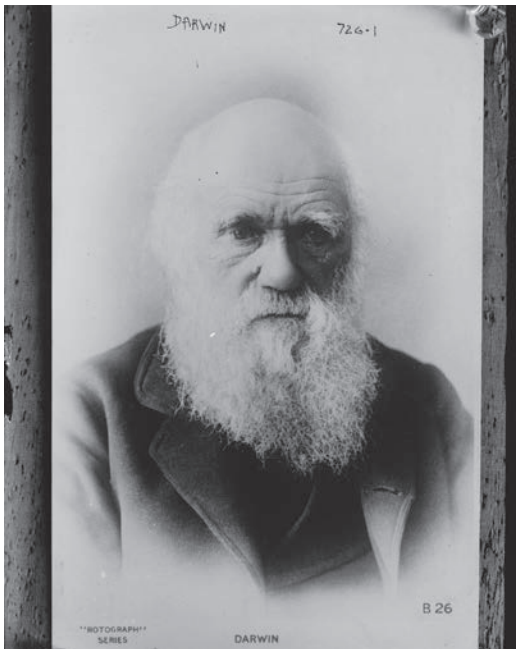
1. Bring me some flowers.
2. I must not be careless.
3. Who is the King of Glory?
4. Can that be the man?
5. The pupils have recited well.
6. Passionate men are easily irritated.
7. Do not walk so fast.
8. The prize cannot be obtained without labor.
9. Idleness often leads to vice.
10. Live for something.
11. In all climates, spring is beautiful.
12. I would have gone if I had known that I was needed.
13. If we would seem true, we must be true.

This page from the *Hoenshel's Complete Grammar*, published in 1895, illustrates the influence of the doctrine of original sin on education and child rearing. Statements that promote religious and moral principles are embedded in this exercise on verbs. The idea was that the goals of teaching grammar to children and shaping their spiritual development could be, and should be, accomplished simultaneously.

ORIGINAL SIN, THE BLANK SLATE, AND INNATE GOODNESS Typically, philosophers' inquiries into the nature of development focused on why babies, who appear to be quite similar, grow up to vary widely. They were particularly concerned with the moral dimensions of development. For example, the Christian doctrine of *original sin*, often attributed to 4th-century philosopher Augustine of Hippo, taught that all humans are born with a selfish nature. To reduce the influence of this inborn tendency toward selfishness, Augustine taught, humans must seek spiritual rebirth and submit themselves to religious training. Thus, from this perspective, developmental outcomes, both good and bad, result from each individual's struggle to overcome an inborn tendency to act immorally when doing so somehow benefits the self.

By contrast, 17th-century English philosopher John Locke drew upon a broad philosophical approach known as *empiricism* when he claimed that the mind of a child is a *blank slate*. Empiricism is the view that humans possess no innate tendencies and that all differences among humans are attributable to experience. The blank-slate view suggests that adults can mold children into whatever they want them to be. Therefore, differences among adults can be explained in terms of differences in their childhood environments rather than as a result of a struggle to overcome any kind of inborn tendencies, as the original-sin view proposed.

Different still was the *innate goodness* view proposed by 18th-century Swiss philosopher Jean-Jacques Rousseau. He claimed that all human beings are naturally good and seek out experiences that help them grow (Crain, 2011). Rousseau believed that children need only nurturing and protection to reach their full potential. Developmental outcomes are good when a child's environment refrains from interfering in her attempts to nurture her own development. In contrast, outcomes are poor when a child experiences frustration in her efforts to express the innate goodness with which she was born. Thus, the innate-goodness and original-sin approaches share the view that development involves a struggle between internal and external forces. In contrast to both, the blank-slate view sees the child as a passive recipient of environmental influences.



Charles Darwin, who fathered 10 children, initiated the scientific study of childhood. He used the same scientific methods that led to the discoveries on which he based his theory of evolution to make and record daily observations of his children's development.

EARLY SCIENTIFIC THEORIES The 19th century saw an explosion of interest in how scientific methods might be applied to questions that previously had been thought to belong within the domain of philosophy. Charles Darwin, for example, became well known for his suggestion that the wide variety of life-forms that exist on the Earth evolved gradually as a result of the interplay between environmental factors and genetic processes. Moreover, Darwin proposed that studying children's development might help scientists better understand the evolution of the human species. To that end, Darwin and other like-minded scientists kept detailed records of their own children's early development (called *baby biographies*), in the hope of finding evidence to support the theory of evolution (Dewsbury, 2009). These were the first organized studies of human development.

G. Stanley Hall of Clark University used questionnaires and interviews to study large numbers of children. His 1891 article "The Contents of Children's Minds on Entering School" represented the first scientific study of child development (White, 1992). Hall agreed with Darwin that the milestones of childhood were similar to those that had taken place in the development of the human species. He thought that developmentalists should identify **norms**, or average ages at which developmental milestones are reached. Norms, Hall said, could be used to learn about the evolution of the species as well as to track the development of individual children.

Arnold Gesell's research suggested the existence of a genetically programmed sequential pattern of change (Gesell, 1925; Thelen & Adolph, 1992). Gesell used the term **maturation** to describe such a pattern of change. He thought that maturationally determined development occurred, regardless of practice, training, or effort (Crain, 2011). For example, infants don't have to be taught how to walk. Because of his strong belief that many important developmental changes are determined by maturation, Gesell spent decades studying children and developing norms. He pioneered the use of movie cameras and one-way observation devices to study children's behavior. His findings became the basis for many **norm-referenced tests** that are used today to determine whether individual children are developing at a rate that is similar to

norms average ages at which developmental milestones are reached

maturation the gradual unfolding of a genetically programmed sequential pattern of change

norm-referenced tests standardized tests that compare an individual child's score to the average score of others her age

that of other children of the same age. Such tests help early educators find ways of helping young children whose development lags behind that of others.

The Lifespan Perspective

LO 1.2 What is the lifespan perspective?

Psychologists once thought of adulthood as a long period of stability followed by a short span of unstable years immediately preceding death. This view has changed because, for one thing, it has become common for adults to go through major life changes, such as divorce and career shifts. There has also been a significant increase in life expectancy in the industrialized world. At the beginning of the 20th century, Americans' life expectancy at birth was only 49 years. By the century's end, the expected lifespan of someone born in the United States was about 76 years. As a result, older adults now constitute a larger proportion of the U.S. population than ever before. In fact, adults over the age of 100 are one of the most rapidly growing age groups in the industrialized world.

The lifespan perspective recognizes that important changes occur throughout life.

The changes outlined above have led to the adoption of the **lifespan perspective**, the idea that important changes occur during every period of development and that these changes must be interpreted in terms of the culture and context in which they occur (Baltes, Reese, & Lipsitt, 1980). Thus, understanding change in adulthood has become just as important as understanding change in childhood, and input from many disciplines is necessary to fully explain human development. This new perspective emphasizes these key elements:

- ***Plasticity:*** Individuals of all ages possess the capacity for positive change in response to environmental demands.
- ***Interdisciplinary research:*** Research from different kinds of disciplinary perspectives (e.g., anthropology, economics, psychology) is needed to fully understand lifespan development.
- ***Multicontextual nature of development:*** Individual development occurs within several interrelated contexts (e.g., family, neighborhood, culture).

Paul Baltes (1939–2006) was a leader in the development of a comprehensive theory of lifespan human development (Baltes, Staudinger, & Lindenberger, 1999; Lerner, 2008). Baltes emphasized the positive aspects of advanced age. He pointed out that, as human beings age, they adopt strategies that help them maximize gains and compensate for losses. He cited the example of concert pianist Arthur Rubinstein, who was able to outperform much younger musicians well into his 80s (Cavanaugh & Whitbourne, 1999). Rubinstein reported that he maintained his performance capacity by carefully choosing pieces that he knew very well (maximizing gain) and by practicing those pieces more frequently than he had at earlier ages (compensating for the physical losses associated with age). You will read more about Baltes's theories and his research in Chapters 17 and 18.

lifespan perspective the current view of developmentalists that important changes occur throughout the entire human lifespan and that these changes must be interpreted in terms of the culture and context in which they occur; thus, interdisciplinary research is critical to understanding human development

The Domains and Periods of Development

LO 1.3 What major domains and periods do developmental scientists use to organize their discussions of the human lifespan?

Scientists who study age-related changes often group them in three broad categories, called *domains of development*. The **physical domain** includes changes in the size, shape, and characteristics of the body. For example, developmentalists study the physiological processes associated with puberty. Also included in this domain are changes in how individuals sense and

physical domain changes in the size, shape, and characteristics of the body

perceive the physical world, such as the gradual development of depth perception over the first year of life.

Changes in thinking, memory, problem solving, and other intellectual skills are included in the **cognitive domain**. Researchers working in the cognitive domain study topics as diverse as how children learn to read and why some memory functions deteriorate in old age. They also examine the ways in which individual differences among children and adults, such as intelligence-test scores, are related to other variables in this domain.

The **social domain** includes changes in variables associated with the relationship of an individual to others. For instance, studies of children's social skills fall into the social domain, as does research on individual differences in personality. Individuals' beliefs about themselves are also usually classified within the social domain.

Using domain classifications helps to organize discussions of human development. We need to remember, however, that the three domains do not function independently. For instance, when a girl goes through puberty—a change in the physical domain—her ability to think abstractly (cognitive domain) and her feelings about potential romantic partners (social domain) change as well.

Developmental scientists also use a system of age-related categories known as *periods of development*. The first of these, the *prenatal period*, is the only one that has clearly defined biological boundaries at its beginning and end: It begins at conception and ends at birth. The next period, *infancy*, begins at birth and ends when children begin to use language to communicate, a milestone that marks the beginning of *early childhood*. Thus, while infancy begins at birth for all children, its end point can vary from one child to another. A social event—the child's entrance into school or some other kind of formal training—marks the transition from early to *middle childhood*. Consequently, cultures vary to some degree with regard to when early childhood ends and middle childhood begins. For example, children must be enrolled in school beginning at age 4 in Scotland but not until age 8 in a few states in the United States.

By contrast, a biological milestone, puberty, signals the end of middle childhood and the beginning of *adolescence*. Again, the timing of this transition varies across individuals. And when does adolescence end? One way of answering this question is by noting the legal boundaries that different cultures set for the end of adolescence and the beginning of *early adulthood*. For instance, a person must be 18 years of age to join the military without parental permission in the United States. By contrast, the age of majority for military service is 15 in Laos, 16 in the United Kingdom, 17 in Nicaragua, 19 in Algeria, 20 in South Korea, 21 in Brazil, and 22 in Afghanistan (*CIA World Factbook*, 2013). Even within a single culture, such as the United States, legal adulthood is defined differently for different activities: 16 for driving, 17 or 18 for criminal accountability, 18 for signing contracts, 21 for buying alcohol, and 24 for economic independence with regard to college financial aid. Such variations highlight the social and psychological, rather than biological, nature of the transition to adulthood, the complexities of which have led some researchers to propose a new period of development called *emerging adulthood* that encompasses the late teens and early 20s.

The transition from early to *middle adulthood*, generally thought to occur around age 40, is even more arbitrary. The timing of biological milestones that are associated with middle age, such as menopause, varies widely from one person to another. Thus, there is no clear physical boundary between early and middle adulthood, and social boundaries are rapidly changing. For instance, childbirth, once thought of almost exclusively as an early-adulthood event, is becoming increasingly common among middle-aged women. Likewise, *late adulthood*, though customarily described as beginning at age 60, is not distinguished by any biological or social events that clearly distinguish a middle-aged adult from an older adult.

Despite the difficulties involved in defining the various periods of development, these periods can still serve as a useful system for organizing the study of development. We have organized this textbook around them. For our purposes, the first two years after birth constitute infancy. Early childhood is defined as the years between ages 2 and 6. Our chapters on middle childhood discuss development between the ages of 6 and 12. Adolescence is defined as the years from 12 to 18, and early adulthood as those between 18 and 40. Finally, the period from 40 to 60 is middle adulthood, and the years from 60 to the end of life are late adulthood.

cognitive domain changes in thinking, memory, problem solving, and other intellectual skills

social domain change in variables that are associated with the relationship of an individual to others

test yourself before going on

Study and Review in MyPsychLab

Answers to these questions can be found in the back of the book.

1. Write the name of the philosopher who is associated with each view of development.
   (1) original sin _____
   (2) blank slate _____
   (3) innate goodness _____
2. What did each of these early researchers do?
   (1) Charles Darwin _____
   (2) G. Stanley Hall _____
   (3) Arnold Gesell _____
3. The view that development from conception to death should be studied from multiple disciplinary perspectives is known as the _____ _____.
4. Give an example from the text of development in each domain.

Domain	Example
Physical	
Cognitive	
Social	

5. Fill in the milestones that mark the beginning and ending of each major period of development:

Period	Beginning Milestone	Ending Milestone
Prenatal		
Infancy		
Early childhood		
Middle childhood		
Adolescence		
Early adulthood		
Middle adulthood		
Late adulthood		

CRITICAL THINKING

6. What are the child-rearing implications of the original-sin, blank-slate, and innate-goodness views of development?

Key Issues in the Study of Human Development

Several key issues cut across all the domains and periods of development. These include the relative contributions to development of biological and environmental factors and the presence or absence of stages. In addition, one researcher might propose that a specific change is common to all human beings, while another might propose that it occurs under some conditions but not others. Researchers debate, too, the degree to which the settings in which development occurs contribute to developmental outcomes.

Nature versus Nurture

LO 1.4 How do developmentalists view the two sides of the nature–nurture debate?

Some early developmentalists thought of change as resulting from *either* forces outside the person *or* forces inside the person. The debate about the relative contributions of biological processes and experiential factors to development is known as the **nature–nurture debate**. In struggling with this important issue, psychologists have moved away from either/or approaches toward more subtle ways of looking at both types of influences. For example, the concept of *inborn biases* is based on the notion that children are born with tendencies to respond in certain ways. Some of these inborn biases are shared by virtually all children. For instance, the sequence in which children acquire spoken language—single words precede two-word sentences, and so on—is virtually identical in all children, no matter what language they are learning (Pinker, 2002). Moreover, babies seem to be equipped with a set of behaviors that entice others to care for them, including crying, snuggling, and, very soon after birth, smiling, and they appear to be delighted when their efforts to arouse interest in others are successful.

nature–nurture debate the debate about the relative contributions of biological processes and experiential factors to development

Other inborn biases may vary from one individual to another. Even in the early days of life, for example, some infants are relatively easy to soothe when they become distressed, while others are more difficult to manage. Whether these inborn patterns are coded in the genes, are created by variations in the prenatal environment, or arise through some combination of the

two, the basic point is that a baby is not a blank slate at birth. Babies seem to start life prepared to seek out and react to particular kinds of experiences.

Thinking on the nurture side of the issue is also more complex than in the past. For example, modern developmentalists have accepted the concept of *internal models of experience*. The key element of this concept is the idea that the effect of an experience depends not on its objective properties but rather on the individual's *interpretation*—the meaning that the individual attaches to that experience. For instance, suppose a friend says, "Your new haircut looks great; it's a lot nicer when it's short like that." Your friend intends to pay you a compliment, but you also hear an implied criticism ("Your hair used to look awful"), and your reactions, your feelings, and even your relationship with your friend are affected by how you interpret the comment—not by what your friend meant or by the objective qualities of the remark.

Continuity versus Discontinuity

LO 1.5 What is the continuity–discontinuity debate?

Another key issue in the study of human development is the *continuity–discontinuity* issue. The question is whether age-related change is primarily a matter of amount or degree (the *continuity* side of the debate) or of changes in type or kind (the *discontinuity* side). For example, generally speaking, do you have more or fewer friends than you did when you were in elementary school? If you're like most other people, you have fewer (see Chapter 14). But do age differences in the number of friends people have really capture the difference between friendship in childhood and adulthood? Isn't it also true that friendship itself is different in childhood and adulthood? For example, mutual trust is a characteristic of adult and teen friendships but is not a feature of friendship prior to age 10 or so (see Chapter 10). Thus, the continuous aspect of friendship is that people of all ages have peer relationships, and the discontinuous aspect of friendship is that the characteristics of friendship itself vary by age.

Another way of approaching the continuity–discontinuity question is to think of it in terms of *quantitative* and *qualitative* change. A **quantitative change** is a change in amount. For instance, children get taller as they get older. Their heights increase, but the variable of height itself never changes. In other words, height changes continuously; it has continuity from one age to the next. Alternatively, a **qualitative change** is a change in characteristic, kind, or type. For example, puberty is a qualitative change. Prior to puberty, humans are incapable of reproduction. After puberty, they can reproduce. Therefore, postpubescent humans possess a characteristic that prepubescent humans do not: the capacity to reproduce. In other words, postpubescent and prepubescent humans are qualitatively different, and changes in the capacity to reproduce are discontinuous in nature. Later in life, another qualitative change in reproductive capacity occurs when women go through menopause and lose the capacity for reproduction.

Of particular significance to developmental theories is the idea that, if development consists only of additions (continuous, quantitative change), then the concept of **stages**—qualitatively distinct periods of development—is not needed to explain it. However, if development involves reorganization or the emergence of wholly new strategies, qualities, or skills (discontinuous, qualitative change), then the concept of stages may be useful. As you'll learn in Chapter 2, an important difference among theories of development is whether they assume that development occurs in stages or is primarily continuous in nature.

Three Kinds of Change

LO 1.6 How do the three kinds of age-related change differ?

Have you ever thought about the difference between taking your first steps and your first date? Clearly, both are related to age, but they represent fundamentally different kinds of change. Generally, developmental scientists think of each age-related change as representing one of three categories.

Normative age-graded changes are universal—that is, they are common to every individual in a species and are linked to specific ages. Some universal changes (like a baby's first step) happen because we are all biological organisms subject to a genetically programmed maturing

quantitative change a change in amount

qualitative change a change in kind or type

stages qualitatively distinct periods of development

normative age-graded changes changes that are common to every member of a species

The biological clock obviously constrains the social clock to some extent at least. Virtually every culture emphasizes family formation in early adulthood because that is, in fact, the optimal biological time for child rearing.

process. The infant who shifts from crawling to walking and the older adult whose skin becomes progressively more wrinkled are following a plan that is an intrinsic part of the physical body, most likely something in the genetic code itself.

However, some changes are universal because of shared experiences. A social clock also shapes all (or most) lives into shared patterns of change (Helson, Mitchell, & Moane, 1984). In each culture, the **social clock**, or *age norms*, defines a sequence of "normal" life experiences, such as the right time to go out on a first date, the appropriate timing of marriage and childbearing, and the expected time of retirement.

Age norms can lead to **ageism**—prejudicial attitudes about older adults, analogous to sexism or racism (Iverson, Larsen, & Solem, 2009). In U.S. culture, for example, older adults are very often perceived as incompetent. Many are denied opportunities to work because employers believe that they are incapable of carrying out required job functions. Thus, social expectations about the appropriate age for retirement work together with ageism to shape individual lives, resulting in a pattern in which most people retire or significantly reduce their working hours in later adulthood.

Equally important as a source of variation in life experience are historical forces, which affect each generation somewhat differently. Such changes are called **normative history-graded changes**. Social scientists use the word *cohort* to describe a group of individuals who are born within some fairly narrow span of years and thus share the same historical experiences at the same times in their lives. Within any given culture, successive cohorts may have quite different life experiences (see the *Research Report*).

Finally, **nonnormative changes** result from unique, unshared events. One clearly unshared event in each person's life is conception; the combination of genes each individual receives at conception is unique. Thus, genetic differences—including physical characteristics such as body type and hair color as well as genetic disorders—represent one category of individual differences. Characteristics influenced by both heredity and environment, such as intelligence and personality, constitute another class of individual differences.

Other individual differences result from the timing of a developmental event. Child-development theorists have adopted the concept of a **critical period**—the idea is that there may be specific periods in development when an organism is especially sensitive to the presence (or absence) of some particular kind of experience.

Most knowledge about critical periods comes from animal research. For baby ducks, for instance, the first 15 hours or so after hatching is a critical period for the development of a following response. Newly hatched ducklings will follow any duck or any other moving object that happens to be around them at that critical time. If nothing is moving at that critical point, they don't develop any following response at all (Hess, 1972).

The broader concept of a sensitive period is more common in the study of human development. A **sensitive period** is a span of months or years during which a child may be particularly responsive to specific forms of experience or particularly influenced by their absence. For example, the period from 6 to 12 months of age may be a sensitive period for the formation of parent–infant attachment.

In studies of adults, an important concept related to timing has been that of on-time and off-time events (Neugarten, 1979). The idea is that experiences occurring at the expected times for an individual's culture or cohort will pose fewer difficulties for the individual than will off-time experiences. Thus, being widowed at 30 is more likely to produce serious life disruption and distress than would being widowed at 70.

social clock a set of age norms defining a sequence of life experiences that is considered normal in a given culture and that all individuals in that culture are expected to follow

ageism prejudicial attitudes about older adults that characterizes them in negative ways

normative history-graded changes changes that occur in most members of a cohort as a result of factors at work during a specific, well-defined historical period

nonnormative changes changes that result from unique, unshared events

critical period a specific period in development when an organism is especially sensitive to the presence (or absence) of some particular kind of experience

sensitive period a span of months or years during which a child may be particularly responsive to specific forms of experience or particularly influenced by their absence

RESEARCH REPORT

An Example of a Cohort Effect: Children and Adolescents in the Great Depression

Research involving children and adolescents who grew up during the Great Depression of the 1930s illustrates that the same historical event can have different effects on adjacent cohorts (Elder, 1974; 1978; Elder, Liker, & Cross, 1984). In a classic study of cohort differences, Glen Elder and his colleagues used several hundred participants who were born either in 1920 or in 1928 and who also were participants in the Berkeley/Oakland Growth Study, a long-term study of groups of participants from childhood through late adulthood. Those in the 1920 group were in their teens during the Depression; those born in 1928 were still young children during the worst economic times.

In each cohort, researchers compared participants whose families had lost more than 35% of their pre-Depression income with those whose economic condition was better. They found that economic hardship was largely beneficial to the cohort born in 1920, who were teenagers when the Depression struck full force, while it was generally detrimental to the cohort born in 1928. Most of those in the older cohort whose families experienced the worst economic hardship were pushed into assuming adult responsibilities prematurely. Many worked at odd jobs, earning money that was vitally important to the family's welfare. They felt needed by their families, and as adults, they had a strong work ethic and commitment to family.

Those who were born in 1928 had a very different Depression experience. Their families frequently suffered a loss of cohesion and warmth. The consequences were generally negative for the children, especially the boys. They were less hopeful and less confident than their less economically stressed peers; in adolescence, they did less well in school and completed fewer years of education; as adults, they were less ambitious and less successful.

CRITICAL ANALYSIS

1. ***In what ways do these findings illustrate the concepts of vulnerability and resilience that you will read about below?***
2. ***Individuals who were born in 1985 were in high school when the terrorist attacks of September 11, 2001, occurred. Those who were born a decade later, in 1995, were in the early elementary grades. Individuals in both cohorts probably remember the events, but, because they experienced them during different periods of development, the two groups might have been affected differently. What kinds of differences do you think might be found in these two groups' long-term reactions to the events of September 11, 2001?***

Atypical development is another kind of individual change. **Atypical development** (also known as *abnormal behavior*, *psychopathology*, or *maladaptive development*) refers to deviation from a typical, or "normal," developmental pathway in a direction that is harmful to an individual. Examples of atypical development include intellectual disability, mental illness, and behavioral problems such as extreme aggressiveness in children and compulsive gambling in adults.

Contexts of Development

LO 1.7 How does consideration of the contexts in which change occurs improve scientists' understanding of human development?

To fully understand human development, we must understand the context in which it occurs. For instance, a child grows up in a number of separate, but related, contexts: her neighborhood and school, the occupations of her parents and their level of satisfaction in these occupations, her parents' relationships with each other and their own families, and so on.

A good example of research that examines such a larger system of influences is Gerald Patterson's work on the origins of delinquency (Granic & Patterson, 2006). His studies show that parents who use poor discipline techniques and poor monitoring are more likely to have noncompliant children. Once established, such a behavior pattern has repercussions in other areas of the child's life, leading to both rejection by peers and difficulty in school. These problems, in turn, are likely to push the young person toward delinquency (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Vuchinich, Bank, & Patterson, 1992). So a pattern that began in the family is maintained and made worse by interactions with peers and with the school system.

However, we have to keep in mind that all the various contexts interact with each other and with the characteristics of the individuals who are developing within them. Along these lines, some developmentalists have found the concepts of *vulnerability* and *resilience* to be useful (Bowman, 2013). According to this view, each child is born with certain vulnerabilities, such as a tendency toward emotional irritability or alcoholism, a physical abnormality, an allergy, or whatever. Each child is also born with some protective factors, such as high intelligence, good physical coordination, an easy temperament, or a lovely smile, that tend to make her more resilient in the face of stress. These vulnerabilities and protective factors then interact with the child's environment, so the

atypical development development that deviates from the typical developmental pathway in a direction that is harmful to the individual

The settings in which children grow up and adults age contribute to the developmental process. How do you think these older adults' experiences differ from those of people their age who live in industrialized cultures?

same environment can have quite different effects, depending on the qualities the child brings to the interaction.

The combination of a highly vulnerable child and a poor or unsupportive environment produces by far the most negative outcomes (Horowitz, 1990). Either of these two negative conditions alone—a vulnerable child or a poor environment—can be overcome. A resilient child in a poor environment may do quite well, since she can find and take advantage of all the stimulation and opportunities available; similarly, a vulnerable child may do quite well in a highly supportive environment in which parents help the child overcome or cope with her vulnerabilities. The "double whammy"—being a vulnerable child in a poor environment—leads to really poor outcomes for the child. The characteristics of the larger society in which a child's family and neighborhood are embedded matter as well. The term *culture* has no commonly agreed-on definition, but in essence it describes some system of meanings and customs, including values, attitudes, goals, laws, beliefs, moral guidelines, and physical artifacts of various kinds, such as tools, forms of dwellings, and the like. Furthermore, to be called a culture, a system of meanings and customs must be shared by some identifiable group, whether that group is a subsection of some population or a larger unit, and must be transmitted from one generation of that group to the next (Betancourt & Lopez, 1993; Cole, 1992). Culture shapes not only the development of individuals but also ideas about what normal development is.

For example, researchers interested in middle and late adulthood often study retirement: why people retire, how retirement affects their health, and so on. But their findings do not apply to older adults in nonindustrialized cultures, where adults gradually shift from one kind of work to another as they get older rather than give up work altogether and enter a new phase of life called "retirement." Consequently, developmentalists must be aware that retirement-related phenomena do not constitute universal changes. Instead, they represent developmental experiences that are culturally specific.

One final aspect of the context within which an individual's development occurs involves gender. Two individuals can be quite similar with regard to their individual characteristics and the environment within which they grow up. However, if one is female and the other male, they will experience the interaction between their characteristics and their environment differently. As you will learn in a Chapter 11, for example, the effects of the earliness or lateness with which a child goes through puberty depend on gender. Thus, early and late puberty have different meanings for boys and girls.

test yourself before going on

Answers to these questions can be found in the back of the book.

1. Aspects of infants' appearance that motivate adults to care for them are examples of a(n) _____ _____.
2. Developmental stages are often a feature in the theories of developmentalists who emphasize _____ changes.
3. Give an example from the text of each type of change in the chart below:

Type of Change	Example
Normative age-graded	
Normative history-graded	
Nonnormative	

4. (Critical/sensitive) periods are more common in animal research than in studies with humans.
5. What is the "double whammy" described in the text?

CRITICAL THINKING

6. How do your culture's behavioral expectations for 20-year-olds, 40-year-olds, and 60-year-olds differ?

Research Methods and Designs

The easiest way to understand research methods is to look at a specific question and the alternative ways we might answer it. For example, older adults frequently complain that they have more trouble remembering people's names than they did when they were younger. Suppose we wanted to find out whether memory really declines with age. How would we go about answering this question?

The Goals of Developmental Science

LO 1.8 What are the goals of scientists who study human development?

Researchers who study human development use the scientific method to achieve four goals: to describe, to explain, to predict, and to influence human development from conception to death. To *describe* development is simply to state what happens. In attempting to describe human development, for example, we might make a descriptive statement such as "Older adults make more memory errors than young and middle-aged adults." To test whether this statement meets its descriptive goal, we could simply measure memory function in adults of various ages.

Explaining development involves telling why a particular event occurs. To generate explanations, developmentalists rely on *theories*—sets of statements that propose general principles of development. Students often say that they hate reading about theories; they just want the facts. However, theories are important because they help us look at facts from different perspectives. For example, "Older adults make more memory mistakes because of changes in the brain that happen as people get older" is a statement that attempts to explain the fact of age-related memory decline from a biological perspective. Alternatively, we could explain memory decline from an experiential perspective and hypothesize that memory function declines with age because older adults don't get as much memory practice as younger adults do.

Useful theories produce *predictions* or *hypotheses*, that researchers can test, such as "If changes in the brain cause declines in memory function, then elderly adults whose brains show the most change should also make the greatest number of memory errors." To test this hypothesis, we would have to measure some aspects of brain structure or function as well as memory function. Then we would have to find a way to relate one to the other. Alternatively, we could test the experiential explanation by comparing the memories of older adults who presumably get the most memory practice, such as those who are still working, to the memories of those who get less practice. If the working adults do better on tests of memory, the experiential perspective gains support. Moreover, if both the biological and the experiential hypotheses are supported by research, we have far more insight into age-related memory decline than we would have from either kind of hypothesis alone. In this way, theories add tremendous depth to psychologists' understanding of the facts of human development and provide them with information they can use to influence development.

Finally, developmental scientists hope to use their findings to *influence* developmental outcomes. Let's say, for example, that an older adult is diagnosed with a condition that can affect the brain, such as a stroke. If we know that brain function and memory are related, we can use tests of memory to make judgments about how much the stroke has damaged the patient's brain. In addition, because developmental scientists know that experience affects memory, they can design training programs that occupational therapists can implement to help the patient recover memory functions that have been impaired by the stroke (see *No Easy Answers* on page 34).

Descriptive Methods

LO 1.9 What descriptive methods do developmental scientists use?

A researcher who is interested in age and memory ability must decide how to go about finding relationships between variables. To developmentalists, *variables* are characteristics that vary from person to person, such as physical size, intelligence, and personality. When two or more variables vary together, there is some kind of relationship between them. The hypothesis that

NO EASY ANSWERS

It Depends . . .

One of the most important things you can learn about research is that the answers to many of the practical questions people ask about development begin with "It depends." For example, when a parent discovers her son has been molested by a neighbor, she wants to know how the abuse will affect him in the future. But developmental psychologists don't have a concrete answer. They can tell the mother that the overwhelming majority of traumatized children show no long-term effects. They can also analyze the child and his particular situation and make an educated guess about what might happen in the future. In other words, the long-term outcomes depend on a variety of variables: how long the abuse lasted, at what age it began, the child's personality, the way the parents handled the situation when they learned of the abuse, and so on.

To further complicate matters, all the relevant variables interact with one another. For example, counseling might benefit an outgoing child but might be ineffective for a shy child who tends to keep his feelings to himself. Conversely, art therapy, a strategy that encourages children to express their feelings in drawings, might be effective with a shy child but have little impact on one who is outgoing. Because of such complexities, developmentalists can't tell the mother what she wants to hear: that if she follows a certain formula, her child will turn out fine.

YOU DECIDE

Decide which of these two statements you most agree with and think about how you would defend your position:

1. ***Relevant research findings should be the most important factor in the formation of social policies.***
2. ***Research findings represent only one of several sources of information that ought to be considered in the formation of social policies.***

naturalistic observation the process of studying people in their normal environments

case study an in-depth examination of a single individual

laboratory observation observation of behavior under controlled conditions

memory declines with age involves two variables—memory and age—and suggests a relationship between them. There are several ways of identifying such relationships.

NATURALISTIC OBSERVATION When psychologists use **naturalistic observation** as a research method, they observe people in their normal environments. For instance, to find out more about memory in older adults, a researcher could observe older adults in their homes or workplaces. Such studies provide developmentalists with information about psychological processes in everyday contexts.

The weakness of naturalistic observation, however, is *observer bias*. For example, if the researcher who is observing older adults is convinced that most of them have poor memories, he is likely to ignore any behavior that goes against this view. Because of observer bias, naturalistic observation studies often use "blind" observers who don't know what the research is about. In most cases, for the sake of accuracy, researchers use two or more observers so that the observations of each observer can be checked against those of the other(s).

Naturalistic observation studies are limited in the extent to which the results can be generalized. In addition, naturalistic observation studies are very time-consuming. They must be repeated in a variety of settings so that researchers can be sure people's behavior reflects development and not the influences of a specific environment.

CASE STUDIES A **case study** is an in-depth examination of a single individual. To test the hypothesis about memory and age, we could use a case study comparing one individual's scores on tests of memory in early and late adulthood. Such a study might tell us a lot about the stability or instability of memory in the individual studied, but we wouldn't know if our findings applied to others.

Still, case studies are extremely useful in making decisions about individuals. For example, to find out whether a child has an intellectual disability, a psychologist would conduct an extensive case study involving tests, interviews of the child's parents, behavioral observations, and so on. Case studies are also frequently the basis of important hypotheses about unusual developmental events, such as head injuries and strokes.

Psychologists who conduct case studies gather detailed information about a single individual. Their data often include the results of psychological tests.

LABORATORY OBSERVATION **Laboratory observation** differs from naturalistic observation in that the researcher exerts some degree of control over the environment. Suppose, for instance, that you volunteer to participate in a study in which you will have to take a computerized intelligence

test. You go to the computer laboratory where the study will take place, and a researcher carrying a folder marked "Test Key" sits down with you in front of a computer. As she begins to explain the test's instructions, another person comes to the door and tells her that she must go to another room to take an important phone call. In her haste to leave, the researcher leaves the folder on the table next to the computer. A hidden video camera records your behavior while you are out of the room. (Do you think you would peek?) When the researcher returns, you complete the test that you believed was the purpose of the study. Later, the researcher and her colleagues will analyze the tapes of participants' responses in order to determine the frequency with which cheating occurs under such conditions. (Research ethics also requires that they inform you of the deceptive aspects of their study, as you will learn later.) As you can see, observing cheating behavior under controlled conditions offers many advantages over trying to identify and track it in an actual classroom.

SURVEYS

Have you ever been questioned about which brand of soda you prefer or which candidate you plan to vote for in the next election? If so, then you have participated in a **survey**, a study in which researchers use interviews and/or questionnaires to collect data about attitudes, interests, values, and various kinds of behaviors. Surveys allow researchers to quickly gather information. They can also be used to track changes over time.

The value of any survey depends entirely on how representative the *sample* of participants is of the researcher's *population* of interest. A **population** is the entire group about which the researcher is attempting to learn something; a **sample** is a subset of that group. Thus, when voters are asked which candidate they prefer, the population of interest is all the people who will vote in the election. The sample includes only the people who are actually questioned by the researchers. If the sample is not a **representative sample**—that is, if it does not include the same proportions of males, females, Democrats, Republicans, and so forth, as the actual voting population does—then the survey's results will be inaccurate. Moreover, survey participants are sometimes influenced by the perceived *social desirability* of their answers. If they think that they should answer a question in a certain way to please the researchers, then they may not give truthful answers. Thus, whenever you hear a news report about a survey, you should remember that to judge whether the survey is valid, you need to know something about how the sample of participants was recruited and how the questions were asked.

CORRELATIONS

A **correlation** is a relationship between two variables that can be expressed as a number ranging from −1.00 to +1.00. A zero correlation indicates that there is no relationship between the two variables. A positive correlation means that high scores on one variable are usually accompanied by high scores on the other. The closer a positive correlation is to +1.00, the stronger the relationship between the variables. Two variables that change in opposite directions have a negative correlation, and the nearer the correlation is to −1.00, the more strongly the two are connected.

To understand positive and negative correlations, think about the relationship between temperature and the use of air conditioners and heaters. Temperature and air conditioner use are positively correlated. As the temperature climbs, the number of air conditioners in use goes up. Conversely, temperature and heater use are negatively correlated. As the temperature decreases, the number of heaters in use goes up.

If we wanted to know whether age is related to memory, we could use a correlation. We would need to administer memory tests to adults of varying ages and calculate the correlation between test scores and ages. If we found a positive correlation between age and the number of memory errors people made—if older people made more errors—then we could say that our hypothesis had been supported. Conversely, if we found a negative correlation—if older people made fewer errors—then we would have to conclude that our hypothesis had not been supported.

Useful as they are, though, correlations have a major limitation: They do not indicate *causal* relationships. For example, even a high positive correlation between memory errors and age would tell us only that memory performance and age are connected in some way. It wouldn't tell us what caused the connection. It might be that younger adults understand the test instructions better. In order to identify a cause, we have to carry out experiments (see *Developmental Science at Home* on page 36). **Explore** the **Concept** *Correlations Do Not Show Causation* in **MyPsychLab**.

survey a data-collection method in which participants respond to questions

population the entire group that is of interest to a researcher

sample a subset of a group that is of interest to a researcher who participates in a study

representative sample a sample that has the same characteristics as the population to which a study's findings apply

correlation a relationship between two variables that can be expressed as a number ranging from −1.00 to +1.00

DEVELOPMENTAL SCIENCE AT HOME

Correlation versus Causation

Three-year-old Mina loves to play with the other children at her day-care center and can't wait to get to "school" each morning. But her mother, Christina, is worried about reports that she has heard on the news about the possible harmful effects of day care on children's development. Like most other parents, Christina wants what is best for her child, but she also needs to work. She wonders how to find a balance between Mina's need for quality time with Mom and her family's economic needs.

When research results are at variance with our personal values or with the decisions we have made about our lives, many of us respond by saying either "I agree with that study" or "I don't agree with that study." A better approach is to learn to use knowledge of research methods to become a "critical consumer" of research. For example, suppose Christina is a friend of yours and, knowing that you are taking a course in child development, she asks you for advice regarding the news report about which she is concerned. After reading this chapter, you should know that only an experiment can produce such proof. To demonstrate that day care causes behavior problems, researchers would have to randomly assign infants to day-care and home-care groups. You should be aware that such a study would be unethical and, therefore, impossible. Thus, a newspaper report may claim that a study showing a correlation between day care and behavior problems demonstrates that one causes the other—but you, the critical consumer, should know better. Once you make Christina aware of the scientific merits of the study, she can move forward with balancing such findings with her own values and priorities to make decisions about how she wants to raise her children.

REFLECTION

1. ***How would you apply the ideas in this discussion to interpreting a news report about a study "proving" that being raised by a single parent is harmful to young children?***
2. ***If such a study were reported, what variables other than single parenthood itself might explain the results?***

The Experimental Method

LO 1.10 What is the primary advantage of the experimental method?

An **experiment** is a study that tests a causal hypothesis. Suppose, for example, that we think age differences in memory are caused by older adults' failure to use memory techniques, such as repeating a list mentally in order to remember it. We could test this hypothesis by providing memory-technique training to one group of older adults and no training to another group. If the trained adults got higher scores on memory tests than they did before training and the no-training group showed no change, we could claim support for our hypothesis.

A key feature of an experiment is that participants are assigned *randomly* to one of two or more groups. In other words, chance determines which group each participant is placed in. The groups then have equal amounts of variation with respect to characteristics such as intelligence, personality traits, height, weight, and health status. Consequently, none of these variables can affect the outcome of the experiment.

Participants in the **experimental group** receive the treatment the experimenter thinks will produce a particular effect, while those in the **control group** receive either no special treatment or a neutral treatment. The presumed causal element in the experiment is called the **independent variable**, and the characteristic or behavior that the independent variable is expected to affect is called the **dependent variable**. **Simulate** the **Experiment** *Distinguishing Independent and Dependent Variables* in **MyPsychLab**.

In a memory-technique training experiment like the one suggested above, the group that receives the memory training is the experimental group, and the one that receives no instruction is the control group. Memory-technique training is the variable that we, the experimenters, think will cause differences in memory function, so it is the independent variable. Performance on memory tests is the variable we are using to measure the effect of the memory technique training. Therefore, performance on memory tests is the dependent variable.

Experiments are essential for understanding many aspects of development. But two special problems in studying child or adult development limit the use of experiments. First, many of the questions researchers want to answer have to do with the effects of particular unpleasant or stressful experiences on individuals—abuse, prenatal influences of alcohol or tobacco, low birth weight, poverty, unemployment, widowhood. For obvious ethical reasons, researchers cannot manipulate these variables. For example, they cannot ask one set of pregnant women to have two alcoholic drinks a day and others to have none. To study the effects of such experiences, they must rely on nonexperimental methods, such as correlations.

experiment a study that tests a causal hypothesis

experimental group the group in an experiment that receives the treatment the experimenter thinks will produce a particular effect

control group the group in an experiment that receives either no special treatment or a neutral treatment

independent variable the presumed causal element in an experiment

dependent variable the characteristic or behavior that is expected to be affected by the independent variable

Second, the independent variable that developmentalists are often most interested in is age itself, and researchers cannot assign participants randomly to age groups. They can compare 4-year-olds and 6-year-olds in their approach to some particular task, such as searching for a lost object, but the children differ in a host of ways other than their ages. Older children have had more and different experiences. Thus, unlike psychologists studying other aspects of behavior, developmental psychologists cannot systematically manipulate many of the variables they are most interested in.

To get around this problem, researchers can use any one of a series of strategies, sometimes called *quasi-experiments*, in which they compare groups without assigning the participants randomly. Quasi-experiments are studies in which researchers compare members of naturally occurring groups that differ in some dimension of interest, such as children whose parents choose to place them in day-care programs and children whose parents keep them at home. Such comparisons have built-in problems because groups that differ in one way are likely to differ in other ways as well. Compared with parents who keep their children at home, parents who place their children in day care are generally poorer, are more likely to be single parents, and tend to have different values or religious backgrounds. If researchers find that the two groups of children differ in some fashion, is it because they have spent their days in different environments or because of these other differences in their families? Researchers can make such comparisons a bit easier if they select comparison groups that are matched on those variables the researchers think might matter, such as income, marital status, or religion. But a quasi-experiment, by its very nature, will always yield more ambiguous results than will a fully controlled experiment.

Designs for Studying Age-Related Changes

LO 1.11 What are the pros and cons of cross-sectional, longitudinal, and sequential research designs?

In addition to deciding which method to use, developmental scientists must also determine how to incorporate age into their research design. There are three general strategies for doing so: (1) study different groups of people of different ages, using a **cross-sectional design**; (2) study the same people over a period of time, using a **longitudinal design**; (3) combine cross-sectional and longitudinal designs in some fashion, in a **sequential design**.

CROSS-SECTIONAL DESIGNS Figure 1.1 is a good example of a cross-sectional study in which researchers examined age differences in people's ability to recognize facial expressions. As you can see, younger adults outperformed those who were older in identifying anger. If these findings fit the researchers' hypothesis, they might be tempted to conclude that the ability to identify anger in facial expressions declines with age. But we cannot say this conclusively based on the cross-sectional data because these adults differ in both age and cohort. Thus, the age differences in this study might reflect, for example, differences in education and not changes linked to age or development. Influences of this kind lead to **cohort effects**, findings that result from historical factors to which one age group in a cross-sectional study has been exposed.

Furthermore, cross-sectional studies cannot tell us anything about sequences of change with age or about the consistency of individual behavior over time because each participant is tested only once. Still, cross-sectional research is very useful because it can be done relatively quickly and can reveal possible age differences or age changes.

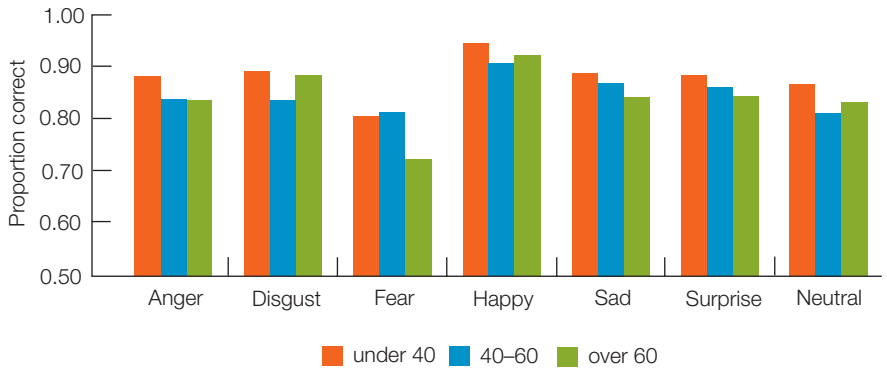


Figure 1.1 An Example of a Cross-Sectional Design

In this cross-sectional study, researchers compared the ability to recognize various kinds of facial expressions across young adult, middle-aged adult, and older adult groups. This study is cross-sectional because it measured the same variable at the same time in people of different ages.

(*Source:* Figure 1, "Age Differences in Recognition of Emotion in Lexical Stimuli and Facial Expressions," by Derek M. Isaacowitz et al., from *Psychology and Aging*, Vol. 22 (1), pp. 147–159, Mar. 2007, American Psychological Association. Reprinted by permission.)

cross-sectional design a research design in which groups of people of different ages are compared

longitudinal design a research design in which people in a single group are studied at different times in their lives

sequential design a research design that combines cross-sectional and longitudinal examinations of development

cohort effects findings that result from historical factors to which one age group in a cross-sectional study has been exposed

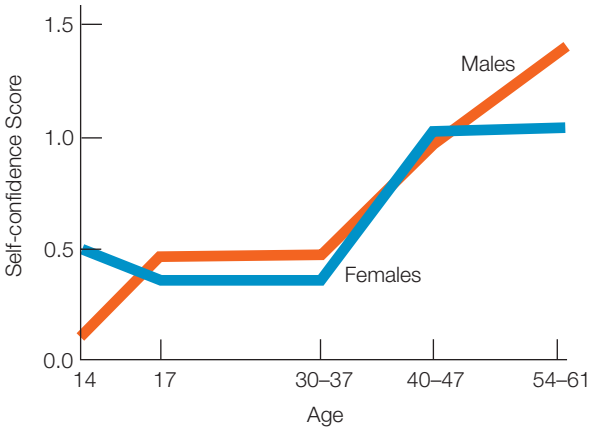


Figure 1.2 An Example of a Longitudinal Design

These results are from a classic study in Berkeley and Oakland, California, of a group of participants born either in 1920 or in 1928. They were tested frequently in childhood and adolescence, as well as three times in adulthood. Here you can see the sharp rise in self-confidence that occurred for both men and women in this group in their 30s—a pattern that may reflect a shared personality change, triggered by the common experiences of the social clock.

(*Source:* Adapted from Figures 1 and 2, p. 228, "As Time Goes By: Change and Stability in Personality Over Fifty Years," from *Psychology and Aging*, 1 (3), pp. 220–232, Haan, N. et al. Copyright © 1986 by the American Psychological Association. Adapted by permission.)

LONGITUDINAL DESIGNS Longitudinal designs seem to solve the problems presented by cross-sectional designs because they follow the same individuals over a period of time. Such studies allow psychologists to look at sequences of change and at individual consistency or inconsistency over time. And because longitudinal studies compare performance by the same people at different ages, they get around the obvious cohort problem.

A few well-known longitudinal studies have followed groups of children into adulthood or groups of adults from early to late adult life. One of the most famous of these is the Berkeley/Oakland Growth Study (see Figure 1.2) (Eichorn, Clausen, Haan, Honzik, & Mussen, 1981). Perhaps equally famous is the Grant study of Harvard men (Vaillant, 1977). This study followed several hundred men from age 18 until they were in their 60s. Such studies are extremely important in the study of human development, and you'll be reading more about them in later chapters.

Despite their importance, longitudinal designs have several major difficulties. One is that they typically involve giving each participant the same tests again and again. Over time, people learn how to take the tests. Such *practice effects* may distort the measurement of any underlying developmental changes.

Another significant problem is that some participants drop out, die, or move away. As a general rule, the healthiest and best educated participants are most likely to stick it out, and that fact biases the results, particularly if the study covers the final decades of life. Each succeeding set of test results comes from proportionately more and more healthy adults, which may give the appearance of less change or less decline than actually exists.

Longitudinal studies also don't really get around the cohort problem. For example, both the Grant study and the Berkeley/Oakland Growth Study observed and tested participants born in the same decade (1918–1928). Even if both studies showed the same pattern of change with age, we wouldn't know whether the pattern was unique to that cohort or reflected more basic developmental changes that would be observed in other cultures and other cohorts.

SEQUENTIAL DESIGNS One way to avoid the shortcomings of both cross-sectional and longitudinal designs is to use a sequential design. One group might include 25- to 30-year-olds and the other 30- to 35-year-olds. We would then test each group several times over a number of years. In a sequential study, each testing point beyond the initial one allows researchers to make two types of comparisons. Age-group comparisons provide them with the same kind of information as a cross-sectional study. Comparison of each group to itself at an earlier testing point allows the researchers to collect longitudinal evidence at the same time.

Sequential designs also allow for comparisons of cohorts. If both groups demonstrate similar age-related patterns of change over time, researchers can conclude that the developmental pattern is not specific to any particular cohort. Finding the same developmental pattern in two cohorts provides psychologists with stronger evidence than either cross-sectional or longitudinal data alone. For example, Figure 1.3 illustrates a sequential study in which Baby Boomer

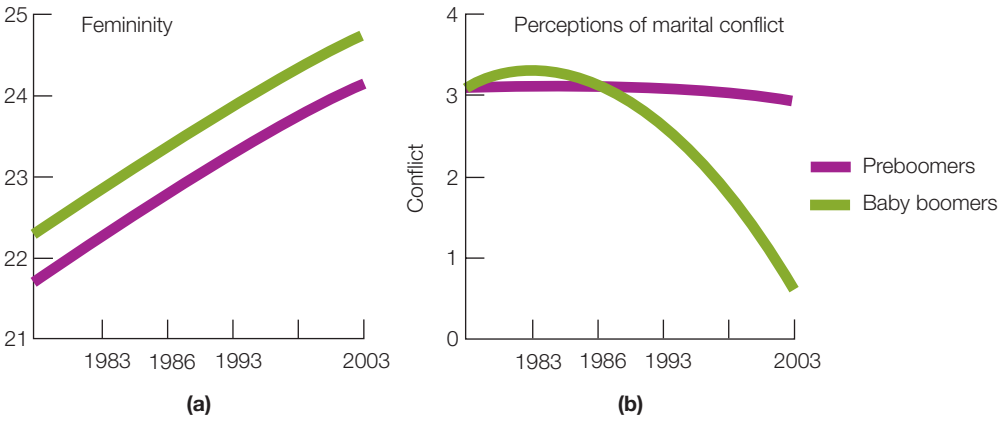


Figure 1.3 An Example of a Cross-Sequential Design

These findings illustrate the strengths of the cross-sequential design. Researchers tested more than 700 women in 1983, 1986, 1993, and 2003. Among the 700 were some women who were born during the "Baby Boom" (1946 to 1964) and some who were born earlier ("Preboomers"). Panel (a) shows that the tendency of women in both cohorts to describe themselves as "feminine" increased across all four testing points, but (b) shows that women's perceptions of conflict within their marriages remained stable across age for Preboomers but declined dramatically among Baby Boomers.

(*Source:* Adapted from Figure 1a, p. 950, Figure 6b, p. 953, from "Social Role and Birth Cohort Influences on Gender-Linked Personality Traits in Women: A 20-Year Longitudinal Analysis," by S. Kasen, et al., *Journal of Personality and Social Psychology*, 91 (5), Nov. 2006, pp. 944–958. Copyright © 2006 by the American Psychological Association. Adapted by permission.)

women who were born between 1946 and 1964 were compared to women born during the 1930s and early 1940s. Across four testing points, the two groups' self-perceptions of femininity increased in parallel fashion, suggesting a true developmental change. By contrast, the relationship between age and reported frequency of marital conflict was different in each cohort, a finding which suggests that historical factors may have caused the two groups to vary in either actual marital conflict or in their perceptions of what constitutes conflict.

ethnography a detailed description of a single culture or context

research ethics the guidelines researchers follow to protect the rights of animals used in research and humans who participate in studies

Cross-Cultural Research

LO 1.12 Why is cross-cultural research important to the study of human development?

Increasingly common in human development are studies comparing cultures or contexts, a task that researchers approach in several ways. For example, an **ethnography** is a detailed description of a single culture or context, based on extensive observation. Often the observer lives in the culture or context for a period of time, perhaps as long as several years. Each ethnographic study is intended to stand alone, although sometimes we can combine information from several different studies to see whether similar developmental patterns exist in the various cultures or contexts.

Alternatively, investigators may attempt to compare two or more cultures directly, by testing children or adults in each of the cultures with the same or comparable measures. Sometimes this involves comparing groups from different countries. Sometimes the comparisons are between subcultures within the same country; for example, increasingly common in the United States is research involving comparisons of children or adults living in different ethnic groups or communities, such as African Americans, Hispanic Americans, Asian Americans, and European Americans.

Ethnographers often interact in everyday settings with members of the cultures they study.

Cross-cultural research is important to the study of human development for two reasons. First, developmentalists want to identify universal changes—that is, predictable events or processes experienced by individuals in all cultures. Developmentalists don't want to make a general statement about development—such as "Memory declines with age"—if the phenomenon in question happens only in certain cultures. Without cross-cultural research, it is impossible to know whether studies involving North Americans and Europeans apply to people in other parts of the world.

Second, one of the goals of developmentalists is to produce findings that can be used to improve people's lives. Cross-cultural research is critical to this goal as well. For example, developmentalists know that children in cultures that emphasize the community more than the individual are more cooperative than children in more individualistic cultures. However, to use this information to help all children learn to cooperate, they need to know exactly how adults in such cultures teach their children to be cooperative. Cross-cultural research helps developmentalists identify specific variables that explain cultural differences. See Table 1.1 (page 40) for a comparison of various research methods and designs.

Research Ethics

LO 1.13 What are the ethical standards that developmental researchers must follow?

Research ethics are the guidelines researchers follow to protect the rights of animals used in research and humans who participate in studies. Ethical guidelines are published by professional organizations such as the American Psychological Association, the American Educational Research Association, and the Society for Research in Child Development. Universities, private foundations, and government agencies have review committees that make sure all research the institution sponsors is ethical. Guidelines for animal research include the requirement that animals be protected from unnecessary pain and suffering. Further, researchers must demonstrate that the potential benefits of their studies to either human or animal populations will be greater than any potential harm to animal subjects. **Simulate** the **Experiment** *Ethics in Psychological Research* in **MyPsychLab**.

TABLE 1.1 Research Methods and Designs

Method	Description	Advantages	Limitations
Naturalistic observation	Observation of behavior in natural settings	Participants behave naturally	Researchers' expectations can influence results; little control over conditions
Case studies	In-depth study of one or a few individuals using observation, interviews, or psychological testing	In-depth information; important in the study of unusual events	Results may not generalize beyond the case that is studied; time-consuming; subject to misinterpretation
Surveys	Interviews, questionnaires used to gather information quickly	Accurate information about large groups; track changes	Validity limited by sample representativeness; responses influenced by questions, social desirability
Correlational studies	Determination of mathematical relationship between two variables	Assess strength and direction of relationships	Cannot demonstrate cause and effect
Experiments	Random assignment of participants to control and experimental groups; manipulation of independent (causal) variable	Identification of cause–effect relationships	Results may not generalize to nonresearch settings; many variables cannot be studied in experiments
Cross-sectional designs	Participants of different ages studied at one time	Quick access to data about age differences	Ignores individual differences; cohort effects
Longitudinal designs	Participants in one group studied several times	Track developmental changes in individuals and groups	Time-consuming; findings may apply only to the group that is studied
Sequential designs	Study that combines both longitudinal and cross-sectional components	Cross-sectional and longitudinal data relevant to the same hypothesis	Time-consuming; different attrition rates across groups
Cross-cultural research	Research that either describes culture or includes culture as a variable	Information about universality and culture specificity of age-related changes	Time-consuming; difficult to construct tests and methods that are equally valid in different cultures

Ethical standards for research involving human participants address the following major concerns:

- ***Protection from harm:*** It is unethical to do research that may cause participants permanent physical or psychological harm. Moreover, if the possibility of temporary harm exists, researchers must provide participants with some way of repairing the damage. For example, if the study will remind subjects of unpleasant experiences, such as rape, researchers must provide them with counseling.
- ***Informed consent:*** Researchers must inform participants of any possible harm and have them sign a consent form stating that they are aware of the risks of participating. In order for children to participate in studies, their parents must give permission after the researcher has informed them of possible risks. Children older than 7 must also give their own consent. If the research takes place in a school or day-care center, an administrator representing the institution must consent. In addition, both children and adults have the right to discontinue participation in a study at any time. Researchers are obligated to explain this right to children in language they can understand. **Watch** the **Video** *Before Informed Consent: Robert Guthrie* in **MyPsychLab**.
- ***Confidentiality:*** Participants have the right to confidentiality. Researchers must keep the identities of participants confidential and must report their data in such a way that no particular piece of information can be associated with any specific participant. The exception to confidentiality is when children reveal to researchers that they have been abused in any way by an adult. In most states, all citizens are required to report suspected cases of child abuse.

- ***Knowledge of results:*** Participants, their parents, and the administrators of institutions in which research takes place have a right to a written summary of a study's results.
- ***Deception:*** If deception has been a necessary part of a study, participants have the right to be informed about the deception as soon as the study is over.

test yourself before going on

Study and **Review** in **MyPsychLab**

Answers to these questions can be found in the back of the book.

1. The goals of developmental science are to _____, _____, _____, and _____ age-related changes.
2. Match each research method with its definition.
   - _____(1) Manipulated independent variable
   - _____(2) Behavior observed in controlled settings
   - _____(3) In-depth study of single individual
   - _____(4) Behavior observed in typical settings
   - _____(5) Mathematical relationship between two variables
     - **(a)** Correlation
     - **(b)** Case study
     - **(c)** Experiment
     - **(d)** Laboratory observation
     - **(e)** Naturalistic observation
3. List the advantages and disadvantages of each method of studying age-related change.

Method	Advantages	Disadvantages
Cross-sectional		
Longitudinal		
Sequential		

4. What are two reasons cross-cultural research is important?
   - **(1)** _____
   - **(2)** _____
5. Explain what researchers must do to meet ethical standards in each area listed in the table.

Issue	What Researchers Must Do
Protection from harm	
Informed consent	
Confidentiality	
Knowledge of results	
Deception	

CRITICAL THINKING

6. Researchers have found a positive correlation between a mother's age at the birth of her child and the child's later IQ: Very young mothers have children with lower IQs. How many explanations of this correlation can you think of?
7. Suppose a cross-sectional study of sex-role attitudes reveals that adults between the ages of 20 and 50 have the most egalitarian attitudes, while teenagers and adults over 50 have more traditional attitudes. How might cohort differences influence your interpretation of these results?

SUMMARY

An Introduction to Human Development (pp. 24–28)

LO 1.1 What ideas about development were proposed by early philosophers and scientists?

- The philosophical concepts of original sin, innate goodness, and the blank slate have influenced Western ideas about human development. Darwin studied child development to gain insight into evolution. G. Stanley Hall published the first scientific study of children and introduced the concept of norms.

LO 1.2 What is the lifespan perspective?

- Today's developmentalists recognize that change happens throughout life. The lifespan perspective includes the notions that plasticity exists throughout the lifespan, that information from a variety of disciplines is needed to understand development, and that development occurs in multiple contexts.

LO 1.3 What major domains and periods do developmental scientists use to organize their discussions of the human lifespan?

- Theorists and researchers group age-related changes into three broad categories: the physical, cognitive, and social domains. They also refer to the major periods of development: prenatal, infancy, early childhood, middle childhood, adolescence, early adulthood, middle adulthood, and late adulthood.

Key Issues in the Study of Human Development (pp. 28–32)

LO 1.4 How do developmentalists view the two sides of the nature–nurture debate?

- Historically, developmentalists have debated nature versus nurture, but now they believe that every developmental change is a product of both.

LO 1.5 What is the continuity–discontinuity debate?

- The continuity–discontinuity debate centers on whether change is a matter of amount or degree (continuous, quantitative change) or a matter of type or kind (discontinuous, qualitative change). Some aspects of development, such as height, are continuous and change quantitatively, while others, such as reproductive capacity, are discontinuous and change qualitatively. Developmental theorists who focus on qualitative changes usually propose explanations of psychological development that include stages.

LO 1.6 How do the three kinds of age-related change differ?

- Normative age-graded changes are those that are experienced by all human beings. Normative history-graded changes are common to individuals who have similar cultural and historical experiences. Genetic factors and the timing of experiences are two important causes of nonnormative changes in development.

LO 1.7 How does consideration of the contexts in which change occurs improve scientists' understanding of human development?

- The contexts of development include both individual variables and the settings in which development occurs (e.g., family, neighborhood, culture). Individual traits and contexts interact in complex ways to influence development.

Research Methods and Designs (pp. 33–41)

LO 1.8 What are the goals of scientists who study human development?

- Developmental psychologists use scientific methods to describe, explain, predict, and influence age-related changes and individual differences.

LO 1.9 What descriptive methods do developmental scientists use?

- Case studies and naturalistic observation provide a lot of important information, but it usually isn't generalizable to other individuals or groups. Correlational studies measure relationships between variables. They can be done quickly, and the information they yield is more generalizable than that from case studies or naturalistic observation.

LO 1.10 What is the primary advantage of the experimental method?

- To test causal hypotheses, it is necessary to use experimental designs in which participants are assigned randomly to experimental or control groups.

LO 1.11 What are the pros and cons of cross-sectional, longitudinal, and sequential research designs?

- In cross-sectional studies, separate age groups are each tested once. In longitudinal designs, the same individuals are tested repeatedly over time. Sequential designs combine cross-sectional and longitudinal comparisons.

LO 1.12 Why is cross-cultural research important to the study of human development?

- Cross-cultural research helps developmentalists identify universal factors and cultural variables that affect development.

LO 1.13 What are the ethical standards that developmental researchers must follow?

- Ethical principles governing psychological research include protection from harm, informed consent, confidentiality, knowledge of results, and protection from deception.

KEY TERMS

ageism (p. 30)
atypical development (p. 31)
case study (p. 34)
cognitive domain (p. 27)
cohort effects (p. 37)
control group (p. 36)
correlation (p. 35)
critical period (p. 30)
cross-sectional design (p. 37)
dependent variable (p. 36)
ethnography (p. 39)
experiment (p. 36)
experimental group (p. 36)
human development (p. 24)
independent variable (p. 36)
laboratory observation (p. 34)
lifespan perspective (p. 26)
longitudinal design (p. 37)
maturation (p. 25)
naturalistic observation (p. 34)
nature–nurture debate (p. 28)
nonnormative changes (p. 30)
normative age-graded changes (p. 29)
normative history-graded changes (p. 30)
norm-referenced tests (p. 25)
norms (p. 25)
physical domain (p. 26)
population (p. 35)
qualitative change (p. 29)
quantitative change (p. 29)
representative sample (p. 35)
research ethics (p. 39)
sample (p. 35)
sensitive period (p. 30)
sequential design (p. 37)
social clock (p. 30)
social domain (p. 27)
stages (p. 29)
survey (p. 35)

CHAPTER TEST

Study and Review in MyPsychLab

Answers to all the Chapter Test questions can be found in the back of the book.

1. The adoption of the lifespan perspective shows that a key element is the capacity of all individuals of all ages to show positive change in response to environmental demands. This is known as _____.
   a. maturation **c.** innateness
   b. plasticity **d.** expectancy

2. The period of development that begins at conception and ends at birth is _____.
   a. pregnancy **c.** prenatal period
   b. fetus **d.** infancy

3. In an experiment, what do we call the group of participants who receive no treatment?
   a. Experimental group **c.** Independent variable
   b. Control group **d.** Dependent variable

4. Children get taller as they get older. This is an example of _____ change.
   a. continuous, quantitative
   b. discontinuous, qualitative
   c. continuous, qualitative
   d. discontinuous, quantitative

5. In which of the following research designs is one group of subjects studied at different points in their lives?
   a. Cross-sectional **c.** Longitudinal
   b. Ethnographic **d.** Cross-cultural

6. Which of the following, according to social scientists who study human development, is true about cohorts?
   a. Cohorts refer to a group of individuals.
   b. Cohorts refer to individuals who are born within a defined span of years.
   c. Cohorts share the same historical experiences at the same time.
   d. All of the above.

7. In survey research, a _____ faithfully reflects the characteristics of the whole group of people, or _____, being studied.
   a. representative population; sample
   b. survey sample; population
   c. representative sample; population
   d. survey population; sample

8. Which of the following best describes the goals of developmental science?
   a. To understand and explain social norms
   b. To explain, record and influence human differences
   c. To describe, explain, predict, and influence development
   d. To study cohort effects across cultures

9. A researcher wants to study how exposure to toxic chemicals affects a developing human fetus. Which type of research would be best suited for this in terms of both methodology and research ethics?
   a. Case study **c.** Naturalistic observation
   b. Quasi-experimentation **d.** Experimentation

10. To overcome the weakness of naturalistic observation without negating the advantages, psychologists suggest that:
    a. the results should not be generalized.
    b. the influence of environment should be minimized.
    c. the observer should be blind to the environment.
    d. two or more observers could be used so that the observations can be cross-checked.

11. Which of the following ethical practices would you recommend as most important when talking to women who underwent sexual abuse during childhood?
    a. Keeping their spouses and/or parents informed
    b. Providing counseling services
    c. Sharing the results of other survivors
    d. Presenting the scope of survey differently

12. Judgments about individual adults' lives based on rigid applications of the social clock can lead to _____.
    a. ageism
    b. early death
    c. increased social support for the elderly
    d. unrealistically optimistic expectations for older adults' health and well-being

13. Which type of study is helpful for understanding development within the context of a particular culture?
    a. Longitudinal **c.** Ethnography
    b. Experiment **d.** Case study

14. Michael, age 16, has recently gained a considerable amount of weight but has not grown any taller. His father experienced a similar pattern of growth when he was a teenager. Theorists who suggest that Michael's growth pattern was inherited from his father emphasize the _____ side of the nature–nurture debate. Those who suggest that Michael's growth reflects behaviors that he has learned from his father emphasize the _____ side.
    a. nurture; nature **b.** nature; nurture

15. Nearly all adults who were children living in Saigon when the U.S. armed forces left Vietnam in 1975 report that their lives were changed by those events. This exemplifies which of the following?
    a. Normative critical periods
    b. Normative age-graded changes
    c. Nonnormative life events
    d. Normative history-graded changes

16. Philosopher John Locke characterized the mind of a child as _____.
    a. innately good **c.** corrupted by original sin
    b. the product of evolution **d.** a blank slate

17. Leigh is counting the number of aggressive acts that occur during a preschool class. She is using the _____ method to study aggression in young children.
- **a.** interdisciplinary observation
- **b.** naturalistic observation
- **c.** laboratory observation
- **d.** behavioral observation

18. Dr. Jones is studying children's selection of toys in a laboratory setting in which there are an equal number of "boy" and "girl" toys. In one condition, children are placed in the laboratory in mixed-gender groups. In the other, they are placed in the laboratory in single-gender groups. The independent variable in the experiment is _____.
- **a.** the toys that each child chooses to play with
- **b.** the gender of each child
- **c.** "boy" and "girl" toys
- **d.** mixed- and single-gender groups

19. Charlie was born with a chromosomal error that causes intellectual disabilities. Which method would be best for examining how this condition affects Charlie's development?
- **a.** Experiment
- **b.** Case study
- **c.** Correlation
- **d.** Quasi-experiment

20. According to the discussion of vulnerability and resilience in the text, which child has the greatest probability of a poor developmental outcome?
- **a.** A child born with a mild birth defect
- **b.** A child growing up in an impoverished environment
- **c.** A child with a mild birth defect who is growing up in an impoverished environment
- **d.** A child with a mild birth defect who is growing up in an impoverished environment with a parent who is addicted to drugs

21. Which of the following best describe the ideas of the philosopher Jean-Jacques Rousseau about human development?
- **a.** It is the result of an individual's efforts to overcome inborn tendency toward selfishness.
- **b.** It involves an individual's effort to fulfill his or her inborn potential.
- **c.** Environmental influences determine its outcome.
- **d.** It follows the same course as human evolution.

22. Which of the following best defines *sensitive period*?
- **a.** The time when the tension between nature and nurture is resolved in an organism's development
- **b.** A time of psychological fragility, usually due to some type of loss such as the death of a spouse, termination of employment, deterioration due to aging, etc.
- **c.** The period of time during which developmental norms for physical development are reached or achieved
- **d.** A specific period in development when an organism is particularly responsive to specific forms of experience or particularly influenced by their absence

23. *Psychopathology* and *abnormal behavior* are alternative terms for _____.
- **a.** normative age-graded changes
- **b.** critical difference effects
- **c.** placebo effects
- **d.** atypical development

24. You are taking part in a survey that asks about your attitudes toward physical punishment of children. Even though you believe that spanking is sometimes necessary, you answer that you are opposed to any sort of physical punishment. Which of the following terms best describes why you answered the way that you did?
- **a.** Randomness
- **b.** Sample representation
- **c.** Experimenter bias
- **d.** Social desirability

25. Which of the following is an example from this text of an inborn bias?
- **a.** The sequence of motor development varies from one child to another.
- **b.** Male infants show a propensity toward aggression.
- **c.** Children's speech begins with single words before proceeding onto sentences.
- **d.** The same methods of soothing work with almost all infants.

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chapter 2

Theories of Development

As you may have learned from raising your own "child" in *MyVirtualLife*, parents of infants have to make many decisions that have consequences for their children's physical and cognitive development: *Do I have to buy special, "educational" toys for him? What kind of music should I expose her to? Is it okay for a baby to watch television?* For example, when 7-month-old Zeke started crawling, his parents quickly learned that they would have to begin paying a lot more attention to what was on their floors. To their horror, Zeke

LEARNING OBJECTIVES

PSYCHOANALYTIC THEORIES

- **2.1** What are the main ideas of Freud's psychosexual theory?
- **2.2** What is the conflict associated with each of Erikson's psychosocial stages?
- **2.3** What are the strengths and weaknesses of psychoanalytic theory?

LEARNING THEORIES

- **2.4** How did Watson condition Little Albert to fear white, furry objects?
- **2.5** How does operant conditioning occur?
- **2.6** In what ways does social-cognitive theory differ from other learning theories?
- **2.7** How do the learning theories explain development?

COGNITIVE THEORIES

- **2.8** How does cognitive development progress, according to Piaget?
- **2.9** How did Vygotsky use the concepts of scaffolding and the zone of proximal development to explain cognitive development?
- **2.10** How does information-processing theory explain the findings of developmental psychologists such as Piaget and Vygotsky?
- **2.11** What are some of the important contributions of the cognitive theories?

BIOLOGICAL AND ECOLOGICAL THEORIES

- **2.12** How do behavior geneticists explain individual differences?
- **2.13** What kinds of behaviors are of interest to ethologists and sociobiologists?
- **2.14** What is the main idea of Bronfenbrenner's bioecological theory?

COMPARING THEORIES

- **2.15** What assumptions do the three families of theories make about development?
- **2.16** On what criteria do developmentalists compare the usefulness of theories?
- **2.17** What is eclecticism?

MyVirtualLife

What decisions would you make while raising a child? What would the consequences of those decisions be?

Find out by accessing MyVirtualLife at www.MyPsychLab.com to raise a virtual child and live your own virtual life.

discovered a dead cockroach midway through his first solo excursion across the living room. Before they could snatch it away, Zeke crushed the bug's dried-out body in his hand. He was just about to start licking the insect's shattered remains out of his palm when his mother scooped him up and carried him off to the kitchen sink for a thorough scrubbing of the contaminated appendage. What is it about infants that makes them want to put things, even disgusting and potentially harmful things like dead insects, into their mouths?

As you learned in Chapter 1, developmental psychologists use theories to formulate hypotheses, or testable answers, to "why" questions about behaviors such as these. At the broadest level are three very broad families of theories—*psychoanalytic theory*, *learning theory*, and *cognitive-developmental theory*. Theories that deal with the biological foundations of development and interactions between these and the environment extend developmentalists' understanding of age-related changes beyond the explanations that the three major theories provide. Thus, the most comprehensive explanations of developmental phenomena often include ideas from the psychoanalytic, learning, and cognitive approaches as well as those derived from biological and contextual theories.

This chapter will introduce you to the three major families of theories. These theories will come up again and again as you make your way through this text. This chapter will also acquaint you with other theoretical trends in the field of human development, and you will learn how developmental psychologists compare theories.

Psychoanalytic Theories

One way of explaining why babies often put things in their mouths would be to suggest that infants derive more physical pleasure from mouthing objects than from manipulating them with other parts of their bodies. Such an approach would most likely belong to the family of **psychoanalytic theories**, a school of thought that originated with Viennese physician Sigmund Freud (1856–1939). Psychoanalytic theorists believe that developmental change happens because internal drives and emotions influence behavior.

Freud's Psychosexual Theory

LO 2.1 What are the main ideas of Freud's psychosexual theory?

Freud derived most of his ideas about development from his work with the childhood memories of adults with serious mental disorders. One of his most important conclusions was that behavior is governed by both conscious and unconscious processes. The most basic of these unconscious processes is an internal drive for physical pleasure that Freud called the *libido*. He believed the libido to be the motivating force behind most behavior.

Freud also argued that personality has three parts. The **id** operates at an unconscious level and contains the libido—a person's basic sexual and aggressive impulses, which are present at birth. The **ego**, the conscious, thinking part of personality, develops in the first 2 to 3 years of life. One of the ego's jobs is to keep the needs of the id satisfied. For instance, when a person is hungry, the id demands food immediately, and the ego is supposed to find a way to obtain it. The **superego**, the portion of the personality that acts as a moral judge, contains the rules of society and develops near the end of early childhood, at about age 6. Once the superego develops, the ego's task becomes more complex. It must satisfy the id without violating the superego's rules.

psychoanalytic theories theories proposing that developmental change happens because of the influence of internal drives and emotions on behavior

id in Freud's theory, the part of the personality that comprises a person's basic sexual and aggressive impulses; it contains the libido and motivates a person to seek pleasure and avoid pain

ego according to Freud, the thinking element of personality

superego Freud's term for the part of personality that is the moral judge

NO EASY ANSWERS

The Repressed-Memory Controversy

Freud claimed that hidden memories of traumatic events suffered in childhood, such as sexual abuse, often lie hidden away, or *repressed*, in a person's unconscious and cause emotional distress that can lead to mental illness. Consequently, Freud thought that the goal of psychotherapy was to uncover such events and help individuals learn to cope with them. Memory researchers have found that some people who were abused as children forget the events for long periods of time, just as Freud predicted. However, most people retain vivid memories of traumatic childhood events (Baddeley, 1998; Lindsay & Read, 1994). Moreover, perpetrators of abuse are more likely to forget the incidents than are their victims (Taylor & Kopelman, 1984).

Memory experts also point out that therapists who suggest the possibility of repressed memories risk creating false memories in their clients' minds (Ceci & Bruck, 1993). However, repression does sometimes occur, and discovery of a repressed memory does sometimes improve a person's mental health. Thus, mental health professionals face a dilemma: Should they ignore the possibility of a repressed memory or risk creating a false one?

Therapists address the dilemma by obtaining training in techniques that can bring out repressed memories but don't directly suggest that such memories exist. For example, when clients believe they have recalled a repressed event, therapists help them look for concrete evidence. In the end, however, both therapist and client should recognize that they must often rely on flawed human judgment to decide whether a "recovered" memory was really repressed or was invented in the client's mind.

YOU DECIDE

Decide which of these two statements you most agree with and think about how you would defend your position:

1. ***If I thought that I had recovered a repressed memory of childhood abuse, I would prefer to have a skeptical therapist who would educate me about research findings showing that such memories are rarely forgotten.***
2. ***If I thought that I had recovered a repressed memory of childhood abuse, I would prefer to have a supportive therapist who would help me search for evidence of the abuse.***

The ego is responsible for keeping the three components of personality in balance. According to Freud, a person experiences tension when any of the three components is in conflict with another. For example, if a person is hungry, the id may motivate her to do anything to find food, but the ego—her conscious self—may be unable to find any. Alternatively, food may be available, but the ego may have to violate one of the superego's moral rules to get it. In such cases, the ego may generate *defense mechanisms*—ways of thinking about a situation that reduce anxiety (see *No Easy Answers*). **Explore** the **Concept** *The Id, Ego, and Superego* in **MyPsychLab**.

Many of Freud's patients had memories of sexual feelings and behavior in childhood. This led Freud to believe that sexual feelings are important to personality development. Based on his patients' childhood memories, Freud proposed a series of **psychosexual stages** through which a child moves in a fixed sequence determined by maturation (see Table 2.1, p. 26). In each stage, the libido is centered on a different part of the body. In the infant, the focus of the drive for physical pleasure is the mouth; the stage is therefore called the *oral stage*. As maturation progresses, the libido becomes focused on the anus (hence, the *anal stage*), and later on the genitals (the *phallic stage* and eventually the *genital stage*).

Optimum development, according to Freud, requires an environment that will satisfy the unique needs of each period. For example, the infant needs sufficient opportunity for oral stimulation. An inadequate early environment will result in *fixation*, characterized by behaviors that reflect unresolved problems and unmet needs. Thus, as you might guess from looking at the list of stages in Table 2.1, emphasis on the formative role of early experiences is a hallmark of psychoanalytic theories.

Freud's most controversial idea about early childhood is his assertion that children experience sexual attraction to the opposite-sex parent during the phallic stage (ages 3 to 6). Freud borrowed names for this conflict from Greek literature. Oedipus was a male character who was involved in a romantic relationship with his mother. Electra was a female character who had a similar relationship with her father. Thus, for a boy, the Oedipus complex involves a conflict between his affection for his mother and his fear of his father; for a girl, the Electra complex pits her bond with her father against her anxiety over the potential loss of her mother's love. In both genders, the complex is resolved by abandoning the quest to possess the opposite-sex parent in favor of identification with the same-sex parent. In other words, the phallic stage reaches a successful conclusion when boys develop a desire to be like their fathers and when girls begin to view their mothers as role models.

psychosexual stages Freud's five stages of personality development through which children move in a fixed sequence determined by maturation; the libido is centered in a different body part in each stage

TABLE 2.1 Freud's Psychosexual Stages

Stage	Approximate Ages	Focus of Libido	Major Developmental Task	Some Characteristics of Adults Fixated at This Stage
Oral	Birth to 1 year	Mouth, lips, tongue	Weaning	Oral behavior, such as smoking and overeating; passivity and gullibility
Anal	1 to 3 years	Anus	Toilet training	Orderliness, obstinacy or messiness, disorganization
Phallic	3 to 6 years	Genitals	Resolving Oedipus/Electra complex	Vanity, recklessness, sexual dysfunction or deviancy
Latency*	6 to 12 years	None	Developing defense mechanisms; identifying with same-sex peers	None
Genital	12 years	Genitals	Achieving mature sexual intimacy	Adults who have successfully integrated earlier stages should emerge with sincere interest in others and mature sexuality

*Freud thought that the latency period is not really a psychosexual stage because libido is not focused on the body during this period; therefore, fixation is impossible.

Erikson's Psychosocial Theory

LO 2.2 What is the conflict associated with each of Erikson's psychosocial stages?

Many of Freud's critics accepted his assertion that unconscious forces influence development, but they questioned his rather gloomy view that childhood trauma nearly always leads to emotional instability in adulthood. Later theorists, known as *neo-Freudians*, proposed ideas that built on the strengths of Freud's theory but tried to avoid its weaknesses. **Watch** the **Video** *Introduction to Human Development: Erik Erikson* in **MyPsychLab**.

Erik Erikson (1902–1994) is the neo-Freudian theorist who has had the greatest influence on the study of development (Erikson, 1950, 1959, 1980, 1982; Erikson, Erikson, & Kivnick, 1986; Evans, 1969). Erikson thought development resulted from the interaction between internal drives and cultural demands; thus, his theory refers to **psychosocial stages** rather than to psycho*sexual* ones. Furthermore, Erikson thought that development continued through the entire lifespan. **Explore** the **Concept** *Erikson's Stages of Psychosocial Development* in **MyPsychLab**.

In Erikson's view, to achieve a healthy personality, an individual must successfully resolve a crisis at each of the eight stages of development, or *crises*, as summarized in Table 2.2. The key idea underlying Erikson's theory is that each new crisis is thrust on the developing person because of changes in social demands that accompany changes in age. Moreover, each crisis is defined by a pair of opposing possibilities. Successful resolution of a crisis results in the development of the characteristic on the positive side of the dichotomy. A healthy resolution, however, does not mean moving totally to the positive side. For example, an infant needs to have experienced some mistrust in order to learn to identify people who are not trustworthy. But healthy development requires a favorable ratio of positive to negative.

According to Erikson, the four childhood stages form the foundation of adult personality. The outcome of the first stage, *trust versus mistrust* (birth to 1 year), depends on the reliability of the care and affection infants receive from their primary caretaker. During the second stage, *autonomy versus shame and doubt*, children aged 1 to 3 express their independence. To help children resolve this crisis, caretakers must encourage them to function independently with regard to self-care skills, such as dressing themselves. In the third stage, *initiative versus guilt*, 3- to 6-year-olds begin to develop a sense of social initiative. In order to do so, a child needs opportunities to interact with peers during this stage. During the fourth stage, *industry versus inferiority*, children focus on acquiring culturally valued skills. In order to emerge from this stage with a sense of industry, children need support and encouragement from adults.

Erikson's description of the transition from childhood to adulthood, the *identity versus role confusion* stage, has been particularly influential. He argued that, in order to arrive at a mature

psychosocial stages Erikson's eight stages, or crises, of personality development in which inner instincts interact with outer cultural and social demands to shape personality

TABLE 2.2 Erikson's Psychosocial Stages

Approximate Ages	Stage	Positive Characteristics Gained and Typical Activities
Birth to 1 year	Trust versus mistrust	Hope; trust in primary caregiver and in one's own ability to make things happen (secure attachment to caregiver is key)
1 to 3 years	Autonomy versus shame and doubt	Will; new physical skills lead to demand for more choices, most often seen as saying "no" to caregivers; child learns self-care skills such as toileting
3 to 6 years	Initiative versus guilt	Purpose; ability to organize activities around some goal; more assertiveness and aggressiveness (Oedipus conflict with parent of same sex may lead to guilt)
6 to 12 years	Industry versus inferiority	Competence; cultural skills and norms, including school skills and tool use (failure to master these leads to sense of inferiority)
12 to 18 years	Identity versus role confusion	Fidelity; adaptation of sense of self to pubertal changes, consideration of future choices, achievement of a more mature sexual identity, and search for new values
18 to 30 years	Intimacy versus isolation	Love; persons develop intimate relationships beyond adolescent love; many become parents
30 years to late adulthood	Generativity versus stagnation	Care; people rear children, focus on occupational achievement or creativity, and train the next generation; turn outward from the self toward others
Late adulthood	Integrity versus despair	Wisdom; person conducts a life review, integrates earlier stages and comes to terms with basic identity; develops self-acceptance

sexual and occupational identity, every adolescent must examine his identity and the roles he must occupy. He must achieve an integrated sense of self, of what he wants to do and be, and of his appropriate sexual role. The risk is that the adolescent will suffer from confusion arising from the profusion of roles opening up to him at this age.

Erikson's adulthood stages are not strongly tied to age. In the first, the young adult builds on the identity established in adolescence to confront the crisis of *intimacy versus isolation*. Erikson hypothesized that an individual's capacity for intimacy is dependent upon a positive resolution of the identity crisis (Erikson, 1963). Many young people, Erikson thought, make the mistake of thinking they will find their identity in a relationship, but in his view, it is only those who have already formed (or are well on the way to forming) a clear identity who can successfully enter this fusion of identities that he called *intimacy*. Young adults whose identities are weak or unformed will remain in shallow relationships and will experience a sense of isolation or loneliness.

The middle and late adulthood crises are shaped by the realization that death is inevitable. Middle-aged adults confront the crisis of *generativity versus stagnation*, which is "primarily the concern in establishing and guiding the next generation" (Erikson, 1963, p. 267). The rearing of children is the most obvious way to achieve a sense of generativity. Doing creative work, giving service to an organization or to society, or serving as a mentor to younger colleagues can help a midlife adult achieve a sense of generativity. Failing that, a self-absorbed, nongenerative adult may feel a sense of stagnation. Finally, older adults experience *ego integrity versus despair*. The goal of this stage is an acceptance of one's life in preparation for facing death in order to avoid a sense of despair.

Adhering to group norms regarding which clothes are "in" and "out" is one of the ways that Erikson says teenagers begin to construct a sense of identity that distinguishes them from their parents.

Evaluation of Psychoanalytic Theories

LO 2.3 What are the strengths and weaknesses of psychoanalytic theory?

Psychoanalytic theories such as Freud's and Erikson's, summarized in Table 2.3, have several attractive aspects. Most centrally, they highlight the importance of a child's earliest relationships with caregivers.

TABLE 2.3 Psychoanalytic Theories

Theory	Main Idea	Evaluation	
		Strengths	Weaknesses
Freud's psychosexual theory	Personality develops in five stages from birth to adolescence; in each stage, the need for physical pleasure is focused on a different part of the body.	Emphasizes the importance of experiences in infancy and early childhood; provides psychological explanations for mental illness.	Sexual feelings are not as important in personality development as Freud claimed.
Erikson's psychosocial theory	Personality develops through eight life crises across the entire lifespan; a person finishes each crisis with either a good or poor resolution.	Helps explain the role of culture in personality development; important in lifespan psychology; useful description of major themes of personality development at different ages.	Describing each period in terms of a single crisis is probably an oversimplification.

Furthermore, they suggest that a child's needs change with age, so parents and other caregivers must continually adapt to the changing child. One implication is that we should not think of "good parenting" as an unchanging quality. Some people may be very good at meeting the needs of an infant but less capable of dealing with teenagers' identity struggles. The child's eventual personality and her overall mental health thus depend on the interaction pattern that develops in a particular family. The idea of changing needs is an extremely attractive element of these theories because more and more of the research in developmental psychology is moving developmentalists toward just such a conception of the process.

Psychoanalytic theory has also given psychologists a number of helpful concepts, such as the unconscious, the ego, and identity, which have become a part of everyday language as well as theory. Moreover, psychologists are taking a fresh look at Freud's ideas about the importance of defense mechanisms in coping with anxiety (e.g., Malone, Cohen, Liu, Vaillant, & Waldinger, 2013). Freud is also usually credited with the invention of psychotherapy, which is still practiced today. An additional strength of the psychoanalytic perspective is the emphasis on continued development during adulthood found in Erikson's theory. His ideas have provided a framework for a great deal of new research and theorizing about adult development. The major weakness of psychoanalytic theories is the fuzziness of many of their concepts. For example, how could researchers detect the presence of the id, ego, superego, and so on? Without more precise definitions, it is extremely difficult to test these theories, despite their provocative explanations of development.

test yourself before going on

Answers to these questions can be found in the back of the book.

1. Psychoanalytic theories share the belief that _____ and _____ _____ shape development.

2. Write "F" for each concept or term that belongs to Freud's theory, and "E" for each that belongs to Erikson's theory.
   - _____(1) psychosocial
   - _____(2) psychosexual
   - _____(3) id, ego, superego
   - _____(4) eight stages from birth to death
   - _____(5) five stages from birth to adolescence
   - _____(6) libido is driving force behind development
   - _____(7) development consists of a series of crises
   - _____(8) young child is attracted to the opposite-sex parent
   - _____(9) defense mechanisms
   - _____(10) interaction between internal drives and cultural demands

CRITICAL THINKING

3. In which of Erickson's psychological stages would you place yourself? Does Erikson's description of it correspond to the challenges and concerns you are confronting?

Learning Theories

Psychologist John Watson (1878–1958) offered ideas about human development that were very different from those of Freud. Watson believed that, through manipulation of the environment, children could be trained to be or do anything (Jones, 1924; Watson, 1930). To refer to this point of view, Watson coined the term **behaviorism**, which defines development in terms of behavior changes caused by environmental influences. As Watson put it,

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

Watson's views represent a way of thinking about development that is common to all of the **learning theories**. These theories assert that development results from an accumulation of experiences. As you will see, however, each of the learning theories has a distinctive way of explaining how experience shapes development.

Classical Conditioning

LO 2.4 How did Watson condition Little Albert to fear white, furry objects?

Watson based many of his ideas about the relationship between learning and development on the work of Russian physiologist and Nobel Prize Winner Ivan Pavlov (1849–1936). Pavlov discovered that organisms can acquire new signals for existing responses (behaviors). The term **classical conditioning** refers to this principle. Each incidence of learning begins with a biologically programmed stimulus–response connection, or *reflex*. For example, salivation happens naturally when you put food in your mouth. In classical conditioning terms, the food is the *unconditioned (unlearned, natural) stimulus*; salivating is an *unconditioned (unlearned, natural) response*.

Stimuli presented just before or at the same time as the unconditioned stimulus are those that are likely to be associated with it. For example, most foods have odors, and to get to your mouth, food has to pass near your nose. Thus, you usually smell food before you taste it. Food odors eventually become *conditioned* (*learned*) *stimuli* that elicit salivation. In effect, they act as a signal to your salivary glands that food is coming. Once the connection between food odors and salivation has been established, smelling food triggers the salivation response even when you do not actually eat the food. When a response occurs reliably in connection with a conditioned stimulus in this way, it is known as a *conditioned* (*learned*) *response*. For Watson, Pavlov's principles of classical conditioning held the key to understanding human development. He viewed developmental change as nothing more than the acquisition of connections between stimuli and responses. To prove his point, Watson set out to show that he could use the principles of classical conditioning to cause an infant to develop a new emotional response to a stimulus. Watson's hapless subject, 11-month-old "Little Albert," was exposed to loud noises while he played with a white rat, a stimulus that had fascinated him when it was first introduced. As a result of the pairing of the rat with the noises, however, Albert learned to fear the rat so thoroughly that he cried hysterically at the mere sight of the rodent. Moreover, he generalized his fear of the rat to other white, fuzzy objects such as a rabbit, a fur coat, and a Santa Claus mask. **Explore** the **Concept** *Classical Conditioning of Little Albert* in **MyPsychLab**.

As you might guess, Watson's experiment would be regarded as unethical by today's standards. Moreover, few developmentalists would agree with Watson's assertion that classical conditioning explains all of human development. Yet the Little Albert experiment demonstrated that classical conditioning may indeed be the source of developmental changes that involve emotional responses. For this reason, classical conditioning continues to have a place in the study of human development. It is especially important in infancy. Because a child's mother or father is present so often when nice things happen, such as when the child feels warm, comfortable, and cuddled, the mother and father usually serve as conditioned stimuli

behaviorism the view that defines development in terms of behavior changes caused by environmental influences

learning theories theories asserting that development results from an accumulation of experiences

classical conditioning learning that results from the association of stimuli

DEVELOPMENTAL SCIENCE IN THE CLASSROOM

Systematic Desensitization

Dr. Rawlins is a psychologist who works in a large urban school district. When confronted with a child who exhibits *school refusal*, Dr. Rawlins begins by determining whether there is a concrete reason for the child to refuse to go to school, such as the fear of being bullied. If such a reason is found, she works with the child's teachers and school administrators to address the problem. In most cases of school refusal, however, children do not want to go to school because they feel anxious in the school setting (Kauffman, 2005).

The mechanisms at work in John Watson's experiment with Little Albert hold the key to helping children overcome school refusal. Psychologists speculate that, among children who refuse to go to school, the neutral stimulus of school has become associated with stimuli that naturally provoke anxious responses in children. Consequently, psychologists reason that children's fear of school can be unlearned through the same stimulus–response mechanism that produced it. Thus, like many other psychologists, Dr. Rawlins uses a technique called *systematic desensitization* to help children with school refusal learn to respond to the school setting differently (Kauffman, 2005; Wolpe, 1958). She begins by teaching the child how to control his respiration rate and muscular contractions in order to achieve a state of physical relaxation. Afterward, Dr. Rawlins helps him learn to "switch on" his relaxation response in connection with each step in the sequence of events that are involved in getting to and staying in school. For example, he will first learn to intentionally relax while getting ready for school. Next, he will practice intentionally relaxing while waiting for the bus and then while he is on the bus. Once at school, the therapist will encourage him to initiate his relaxation response in front of the school entrance. The final step will be to learn to intentionally relax in the classroom and to initiate the relaxation response whenever he experiences feelings of anxiety during the school day. As a result, the child will learn to associate going to school with the relaxation responses rather than with anxiety.

REFLECTION

1. ***How could systematic desensitization be used to help a child who was bitten by a dog overcome her subsequent fear of all dogs?***
2. ***What actions on the part of parents, teachers, or peers might prevent a child with school refusal from benefiting from systematic desensitization?***

for pleasant feelings, a fact that makes it possible for the parents' presence to comfort a child. Moreover, classical conditioning is the basis of several useful therapies for anxiety problems (see *Developmental Science in the Classroom* above).

Skinner's Operant Conditioning

LO 2.5 How does operant conditioning occur?

Another behavioral approach to development may be found in a set of learning principles known collectively as **operant conditioning**, a term coined by B. F. Skinner (1904–1990), the most famous proponent of this theory (Skinner, 1953, 1980). Operant conditioning involves learning to repeat or stop behaviors because of the consequences they bring about. **Reinforcement** is anything that follows a behavior and causes it to be repeated. **Punishment** is anything that follows a behavior and causes it to stop.

A *positive reinforcement* is a consequence (usually involving something pleasant) that follows a behavior and increases the chances that the behavior will occur again. For example, if you buy a scratch ticket and win $100, you will probably be more willing to buy another ticket in the future than you would if you hadn't won the money.

Negative reinforcement occurs when an individual learns to perform a specific behavior in order to cause something unpleasant to stop. For example, coughing is an unpleasant experience for most of us, and taking a dose of cough medicine usually stops it. As a result, when we begin coughing, we reach for the cough syrup. The behavior of swallowing a spoonful of cough syrup is reinforced by the cessation of coughing.

Positive and negative reinforcement often interact in complex ways in real-life contexts. For example, most people understand that paying attention to a preschooler's whining is likely to increase it—an example of positive reinforcement. However, parents learn to attend to whining preschoolers because whining is irritating, and responding to it usually makes it stop. In other words, like taking cough syrup for an annoying cough, the parents' behavior of responding to whining is negatively reinforced by its consequence—namely, that the child *stops* whining.

In contrast to both kinds of reinforcement, punishment stops a behavior. Sometimes punishments involve eliminating nice things—taking away TV or video-game privileges, for example. However, punishment may also involve unpleasant things such as scolding. Like reinforcement, however, punishment is defined by its effect. Consequences that do not stop behavior can't be properly called punishments.

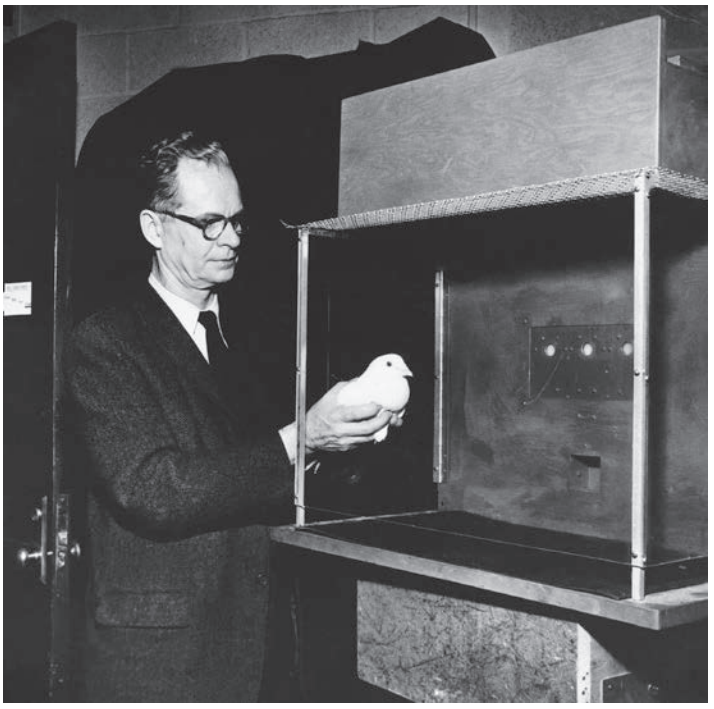
operant conditioning learning to repeat or stop behaviors because of their consequences

reinforcement anything that follows a behavior and causes it to be repeated

punishment anything that follows a behavior and causes it to stop

An alternative way to stop an unwanted behavior is **extinction**, which is the gradual elimination of a behavior through repeated nonreinforcement. If a teacher succeeds in eliminating a student's undesirable behavior by ignoring it, the behavior is said to have been *extinguished*.

Such examples illustrate the complex manner in which reinforcements and punishments operate in the real world. In laboratory settings, operant-conditioning researchers usually work with only one participant or animal subject at a time; they needn't worry about the social consequences of behaviors or consequences. They can also control the situation so that a particular behavior is reinforced every time it occurs. In the real world, *partial reinforcement*—reinforcement of a behavior on some occasions but not others—is more common. Studies of partial reinforcement show that people take longer to learn a new behavior under partial reinforcement conditions; once established, however, such behaviors are very resistant to extinction.



Laboratory research involving animals was important in the development of Skinner's operant conditioning theory.

Most parents try to use consequences to change their children's behavior. Few realize that, in many cases, they may actually be strengthening those behaviors. Consider the example of a father whose 3-year-old son repeatedly demands attention while the father is fixing dinner. The first three, or five, or seven times the child says "Dad" or tugs at the father's pants leg, the father ignores him. But after the eighth or ninth repetition, with the child's voice getting whinier each time, the father can't stand it anymore: "All right! What do you want?" The parent thereby creates a pattern of partial reinforcement that encourages the child to be even more demanding. In effect, the child becomes like a gambler who deposits token after token in a slot machine, knowing that he will eventually hit the jackpot. Thus, parents may have more success in changing children's behavior if they administer an appropriate consequence the first time an unwanted behavior occurs.

Bandura's Social-Cognitive Theory

LO 2.6 In what ways does social-cognitive theory differ from other learning theories?

Learning theorist Albert Bandura (b. 1925), whose ideas are more influential among developmental psychologists than those of the conditioning theorists, argues that learning does not always require reinforcement (1977b, 1982, 1989). Learning may also occur as a result of watching someone else perform some action and experience reinforcement or punishment. Learning of this type, called **observational learning**, or **modeling**, is involved in a wide range of behaviors. For example, observant school children learn to distinguish between strict and lenient teachers by observing teachers' reactions to the misbehaviors of children who are risk takers—that is, those who act out without having determined how teachers might react. Observant children, when in the presence of strict teachers, suppress forbidden behaviors such as talking out of turn and leaving their seats without permission. By contrast, when they are under the authority of lenient teachers, these children may display just as much misbehavior as their risk-taking peers. **Explore** the **Concept** *Bandura's Study on Observational Learning* in **MyPsychLab**.

Bandura points out that what an observer learns from watching someone else will depend on two cognitive elements: what she pays attention to and what she is able to remember. Moreover, to learn from a model, an observer must be physically able to imitate the behavior and motivated to perform it on her own. Because attentional abilities, memory, physical capabilities, and motivations change with age, what a child learns from any given modeled event may be quite different from what an adult learns from an identical event (Grusec, 1992).

extinction the gradual elimination of a behavior through repeated nonreinforcement

observational learning, *or* **modeling** learning that results from seeing a model reinforced or punished for a behavior

Modeling is an important source of learning for both children and adults. What behaviors have you learned by watching and copying others?

As children, according to Bandura, we learn not only overt behavior, but also ideas, expectations, internal standards, and self-concepts, from models. At the same time, we acquire expectancies about what we can and cannot do—which Bandura (1997) calls *self-efficacy*. Once those standards and those expectancies or beliefs have been established, they affect the child's behavior in consistent and enduring ways. For example, you'll learn in Chapter 12 that self-efficacy beliefs influence our overall sense of well-being and even our physical health.

Evaluation of Learning Theories

LO 2.7 How do the learning theories explain development?

Several implications of learning theories, summarized in Table 2.4, are worth emphasizing. First, learning theories can explain both consistency and change in behavior. If a child is friendly and smiling both at home and at school, learning theorists would explain this behavior by saying that the child is being reinforced for it in both settings. It is equally possible to explain why a child is happy at home but miserable at school. We need only hypothesize that the home environment reinforces cheerful behavior but the school setting does not.

Learning theorists also tend to be optimistic about the possibility of change. Children's behavior can change if the reinforcement system—or their beliefs about themselves—change. So, problem behavior can be modified.

TABLE 2.4 Learning Theories

		Evaluation	
Theory	**Main Idea**	**Strengths**	**Weaknesses**
Pavlov's classical conditioning	Learning happens when neutral stimuli become so strongly associated with natural stimuli that they elicit the same response.	Useful in explaining how emotional responses such as phobias are learned.	Explanation of behavior change is too limited to serve as comprehensive theory of human development.
Skinner's operant-conditioning theory	Development involves behavior changes that are shaped by reinforcement and punishment.	Basis of many useful strategies for managing and changing human behavior.	Humans are not as passive as Skinner claimed; the theory ignores hereditary, cognitive, emotional, and social factors in development.
Bandura's social-learning theory	People learn from models; what they learn from a model depends on how they interpret the situation cognitively and emotionally.	Helps explain how models influence behavior; explains more about development than other learning theories do because of addition of cognitive and emotional factors.	Does not provide an overall picture of development.

The great strength of learning theories is that they seem to give an accurate picture of the way in which many behaviors are learned. It is clear that both children and adults learn through conditioning and modeling. Furthermore, Bandura's addition of mental elements to learning theory adds further strength, since it allows an integration of learning models and other approaches.

However, the learning theorists' approach is not really developmental; it doesn't tell us much about change with age, either in childhood or in adulthood. Even Bandura's variation on learning theory does not tell us whether there are any changes with age in what a child can learn from modeling. Thus, learning theories help developmentalists understand how specific behaviors are acquired but do not contribute to an understanding of age-related change.

test yourself before going on

Study and Review in MyPsychLab

Answers to these questions can be found in the back of the book.

1. Pavlov's experiments addressed (classical/operant) conditioning; Skinner's dealt with (classical, operant) conditioning.
2. A consequence that causes a behavior to be repeated is a _____; one that stops a behavior is a _____.
3. According to Bandura, what four factors explain why learning from a model is not an automatic process?
4. Eight-year-old Rodney does not believe he can learn how to hit a baseball. According to Bandura, Rodney has low _____ with regard to this behavior.

CRITICAL THINKING

5. Can you describe instances in your everyday life when your behavior is affected by classical conditioning, operant conditioning, and observational learning? How do you use these same principles to affect others' behavior?

Cognitive Theories

The group of theories known as **cognitive theories** emphasize mental aspects of development such as logic and memory. Have you ever watched a baby throw things out of her mother's shopping cart? No matter how many objects the baby drops, she watches each one intently as if she has no idea where it's going to land. Why do babies engage in repetitive actions of this kind? One reason might be that they use their motor skills (throwing things) and senses (watching them) to build mental pictures of the world around them. Thus, infants drop objects and watch them fall until they have learned all they can from this behavior; then they move on to a more mature way of interacting with the world.

cognitive theories theories that emphasize mental processes in development, such as logic and memory

Piaget's Cognitive-Developmental Theory

LO 2.8 How does cognitive development progress, according to Piaget?

One of the most influential theories in the history of developmental psychology is that of Swiss developmentalist Jean Piaget (1896–1980). Originally educated as a natural scientist, Piaget spent six decades studying the development of logical thinking in children. Because of the popularity of Watson's views, psychologists in the United States paid little attention to Piaget's work. During the late 1950s, however, American developmentalists "discovered" Piaget. Developmental psychologists in the United States then began to focus on children's thinking more than on how environmental stimuli influenced their behavior.

Piaget was struck by the fact that all children seem to go through the same sequence of discoveries about their world, making the same mistakes and arriving at the same solutions (Piaget, 1952, 1970, 1977; Piaget & Inhelder, 1969). For example, all 3- and 4-year-olds seem to think that if water is poured from a short, wide glass into a taller, narrower one, there is then more water because the water level is higher in the narrow glass than it was in the wide glass. In contrast, most 7-year-olds realize that the amount of water has not changed. To explain such age differences, Piaget proposed several concepts that continue to guide developmental research.

Piaget based many of his ideas on naturalistic observations of children of different ages on playgrounds and in schools.

Using Piaget's terminology, we would say this infant is assimilating the object to her grasping scheme.

A pivotal idea in Piaget's model is that of a **scheme**, an internal cognitive structure that provides an individual with a procedure to follow in a specific circumstance. For example, when you pick up a ball, you use your picking-up scheme. Piaget proposed that each of us begins life with a small repertoire of sensory and motor schemes, such as looking, tasting, touching, hearing, and reaching. As we use each scheme, it becomes better adapted to the world; in other words, it works better. During childhood and adolescence, mental schemes allow us to use symbols and think logically. Piaget proposed three processes to explain how children get from built-in schemes such as looking and touching to the complex mental schemes used in childhood, adolescence, and adulthood.

Assimilation is the process of using schemes to make sense of experiences. Piaget would say that a baby who grasps a toy is *assimilating* it to his grasping scheme. The complementary process is **accommodation**, which involves changing the scheme as a result of some new information acquired through assimilation. When the baby grasps a square object for the first time, he will accommodate his grasping scheme; the next time he reaches for a square object, his hand will be more appropriately bent to grasp it. Thus, the process of accommodation is the key to developmental change. Through accommodation, we improve our skills and reorganize our ways of thinking.

Equilibration is the process of balancing assimilation and accommodation to create schemes that fit the environment. To illustrate, think about infants' tendency to put things in their mouths. In Piaget's terms, they assimilate objects to their mouthing scheme. As they mouth each one, their mouthing scheme changes to include the instructions "*Do* mouth this" or "*Don't* mouth this." The accommodation is based on mouthing experiences. A pacifier feels good in the mouth, but a dead insect has an unpleasant texture. So, eventually, the mouthing scheme says it's okay to put a pacifier in the mouth, but it's not okay to do the same with a dead insect. In this way, an infant's mouthing scheme attains a better fit with the real world.

Piaget's research suggested to him that logical thinking evolves in four stages. During the *sensorimotor stage*, from birth to 18 months, infants use their sensory and motor schemes to act on the world around them. In the *preoperational stage*, from 18 months to about age 6, youngsters acquire symbolic schemes, such as language and fantasy, that they use in thinking and communicating. Next comes the *concrete operational stage*, during which 6- to 12-year-olds begin to think logically and become capable of solving problems such as the one illustrated in Figure 2.1.

scheme in Piaget's theory, an internal cognitive structure that provides an individual with a procedure to use in a specific circumstance

assimilation the process of using a scheme to make sense of an event or experience

accommodation changing a scheme as a result of some new information

equilibration the process of balancing assimilation and accommodation to create schemes that fit the environment

Figure 2.1 A Conservation Task

In one of the problems Piaget devised, a child is shown two glasses of the same size filled with equal amounts of liquid. Next, the researcher pours one glass of liquid into a taller, thinner glass and asks the child if the two glasses still contain the same amount of liquid. A preoperational thinker will say that one glass now contains more liquid than the other and will base his answer on appearance. "This glass has more because the liquid is higher now." A concrete operational thinker will say that the two still contain the same amount of liquid because no liquid was added or taken away from either.

TABLE 2.5 Piaget's Cognitive-Developmental Stages

Approximate Ages	Stage	Description
Birth to 18 months	Sensorimotor	The baby understands the world through her senses and her motor actions; she begins to use simple symbols, such as single words and pretend play, near the end of this period.
18 months to 6 years	Preoperational	By age 2, the child can use symbols both to think and to communicate; by the end of this stage he develops the abilities to take others' points of view, classify objects, and use simple logic.
6 to 12 years	Concrete operational	The child's logic takes a great leap forward with the development of new internal operations, such as conservation and class inclusion, but is still tied to the known world; by the end of the period, he can reason about simple "what if" questions.
12 years	Formal operational	The child begins to manipulate ideas as well as objects; she thinks hypothetically and, by adulthood, can easily manage a variety of "what if" questions; she greatly improves her ability to organize ideas and objects mentally.

The last phase is the *formal operational stage*, in which adolescents learn to think logically about abstract ideas and hypothetical situations.

Table 2.5 describes these stages more fully; you will read about each of them in detail later in the text. For now, it is important to understand that in Piaget's view, each stage grows out of the one that precedes it, and each involves a major restructuring of the child's way of thinking. It's also important to know that research has confirmed Piaget's belief that the sequence of the stages is fixed. However, children progress through them at different rates. In addition, some individuals do not attain the formal operational stage in adolescence or even in adulthood. Consequently, the ages associated with the stages are approximations.

Vygotsky's Sociocultural Theory

LO 2.9 How did Vygotsky use the concepts of scaffolding and the zone of proximal development to explain cognitive development?

Lev Vygotsky's **sociocultural theory** asserts that complex forms of thinking have their origins in social interactions rather than in the child's private explorations, as Piaget thought. According to Vygotsky, children's learning of new cognitive skills is guided by an adult (or a more skilled child, such as an older sibling), who structures the child's learning experience—a process Vygotsky called *scaffolding*. To create an appropriate scaffold, the adult must gain and keep the child's attention, model the best strategy, and adapt the whole process to the child's developmental level, or *zone of proximal development* (Landry, Garner, Swank, & Baldwin, 1996; Rogoff, 1990). Vygotsky used this term to signify tasks that are too hard for the child to do alone but that he can manage with guidance. For example, parents of a beginning reader provide a scaffold when they help him sound out new words.

Vygotsky's ideas have important educational applications. Like Piaget's, Vygotsky's theory suggests the importance of opportunities for active exploration. But assisted discovery would play a greater role in a Vygotskian than in a Piagetian classroom; the teacher would provide the scaffolding for children's discovery, through questions, demonstrations, and explanations (Tharp & Gallimore, 1988). To be effective, the assisted discovery processes would have to be within the zone of proximal development of each child.

sociocultural theory Vygotsky's view that complex forms of thinking have their origins in social interactions rather than in an individual's private explorations

information-processing theory a theoretical perspective that uses the computer as a model to explain how the mind manages information

Developmental psychologist Lev Vygotsky hypothesized that social interactions among children, such as the 2-year-old boy and girl playing here, are critical to both cognitive and social development.

Information-Processing Theory

LO 2.10 How does information-processing theory explain the findings of developmental psychologists such as Piaget and Vygotsky?

The goal of **information-processing theory** is to explain how the mind manages information (Munakata, 2006). Theorizing about and studying

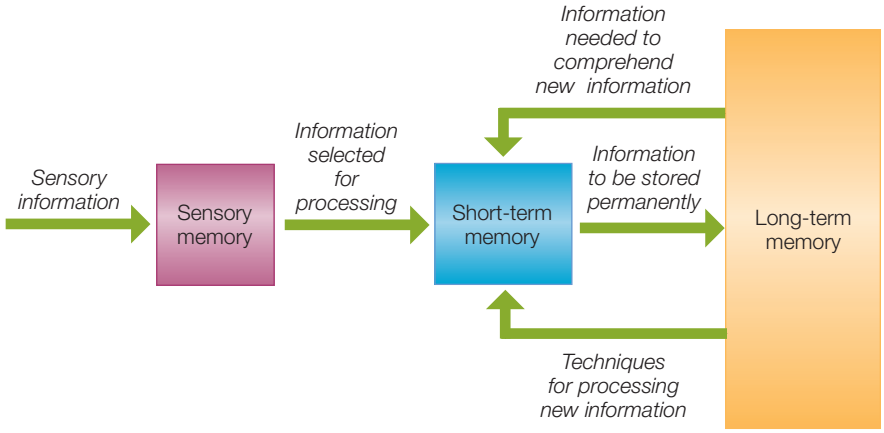


Figure 2.2 The Information-Processing System

Information-processing research on memory is based on the assumption that information moves into, out of, and through the sensory, short-term, and long-term memories in an organized way.

memory processes are central to information-processing theory. Most memory research assumes that the human memory is made up of multiple components. The idea is that information moves through these components in an organized way (see Figure 2.2). The process of understanding a spoken word serves as a good example. First, you hear the word when the sounds enter your *sensory memory*. Your experiences with language allow you to recognize the pattern of sounds as a word. Next, the word moves into your *short-term memory*, the component of the memory system where all information is processed. Thus, short-term memory is often called *working memory*. Knowledge of the word's meaning is then called up out of *long-term memory*, the component of the system where information is permanently stored, and placed in short-term memory, where it is linked to the word's sounds to enable you to understand it.

According to the information-processing model, children presented with problems such as Piaget's conservation tasks process the information they need to solve such problems in their short-term memories. As you will learn in Chapter 7, a great deal of research has shown that younger children's short-term memories are both more limited in capacity and less efficient than those of older children (Kail, 1990, 2008). Consequently, some developmentalists have used information-processing theory to explain Piaget's stages. Their theories are called **neo-Piagetian theories** because they expand on Piaget's theory rather than contradict it (Case, 1985, 1997). As you'll learn in Chapter 7, according to neo-Piagetians, older children and adults can solve complex problems like those in Piaget's research because they can hold more pieces of information in their short-term memories at the same time than younger children can (Kail 1990, 2008).

Evaluation of Cognitive Theories

LO 2.11 What are some important contributions of the cognitive theories?

Research based on cognitive theories, especially the work of Piaget, has demonstrated that simplistic views, such as those of the conditioning theorists, cannot explain the development of the complex phenomenon that is logical thinking. Moreover, since his work was first published in the 1920s Piaget's research findings have been replicated in virtually every culture and in every cohort of children. Thus, not only did he formulate a theory that forced psychologists to think about child development in a new way, he also provided a set of findings that were impossible to ignore and difficult to explain. In addition, he developed innovative methods of studying children's thinking that continue to be important today (see the *Research Report* on page 60).

Nevertheless, Piaget turned out to be wrong about some of the ages at which children develop particular skills. As you will see in later chapters, researchers have found that children develop some intellectual skills at earlier ages than Piaget's findings suggested. Furthermore, Piaget was probably wrong about the generality of the stages themselves. Most 8-year-olds, for example, show concrete operational thinking on some tasks but not on others, and they are more likely to show complex thinking on familiar tasks than on unfamiliar tasks. Thus, the whole process seems to be a great deal less stagelike than Piaget proposed.

At present, there is insufficient evidence to either support or contradict most of Vygotsky's ideas (Crain, 2011). However, studies have shown that children in pairs and groups do produce

neo-Piagetian theory an approach that uses information-processing principles to explain the developmental stages identified by Piaget

more sophisticated ideas than individual children who work on problems alone (Tan-Niam, Wood, & O'Malley, 1998). Moreover, researchers have found that young children whose parents provide them with more scaffolding during the preschool years exhibit higher levels of achievement in elementary school than peers whose parents provide less support of this kind (Neitzel & Stright, 2003). Thus, future research may support the conclusion that Vygotsky's theory constitutes an important contribution to a full understanding of human development.

In contrast to Vygotsky's theory, the information-processing approach to cognitive development has received a great deal of empirical support (Birney & Sternberg, 2011). These findings have helped to clarify some of the cognitive processes underlying Piaget's findings. This approach, furthermore, has greatly enhanced developmentalists' understanding of human memory. Critics, however, have pointed out that much information-processing research involves artificial memory tasks such as learning lists of words. Therefore, say critics, research based on the information-processing approach doesn't always accurately describe how memory works in the real world. Consequently, as Piaget did, information-processing theorists may underestimate children's capabilities with regard to real-world tasks.

Piagetians claim that information-processing theory emphasizes explanations of single cognitive tasks at the expense of a comprehensive picture of development. Finally, critics of both cognitive theories say that they ignore the role of emotions in development. The cognitive theories are summarized in Table 2.6.

test yourself before going on

Answers to these questions can be found in the back of the book.

1. Piaget defined _____ as cognitive structures that provide a procedure to follow in a specific situation.
2. Match each term with its definition:
   _____(1) assimilation
   _____(2) accommodation
   _____(3) equilibration
   (a) changing a scheme in response to new information
   (b) adapting schemes to the real world
   (c) incorporating new information into an existing scheme
3. According to Vygotsky, a child's _____ includes tasks that the child cannot do alone but can accomplish with the help of an adult or older child.
4. Information-processing theorists (expand on/contradict) Piaget's ideas about cognitive development.

CRITICAL THINKING

5. What are the pros and cons of educating parents and teachers about Piaget's stages of cognitive development? That is, to what extent might parents and educators who learn about Piaget's stages overestimate or underestimate children's abilities?

TABLE 2.6 Cognitive Theories

		Evaluation	
Theory	**Main Idea**	**Strengths**	**Weaknesses**
Piaget's theory of cognitive development	Reasoning develops in four universal stages from birth through adolescence; in each stage, the child builds a different kind of scheme.	Helps explain how children of different ages think about and act on the world.	Stage concept may cause adults to underestimate children's reasoning abilities; there may be additional stages in adulthood.
Information-processing theory	The computer is used as a model for human cognitive functioning; encoding, storage, and retrieval processes change with age, causing changes in memory function; these changes happen because of both brain maturation and practice.	Helps explain how much information people of different ages can manage at one time and how they process it; provides a useful framework for studying individual differences in people of the same age.	Human information processing is much more complex than that of a computer; the theory doesn't provide an overall picture of development.
Vygotsky's sociocultural theory	Emphasizes linguistic and social factors in cognitive development.	Incorporates group learning processes into explanations of individual cognitive development.	Insufficient evidence to support most ideas.

RESEARCH REPORT

Piaget's Clever Research

Piaget devised several creative strategies for testing children's cognitive development. Probably the most famous of all Piaget's clever techniques is his method for studying *conservation*, the understanding that matter does not change in quantity when its appearance changes. One of Piaget's best known problems is illustrated in Figure 2.1 on pg. 34. Piaget began by showing the child two containers with equal amounts of liquid. Next, he poured the contents of one of them into a new container of a different shape to determine whether children understood that the quantity of liquid remained the same regardless of its appearance. In a similar problem, Piaget began with two balls of clay of equal size; he showed them to a child and let the child hold and manipulate them until she agreed that they had the same amount of clay. Then in full view of the child, Piaget rolled one of the balls into a sausage shape. Then he asked the child whether there was still the same amount of clay in the sausage and the ball or whether one had more. Children of 4 and 5 consistently said that the ball contained more clay; children of 6 and 7 consistently said that the shapes still had the same amount. Thus, the older children understood that the quantity of clay was conserved even though its appearance changed.

In conversations with children about the problems he devised, Piaget was always trying to understand how the child thought rather than trying to see whether the child could come up with the right answer. So he used an investigative method in which he asked probing follow-up questions such as "How did you figure that out?" to discover the child's logic. In the early days of Piaget's work, many American researchers were critical of this method, since Piaget did not ask precisely the same questions of each child. Still, the results were so striking, and so surprising, that they couldn't be ignored. And when stricter research techniques were devised, more often than not, the investigators confirmed Piaget's observations.

CRITICAL ANALYSIS

1. ***To what extent were Piaget's methods influenced by children's language skills?***
2. ***How might older children's more highly developed capacity for reflecting on and explaining their thought processes have influenced Piaget's inferences about younger children's capacity for logical thinking?***

Biological and Ecological Theories

Theories that propose links between physiological processes and development represent one of the most important trends among developmentalists in the 21st century (Parke, 2004). Some of these theories focus on individual differences, while others deal with universal aspects of development. Moreover, all of them, to varying degrees, address the manner in which environmental factors interact with physiological processes.

Behavior Genetics

LO 2.12 How do behavior geneticists explain individual differences?

Behavior genetics focuses on the effect of heredity on individual differences. Traits or behaviors are believed to be influenced by genes when those of related people, such as children and their parents, are more similar than those of unrelated people. Behavior geneticists have shown that heredity affects a broad range of traits and behaviors, including intelligence, shyness, and aggressiveness.

Furthermore, the contributions of heredity to individual differences are evident throughout the lifespan. For example, researchers in the Netherlands have been studying a number of variables in identical and fraternal twins for several decades (Netherlands Twin Register, 2013). As you'll learn in Chapter 3, identical twins are particularly important in genetic research because they have exactly the same genes. As you can see in Figure 2.3, the Dutch researchers have found that IQ scores of identical twins are more strongly correlated than those of fraternal (nonidentical) twins from early childhood until middle age. Interestingly, too, such findings show that the environment affects IQ scores as well but that its effects may be transient. This conclusion is suggested by the fact that the IQ scores of fraternal twins are more strongly correlated in childhood, when they are living together, than in adulthood, when they do not share the same environment.

Behavior geneticists also study how individuals' genetic makeup influences the environments in which they are developing, a phenomenon that could occur via either or both of two routes. First, the child inherits his genes from his parents, who also create the environment in which he is growing up. So a child's genetic heritage may predict something about his environment. For example, parents who themselves have higher IQ scores are not only likely to

behavior genetics the study of the role of heredity in individual differences

pass their "good IQ" genes on to their children, they are also likely to create a richer, more stimulating environment for those children.

Second, each child's unique pattern of inherited qualities affects the way she behaves with other people, which in turn affects the way adults and other children respond to her. A cranky or temperamentally difficult baby may receive fewer smiles and more scolding than a placid, even-tempered one; a genetically brighter child may demand more personal attention, ask more questions, or seek out more complex toys than would a less bright child (Saudino & Plomin, 1997). Furthermore, children's interpretations of their experiences are affected by all their inherited tendencies, including not only intelligence but also temperament or pathology (Plomin, Reiss, Hetherington, & Howe, 1994).

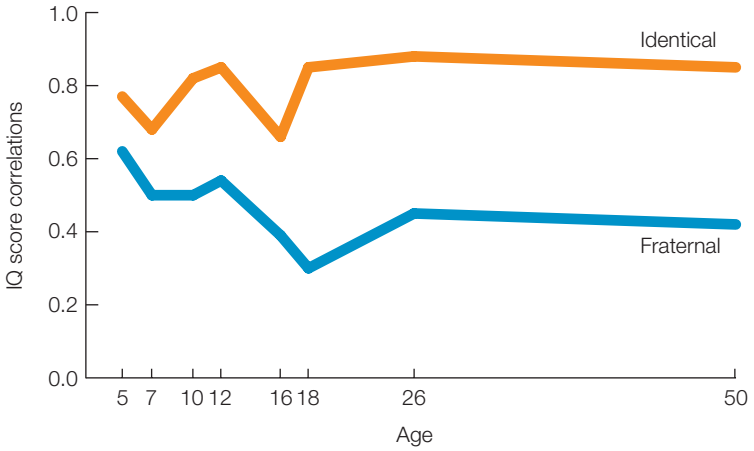


Figure 2.3 IQs of Fraternal and Identical Twins

This figure illustrates the combined findings of several longitudinal and cross-sectional studies of Dutch twins (Posthuma, de Geus, & Boomsma, 2003). You will notice that in childhood, when fraternal twins share the same environment, their IQ scores are more strongly correlated than in adulthood, when they presumably no longer live together. By contrast, the IQ scores of identical twins are even more strongly correlated in adulthood than during the childhood years. This pattern suggests conclusions about both heredity and environment. Specifically, at least with regard to IQ scores, the influence of heredity appears to increase with age, while that of the environment declines.

Ethology and Sociobiology

LO 2.13 What kinds of behaviors are of interest to ethologists and sociobiologists?

The relationship between individuals and the settings in which they develop is the emphasis of *ecological theories*—perspectives that view development as resulting from the degree to which genes help or hinder individuals' efforts to adapt to their environments. One such theory, known as **ethology**, focuses on the study of animals in their natural environments. Ethologists emphasize genetically determined survival behaviors that are assumed to have evolved through natural selection. For example, nests are necessary for the survival of young birds. Therefore, ethologists say, evolution has equipped birds with nest-building genes.

Likewise, the young of many species are vulnerable to predators. Consequently, their genes direct them to form a relationship with a more mature member of the species very early in life. One such relationship results from a process called *imprinting*, in which newborns of some species learn to recognize the characteristics of a protective organism within the first hours of life. Ethologist Konrad Lorenz (1903–1989) studied imprinting among animals extensively (Lorenz, 1935). He learned that young ducklings and geese, for example, imprint on any moving object to which they are exposed during the critical period for imprinting (24 to 48 hours after hatching). In fact, one of the best-known images in the field of ethology is that of Lorenz himself being followed by several goslings who had imprinted on him.

Similarly, ethologists believe that emotional relationships are necessary to the survival of human infants (Bowlby, 1969, 1980). They claim that evolution has produced genes that cause humans to form these relationships. For example, most people feel irritated when they hear a newborn crying. Ethologists say the baby is genetically programmed to cry in a certain way, and adults are genetically programmed to get irritated when they hear it. The caretaker responds to a crying baby's needs in order to remove the irritating stimulus of the noise. As the caretaker and infant interact, an emotional bond is created between them. Thus, genes for crying in an irritating manner increase infants' chances of survival.

Sociobiology is the study of society using the methods and concepts of biological science. When applied to human development, sociobiology emphasizes genes that aid group survival. Sociobiologists claim individual humans have the best chance for survival when they live in groups. Therefore, they claim, evolution has provided humans with genetic programming that helps us cooperate.

To support their views, sociobiologists look for social rules and behaviors that exist in all cultures. For example, every society has laws against murder. Sociobiologists believe that humans are genetically programmed to create rules based on respect for other people's lives. Evolution has selected these genes, they claim, because people need to respect each other's lives and to be able to cooperate.

ethology a perspective on development that emphasizes genetically determined survival behaviors presumed to have evolved through natural selection

sociobiology the study of society using the methods and concepts of biology; when used by developmentalists, an approach that emphasizes genes that aid group survival

Lorenz found that once a gaggle of newly hatched geese had imprinted on him, they followed him wherever he went.

Critics of ethology and sociobiology claim that these theories underestimate the impact of the environment. Moreover, these theories are difficult to test. How, for example, can researchers test ethological theorists' claim that infant–caregiver attachment is universal because it has survival value? Finally, critics say that these theories ignore the fact that societies invent ways of enhancing whatever behaviors might be influenced by universal genetic programming. For instance, as sociobiologists hypothesize, genes may be involved in the universal prohibition of murder, but societies invent strategies for preventing it. Moreover, these strategies differ across societies and in their effectiveness.

Bronfenbrenner's Bioecological Theory

LO 2.14 What is the main idea of Bronfenbrenner's bioecological theory?

bioecological theory Bronfenbrenner's theory that explains development in terms of relationships between individuals and their environments, or interconnected contexts

Another approach gaining interest in developmental psychology is that of Urie Bronfenbrenner (1917–2005). Bronfenbrenner's **bioecological theory** explains development in terms of relationships between people and their environments, or *contexts*, as Bronfenbrenner calls them (Bronfenbrenner, 1979, 1993). Bronfenbrenner attempted to classify all the individual and contextual variables that affect development and to specify how they interact.

According to Bronfenbrenner, the contexts of development are like circles within circles (see Figure 2.4). The outermost circle, the *macrosystem* (the cultural context), contains the values and beliefs of the culture in which a child is growing up. For example, a society's beliefs about the importance of education exist in the cultural context.

The next level, the *exosystem* (the socioeconomic context), includes the institutions of the culture that affect children's development indirectly. For example, funding for education exists in the socioeconomic context. The citizens of a specific nation may strongly believe that all children should be educated (cultural context), but their ability to provide universal education may be limited by the country's wealth (socioeconomic context).

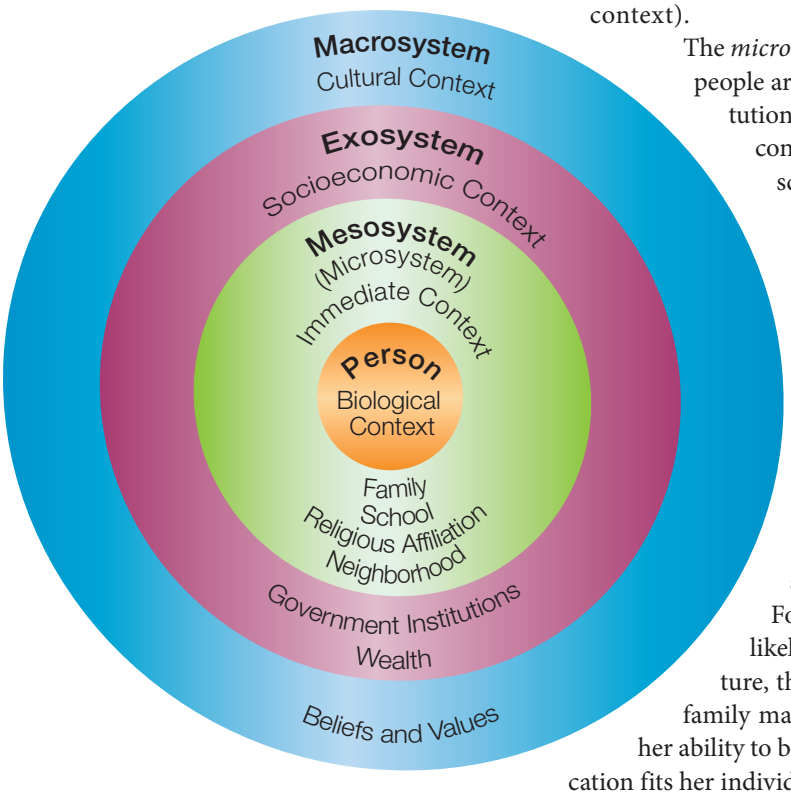


Figure 2.4 Bronfenbrenner's Contexts of Development

Bronfenbrenner's ecological theory proposes that people are exposed to interconnected contexts that interact in complex ways to influence development.

The *microsystem* (the immediate context) includes those variables to which people are exposed directly, such as their families, schools, religious institutions, and neighborhoods. The *mesosystem* is made up of the interconnections between these components. For example, the specific school a child attends and her own family are part of the microsystem. Her parents' involvement in her school and the response of the school to their involvement are part of the mesosystem. Thus, the culture a child is born into may strongly value quality education. Moreover, her nation's economy may provide ample funds for schooling. However, her own education will be more strongly affected by the particular school she attends and the connections—or lack thereof—between her school and her family. Thus, the child's immediate context may be either consistent with the cultural and socioeconomic contexts or at odds with them.

Finally, the child's genetic makeup and developmental stage—her *biological context*—also influence her development. For example, a student who hasn't mastered the skill of reading isn't likely to benefit from an enriched literature program. Thus, her culture, the socioeconomic situation, the school she attends, and her own family may all be geared toward providing a quality education. However, her ability to benefit from it will be determined by the degree to which her education fits her individual needs.

Bronfenbrenner's bioecological theory provides a way of thinking about development that captures the complexity of individual and contextual variables. To date, its greatest contribution to developmental psychology has been its emphasis on the need for research examining interactions among these variables (Lerner, Lewin-Bizan, & Warren, 2011).