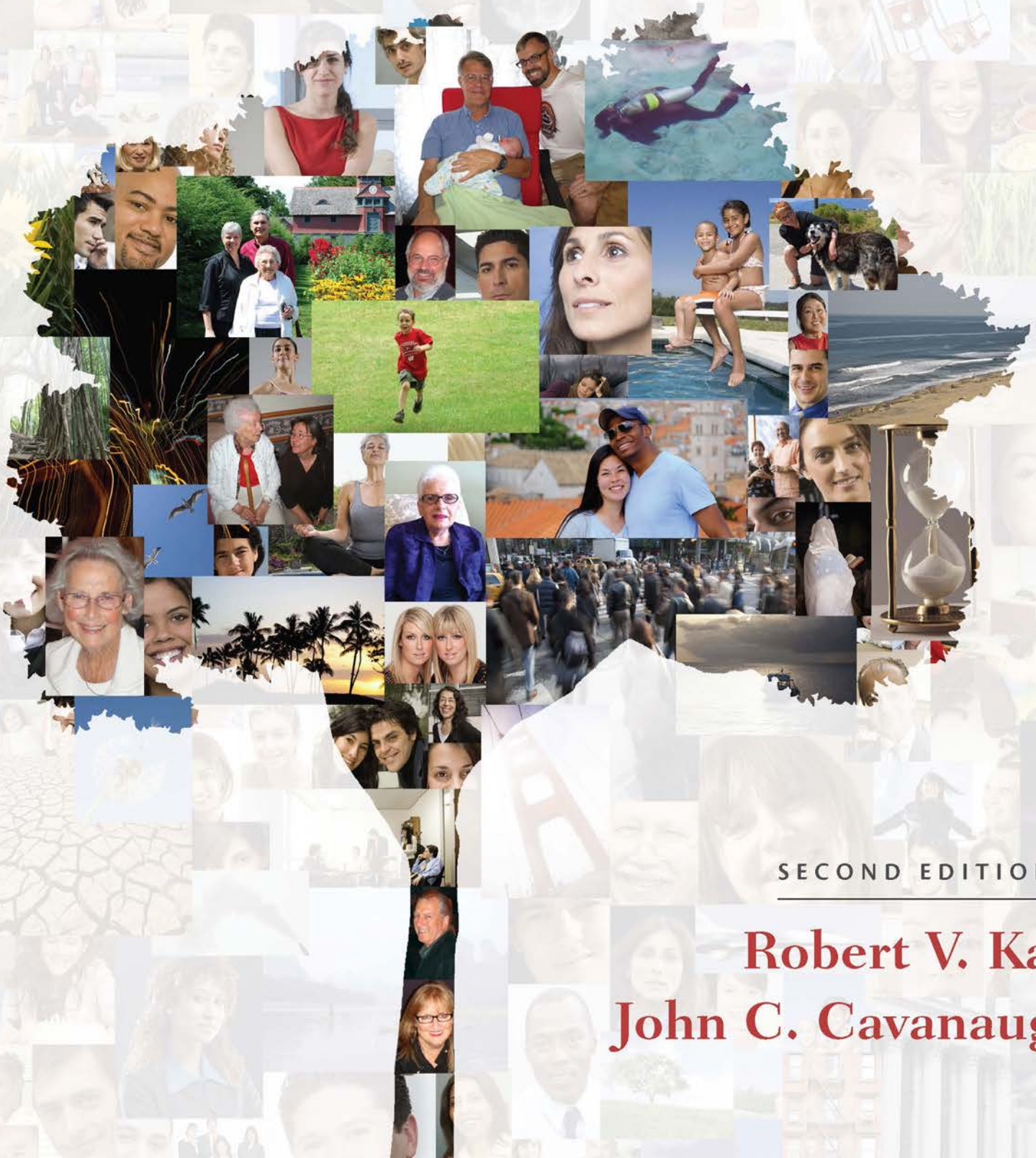
ESSENTIALS OF HUMAN DEVELOPMENT

A Life-Span View



SECOND EDITION

Robert V. Kail
John C. Cavanaugh

Second Edition

Essentials of Human Development

A Life-Span View

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Consortium of Universities of the Washington Metropolitan Area

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To Dea and Chris

Brief Contents

Second Edition

Essentials of Human Development

A Life-Span View

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Preface

Human development is the most fascinating and most complex science there is. Describing how people change (and how they stay the same) over their lives requires a multidisciplinary approach to fully capture the richness of the physical, intellectual, and social dimensions of development. Instructors often find it challenging to cover human development in the typical semester-long course. Consequently, we have created a focused text that emphasizes the essential, defining features of modern research and theory in human development. Specifically, *Essentials of Human Development: A Life-Span View*, Second Edition, fills the need for a shorter text that provides the following:

- A streamlined, readable account of human development across the life span
- Conceptual foundations that enable students to become educated and critical interpreters of developmental information
- An introduction to research and to the application of that research to important issues in life-span development

ORGANIZATION: A Modified Chronological Approach

Some human development texts take a chronological approach (focusing on functioning at specific stages of the life span, such as infancy, adolescence, and middle adulthood), but others use a topical approach (following a specific aspect of development, such as personality, throughout the life span). Both approaches have their merits, so we have combined them in a way that captures the best aspects of both. The overall organization of the text is chronological: We trace development from conception through late life in sequential order and dedicate several chapters to topical issues pertaining to particular points in the life span (infancy and early childhood, adolescence, young adulthood, middle adulthood, and late life).

But because the developmental continuity of such topics as social and cognitive development gets lost with narrowly defined, artificial age-stage divisions, we dedicate some chapters to tracing their development over larger segments of the life span. These chapters provide a more coherent description of important developmental changes, emphasize that development is not easily divided into "slices," and provide students with understandable explanations of developmental theories.

Balanced Coverage of the Entire Life Span

A primary difference between *Essentials of Human Development: A Life-Span View*, Second Edition, and similar texts is that this book provides a richer and more complete description of adult development and aging. Following the introductory chapter, the remaining 15 chapters of the text are evenly divided among childhood, adolescence, adulthood, and aging. This balanced treatment reflects not only the rapid emergence of adult development and aging as a major emphasis in the science of human development but also a recognition that roughly three fourths of a person's life occurs beyond adolescence.

As a reflection of our modified chronological approach, *Essentials of Human Development: A Life-Span View*, Second Edition, is divided into four main parts. After an introduction to the science of human development (Chapter 1), Part 1 includes a discussion of the biological foundations of life (Chapter 2) and development during infancy and early

childhood (Chapter 3 to 5). Part 2 focuses on development during middle childhood and adolescence (Chapter 6 to 9). Part 3 (Chapter 10 to 13) focuses on young and middle adulthood. Part 4 examines late adulthood (Chapter 14 and 15) and concludes with a consideration of dying and bereavement (Chapter 16).

CONTENT AND APPROACH: Biopsychosocial Emphasis

Our text provides comprehensive, up-to-date coverage of research and theory from conception to old age and death. We explicitly adopt the biopsychosocial framework as an organizing theme, describing it in depth in Chapter 1, and then integrating it throughout the text—often in combination with other developmental theories.

An Engaging Personal Style

On several occasions, we communicate our personal involvement with the issues being discussed by providing examples from our experiences as illustrations of how human development plays itself out in people's lives. In addition, every major section of a chapter opens with a short vignette, helping personalize a concept before it is discussed. Other rich examples are integrated throughout the text narrative and showcased in the Real People feature in nearly every chapter.

Emphasis on Inclusiveness

In content coverage, in the personalized examples used, and in the photos displayed, we emphasize diversity—within the United States and around the world—in ethnicity, gender, race, age, ability, and sexual orientation.

Appreciation of the Diverse Career Goals of Students

Students often study human development because they're pursuing a career related to health and human sciences, be it as a nurse, physician, educator, psychologist, social worker, or speech-language therapist. These students are often eager to see how human development research can allow them to work more effectively with future patients, students, or clients. Consequently, *Essentials of Human Development: A Life-Span View* emphasizes the application of human development research across diverse professional settings. *Human Development in Action* features (in the margins) encourage students to imagine themselves in a specific professional setting and to apply knowledge of human development to a specific problem. Similarly, *Apply* questions at the end of every section ask students to use material presented in that section to solve a problem facing a professional in the health and human sciences. Thus, this book consistently underscores the utility of research and theory in human development for improving the human condition.

Changes in the Second Edition

The second edition has been updated with new graphics and hundreds of new reference citations to work from the past 3 years. Of particular note are the following content additions, updates, and revisions.

Chapter 1 includes a new Spotlight on Research feature about the stability of intelligence from childhood to late life. This provides the opportunity to discuss research methods and how key human characteristics change or remain the same across the life span.

Chapter 2 includes extensively revised coverage of molecular genetics and a new Spotlight on Research feature on links between maternal depression and children's behavior.

Chapter 3 includes a new Spotlight on Research feature on infants' grasping as well revised coverage of infants' face perception and theory of mind.

Chapter 4 includes new material on young children's understanding of robots and ways to help young children pay attention more effectively; there is also a new Spotlight on Research feature on the impact of parents' speech on language learning.

Chapter 5 contains a new Spotlight on Research feature on gender along with new material on children's play with pets, on the influence of oxytocin on prosocial behavior, and on gender differences in memory and effortful control.

Chapter 6 features much revised coverage of gifted children and children with attention-deficit hyperactivity disorder (ADHD) as well as a new Spotlight on Research feature on ways to make tests less threatening.

Chapter 7 includes new material on spanking and on genetic influences on parenting along with much revised coverage of prejudice and of the influence of computers.

Chapter 8 has much revised coverage of the impact of pubertal timing and the factors that contribute to obesity; it also has a new Spotlight on Research feature on programs for preventing eating disorders.

Chapter 9 contains revised coverage of dating violence including a new Spotlight on Research feature.

Chapter 10 has a new Linking Research to Life feature on sexual assault on college campuses and a new Real People feature about Lorde.

Chapter 11 contains a new discussion about online dating as well as the hookup culture, updated material on same-sex marriage, and a reorganized parenting section.

Chapter 12 includes a new discussion about Sheryl Sandberg's concept of women "leaning in" and a new section on occupational expectations along with restructured discussions of occupational choice and career development.

Chapter 13 includes a new Spotlight on Research feature about designing software for middle-aged and older nonexperts, as well as new discussions on mindfulness-based stress reduction techniques and midlife correction as part of personality development.

Chapter 14 features a revised and restructured section on biological theories about aging, new discussions about chronic diseases such as diabetes, expanded discussions about genetics and biomarkers of Alzheimer's disease, and a new discussion about chronic traumatic encephalopathy.

Chapter 15 has a new Real People feature about Pete Seeger, an expanded Linking Research to life feature about reforming Social Security and Medicare, and a new Spotlight on Research feature about the costs of holding in grief for the sake of one's partner.

Chapter 16 includes a new Linking Research to Life feature about Brittany Maynard and the death with dignity debate, a discussion about new ways of diagnosing persistent vegetative state, and a New Real People feature about Randy Pausch's last lecture.

PEDAGOGICAL FEATURES

Among the most important aspects of *Essentials of Human Development: A Life-Span View* is its exceptional integration of pedagogical features, designed to help students maximize their learning. Features that are normally set apart are woven seamlessly into the narrative. This unrivaled integration is meant to help students stay focused on a seamless presentation of human development across the life span.

- **SPOTLIGHT ON RESEARCH** features emphasize a fuller understanding of the science and scope of life-span development.
- **REAL PEOPLE: APPLYING HUMAN DEVELOPMENT** features illustrate the everyday applications of life-span development issues.
- **LINKING RESEARCH TO LIFE** features show how findings from research can be used to improve human development throughout the life span.

- *Learning Objectives*, followed by brief *vignettes*, open the major sections in each chapter. Each major section is numbered for easy assignment and to help students visually organize the material.
- **HUMAN DEVELOPMENT IN ACTION** questions in the margins encourage application of research to real problems in professional settings.
- *Test Yourself* questions at the end of major sections reinforce key concepts discussed in the section.
- A bulleted *Summary*, organized around the chapter's learning objectives within each major section, ends each chapter.

In sum, we believe that our integrated pedagogical system gives students all the tools they need to comprehend the material and study for tests.

MINDTAP FOR *ESSENTIALS OF HUMAN DEVELOPMENT*

MindTap for *Essentials of Human Development* engages and empowers students to produce their best work—consistently. By seamlessly integrating course material with videos, activities, apps, and much more, MindTap creates a unique learning path that fosters increased comprehension and efficiency.
For students:

- MindTap delivers real-world relevance with activities and assignments that help students build critical thinking and analytic skills that will transfer to other courses and their professional lives.
- MindTap helps students stay organized and efficient with a single destination that reflects what's important to the instructor, along with the tools students need to master the content.
- MindTap empowers and motivates students with information that shows where they stand at all times—both individually and compared to the highest performers in class.

Additionally, for instructors, MindTap allows you to:

- Control what content students see and when they see it with a learning path that can be used as-is or matched to your syllabus exactly.
- Create a unique learning path of relevant readings and multimedia and activities that move students up the learning taxonomy from basic knowledge and comprehension to analysis, application, and critical thinking.
- Integrate your own content into the MindTap Reader using your own documents or pulling from sources like RSS feeds, YouTube videos, websites, Google Docs, and more.
- Use powerful analytics and reports that provide a snapshot of class progress, time in course, engagement, and completion.

In addition to the benefits of the platform, MindTap for *Essentials of Human Development* includes:

- Investigate Development, a case-based simulation that enables students to observe, evaluate, and make decisions about human development and shows the implications of research on a personal level. Students interact with simulated case studies of milestones in a person's development, observing and analyzing audio-visual cues, consulting research, and making decisions. Instead of rote memorization of isolated concepts, Investigate Development compels students to think critically about research and brings human development to life.
- Formative assessments at the conclusion of each chapter.
- Interactive activities drawn from text features that foster student participation.
- Illustrative video embedded in the MindTap Reader to highlight key concepts for students.

SUPPLEMENTARY MATERIALS: Online Instructor's Resource Manual

The *Instructor's Resource Manual* contains resources designed to streamline and maximize the effectiveness of course preparation. The contents include chapter overviews and outlines, learning objectives, critical thinking discussion questions, instructional goals, lecture expanders, video recommendations, and handouts.

Cengage Learning Testing Powered by Cognero

Cognero is a flexible, online system that allows you to author, edit, and manage test bank content as well as create multiple test versions in an instant. You can deliver tests from your school's learning management system, your classroom, or wherever you want. The test bank contains multiple-choice, completion, true/false, and essay questions for each chapter.

Online PowerPoint

These vibrant Microsoft® PowerPoint® lecture slides for each chapter assist you with your lecture by providing concept coverage using content directly from the textbook.

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Reviewers

We also thank the many reviewers who generously gave their time and effort to help us sharpen our thinking about human development and, in doing so, shaped the development of this text:

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To the Student

Essentials of Human Development: A Life-Span View, Second Edition, is written with you, the student, in mind. In the next few pages, we describe several features of the book that make it easier for you to learn. Please don't skip this material; it will save you time in the long run.

Learning and Study Aids

Each chapter includes several distinctive features to help you learn the material and organize your studying:

- Each chapter opens with a detailed outline and an overview of the main topics.
- Each major section within a chapter begins with a set of learning objectives. There is also a brief vignette introducing one of the topics to be covered in that section and providing an example of the developmental issues people face.
- When key terms are introduced in the text, they appear in bold type and are defined in the margins. This should make key terms easy to find and learn.
- Key developmental theories are introduced in Chapter 1 and are referred to throughout the text.
- *Human Development in Action* questions appear in the margins. These are designed to help you apply information from the text to problems that you might encounter as a professional in health, human sciences, or education.
- The end of each section includes a feature called *Test Yourself*, which will help you check your knowledge of major ideas you just read about. The *Test Yourself* questions serve two purposes. First, they give you a chance to spot-check your understanding of the material. Second, the questions relate the material you just read to other facts, theories, or the biopsychosocial framework you read about earlier.
- Text features that expand or highlight a specific topic are integrated with the rest of the material. This book includes the following three features, each identified by a distinctive icon:
  - **SPOTLIGHT ON RESEARCH** features elaborate on specific research studies discussed in the text and provide more details on the design and methods used.
  - **REAL PEOPLE: APPLYING HUMAN DEVELOPMENT** features present case studies that illustrate how issues in human development discussed in the chapter are manifested in the lives of real people.
  - **LINKING RESEARCH TO LIFE** features show how findings from research relate directly to real issues or problems facing people at different phases in their lives.
- The end of each chapter includes two special study tools. A *Summary*, organized by learning objective within major section headings, provides a review of the key ideas in the chapter. Next is a list of *Key Terms* that appear in the chapter.

We strongly encourage you to take advantage of these learning and study aids as you read the book. We also left room in the margins for you to make notes on the material so that you can more easily integrate the text with your class and lecture material.

Tips on How to Use this Book

Your instructor will probably assign about one chapter per week. Don't try to read an entire chapter in one sitting. Instead, on the first day, preview the chapter. Read the

introduction and notice how the chapter fits into the entire book; next, page through the chapter, reading the learning objectives, vignettes, and major headings. Also read the italicized sentences and the boldfaced terms. Your goal is to get a general overview of the entire chapter—a sense of what it's all about.

Now you're ready to begin reading. Go to the first major section and preview it again, reminding yourself of the topics covered. Then start to read. As you read, think about what you're reading. Every few paragraphs, stop briefly. Try to summarize the main ideas in your own words, ask yourself whether the ideas describe your experiences or those of others you know, or tell a friend about something interesting in the material. In other words, read actively—get involved in what you're reading. Don't just stare glassy-eyed at the page!

Continue this pattern—reading, summarizing, and thinking—until you finish the section. Then answer the *Test Yourself* questions to determine how well you've learned what you've read. If you've followed the read–summarize–think cycle as you worked your way through the section, you should be able to answer most of the questions.

The next time you sit down to read (preferably the next day), start by reviewing the second major section. Then complete it with the read–summarize–think cycle. Repeat this procedure for all major sections.

When you've finished the last major section, wait a day or two and then review each major section. Pay careful attention to the italicized sentences, the boldfaced terms, and the *Test Yourself* questions. Also, use the study aids at the end of the chapter to help you integrate the ideas in the chapters.

With this approach, it should take several 30- to 45-minute study sessions to complete each chapter. Don't be tempted to rush through an entire chapter in a single session. Research consistently shows that you learn more effectively by having daily (or nearly daily) study sessions devoted to both reviewing familiar material and taking on a relatively small amount of new material.

Terminology

A few words about terminology before we embark. Certain terms are used to refer to different periods of the life span. Although you may already be familiar with the terms, here we clarify how they are used in this text. The following terms refer to a specific range of ages:

Newborn: birth to 1 month
Infant: 1 month to 1 year
Toddler: 1 to 2 years
Preschooler: 2 to 6 years
School-age child: 6 to 12 years
Adolescent: 12 to 20 years
Young adult: 20 to 40 years
Middle-aged adult: 40 to 60 years
Young-older adult: 60 to 80 years
Old-old adult: 80 years and beyond

Sometimes, for variety, we use other terms that are less tied to specific ages, such as babies, youngsters, and older adults. However, you will be able to determine the specific ages from the context.

Organization

To organize the material into meaningful segments across the life span, *Essentials of Human Development: A Life-Span View*, Second Edition, is divided into four parts: Prenatal Development, Infancy, and Early Childhood; School-Age Children and Adolescents; Young and Middle Adulthood; and Late Adulthood. We believe this organization achieves two major goals. First, it divides the life span in ways that relate to the divisions

encountered in everyday life. Second, it enables us to provide a more complete account of adulthood than other books do.

Because some developmental issues pertain only to a specific point in the life span, some chapters are organized around specific ages. Overall, the text begins with conception and proceeds through childhood, adolescence, adulthood, and old age to death. But because some developmental processes unfold over longer periods, some chapters are organized around specific topics.

Part 1 covers prenatal development, infancy, and early childhood. Here we see how genetic inheritance operates and how the prenatal environment affects a person's future development. During the first 2 years of life, the rate of change in both motor and perceptual arenas is amazing. How young children acquire language and begin to think about their world is as intriguing as it is rapid. Early childhood also marks the emergence of social relationships, as well as an understanding of gender roles and identity. By the end of this period, a child is reasonably proficient as a thinker, uses language in sophisticated ways, and is ready for the major transition into formal education.

Part 2 covers the years from elementary school through high school. In middle childhood and adolescence, the cognitive skills formed earlier in life evolve to adultlike levels in many areas. Family and peer relationships expand. During adolescence, there is increased attention to work and sexuality emerges. The young person begins to learn how to face difficult issues in life. By the end of this period, a person is on the verge of legal adulthood. The typical individual uses logic and has been introduced to most issues that adults face.

Part 3 covers young adulthood and middle age. During this period, most people achieve their most advanced modes of thinking, reach peak physical performance, form intimate relationships, start families of their own, begin and advance within their occupations, balance many conflicting roles, and begin to confront aging. Over these years, many people go from breaking away from their families to having their children break away from them. Relationships with parents are redefined, and the pressures of being caught between the younger and the older generations are felt. By the end of this period, most people have shifted focus from time since birth to time until death.

Part 4 covers the last decades of life. The biological, physical, cognitive, and social changes associated with aging become apparent. Although many changes reflect decline, many other aspects of old age represent positive elements: wisdom, retirement, friendships, and family relationships. We conclude this section, and the text, with a discussion of the end of life. Through our consideration of death, you will gain additional insights into the meaning of life and human development.

We hope the organization and learning features of the text are helpful to you—making it easier for you to learn about human development. After all, this book tells the story of people's lives, and understanding the story is what it's all about.

About the Authors

ROBERT V. KAIL is Distinguished Professor of Psychological Sciences at Purdue University. His undergraduate degree is from Ohio Wesleyan University, and his Ph.D. is from the University of Michigan. Kail is editor of *Child Development Perspectives*. He received the McCandless Young Scientist Award from the American Psychological Association, was named the Distinguished Sesquicentennial Alumnus in Psychology by Ohio Wesleyan University, and is a fellow of the Association for Psychological Science. Kail has also written *Children and Their Development* and *Scientific Writing for Psychology: Lessons in Clarity and Style*. His research focuses on cognitive development during childhood and adolescence. Away from the office, he enjoys photography and working out.

JOHN C. CAVANAUGH is President and CEO of the Consortium of Universities of the Washington Metropolitan Area. He received his undergraduate degree from the University of Delaware and his Ph.D. from the University of Notre Dame. Cavanaugh is a fellow of the American Psychological Association (APA), the Association for Psychological Science, and the Gerontological Society of America, and he has served as president of the Adult Development and Aging Division (Division 20) of the APA. Cavanaugh has also written (with the late Fredda Blanchard-Fields) *Adult Development and Aging*. His research interests in gerontology concern family caregiving as well as the role of beliefs in older adults' cognitive performance. He enjoys backpacking, cooking, and landscape photography and is an avowed chocoholic.

Second Edition

Essentials of Human Development

A Life-Span View

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The Study of Human Development

1

Jeanne Calment was one of the most important people to have ever lived. Her achievement was not made in any profession. When she died in 1996 at an age of 122 years and 164 days, she set the world record for the longest verified human life span. Jeanne lived her whole life in Arles, France. She met Vincent Van Gogh and experienced the invention of the lightbulb, automobiles, airplanes, space travel, computers, and all sorts of everyday conveniences. Jeanne was extraordinarily healthy her whole life, hardly ever being ill. She was also active; she learned fencing when she was 85, and she was still riding a bicycle at age 100. She lived on her own until she was 110. Shortly before her 121st birthday, Music Disc released *Time's Mistress*, a CD of Jeanne speaking over a background of rap and hip-hop music.

Later in this chapter in the Linking Research to Life feature, we will pose the question of whether you want to live as long as Jeanne did. Reflecting on this question is a good way to prepare for the issues we will confront in this course. For example, think about how you changed from being a young child to the person you are now. Or think about what you might experience over the next few years or decades. Take a moment and write down—or share with someone else—your fondest memories from childhood or the events and people who have most influenced you. Also make a note about what you hope some memorable events will be in your future. (Then, many years from now, retrieve it and see whether these events occurred.)

Georges GOBET Agence France Presse/Newscom

Jeanne Calment experienced many changes in society during her 122-year life span.

In this course, you will have the opportunity to ask some of life's most basic questions: How did your life begin? How did you go from a single cell—about the size of the period at the end of a sentence in this text—to the fully grown, complex adult person you are today? Will you be the same or different by the time you reach late life? How do you influence other people's lives? How do they influence yours? How do the various roles you may have throughout life—child, teenager, partner, spouse, parent, worker, grandparent—shape your development? How will you deal with your own and others' deaths?

These are examples of the questions that create the scientific foundation of **human development**, *the multidisciplinary study of how people change and how they remain the same over time*. Answering these questions requires us to draw on theories and research in the physical and social sciences. The science of human development reflects the complexity and uniqueness of each person and each person's experiences, as well as commonalities and patterns across people.

In this chapter, we go over the basics: theories, common issues and influences on development, and methods developmentalists use to make discoveries.

1.1 Thinking About Development

Learning Objectives

- What fundamental issues of development have scholars addressed throughout history?
- What are the basic forces in the biopsychosocial framework? How does the timing of these forces affect their impact?
- How does neuroscience enhance our understanding of human development?

human development
the multidisciplinary study of how people change and how they remain the same over time

Javier Suarez smiled broadly as he held his newborn grandson for the first time. So many thoughts rushed into his mind–What would Ricardo experience growing up? Would the poor neighborhood they live in prevent him from reaching his potential? Would the family genes for good health be passed on? How would Ricardo's life growing up as a Latino in the United States be different from Javier's own experiences in Mexico?

Like many grandparents, Javier wonders what the future holds for his grandson. The questions he asks relate to general issues of human development that have intrigued philosophers and scientists for centuries. Let's see what these issues are.

Recurring Issues in Human Development

What factors have shaped your life until now? Your genetic heritage, your family or neighborhood, the suddenness of some changes in your life and the gradualness of others, and the culture or cultures in which you grew up or now live might be among the influences. Everyone's life is shaped by a complex set of factors.

Your speculations capture three pairs of fundamental characteristics of human development: nature and nurture, continuity and discontinuity, and universal and context-specific development. A person's development is a blend of these characteristics; for example, some of your characteristics remain the same through life (continuity), and others change (discontinuity). Let's examine each pair of characteristics.

Nature and Nurture

Think for a minute about a particular feature that you and several people in your family have, such as intelligence, good looks, or a friendly and outgoing personality. Why is this feature so prevalent? Did you inherit it? Or is it mainly because of where and how you were brought up? *Answers to these questions illustrate different positions on the* **nature–nurture issue**, *which involves the degree to which genetic or hereditary influences (nature) and experiential or environmental influences (nurture) determine the kind of person you are*. The key point is that development is always shaped by both.

A major aim of human development research is to understand how heredity and environment jointly determine development. For Javier, the new grandparent at the opening of this section, it means his grandson's development will be shaped both by the genes he inherited and by the experiences he will have.

Human Development *in Action*

Think of some careers, such as professional athlete, computer company manager, and artist. How do nature and nurture influence behaviors you consider typical for people who excel in these careers?

Continuity and Discontinuity

Do you think that you've not changed very much since you were a young child? This view suggests continuity in development: once a person begins down a particular developmental path—for example, toward friendliness or intelligence—he or she tends to stay on that path throughout life.

Another view—that development is discontinuous—is illustrated when individuals change in some significant way. A common example is when toddlers go through what people refer to as the "Terrible Twos," seemingly going from being sweet and cooperative to assertive and demanding. In this view, people can change from one developmental path to another, perhaps several times in their lives.

The **continuity–discontinuity issue** *concerns whether a particular developmental phenomenon represents a smooth progression throughout life (continuity) or a series of abrupt shifts (discontinuity)*. Throughout this book, you will find examples of developmental changes that represent continuities and others that are discontinuities.

nature–nurture issue
the degree to which genetic or hereditary influences (nature) and experiential or environmental influences (nurture) determine the kind of person you are

continuity–discontinuity issue
whether a particular developmental phenomenon represents a smooth progression throughout the life span (continuity) or a series of abrupt shifts (discontinuity)

universal versus context-specific development issue
whether there is just one path of development or several paths

Universal and Context-Specific Development

In many native and indigenous cultures, mathematical concepts are mastered by young children not through formal education about numbers but in the context of real-life tasks such as picking berries and selling goods in street markets (Kisker et al., 2012). In contrast, 10- to 12-year-olds in the United States are formally taught at home or school to identify numbers and to perform the arithmetic needed to handle these tasks. Can one theory explain development in both groups of children? *The* **universal versus context-specific development issue** *concerns whether there is just one path of development or several paths*.

Some theorists argue that, despite what look like differences in development, most people worldwide follow a similar developmental path. The alternative view argues

Jan Csernoch/Alamy

Even with little formal education, this boy has well-developed mathematical skills, an example of cultural context forces on development.

that human development is inextricably intertwined with the context within which it occurs. In this view, a person's development is a product of complex interaction with the environment, and that interaction is not fundamentally the same in all environments. Each environment has its own set of unique procedures that shape development.

Basic Forces in Human Development: The Biopsychosocial Framework

When trying to explain why people develop as they do, scientists usually consider four interactive forces that affect development:

- *Biological forces* that include all genetic and health-related factors
- *Psychological forces* that include all internal cognitive, emotional, perceptual, and personality factors
- *Sociocultural forces* that include interpersonal, societal, cultural, and ethnic factors
- *Life-cycle forces* that reflect differences in how the same event affects people of different ages

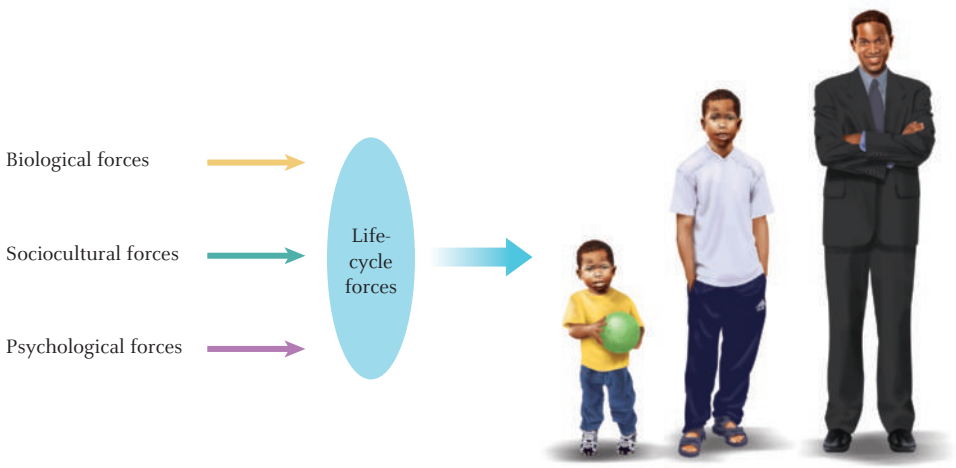
Each person is a unique combination of these forces. To see why each force is important, think about a mother deciding whether she should breastfeed her infant. Her decision is based on biological variables (e.g., the quality and amount of milk she produces), her attitudes about the virtues of breastfeeding, the influences of other people (e.g., the father), and her cultural traditions about appropriate ways to feed infants. In addition, her decision reflects her age and stage of life. Only by focusing on all of these forces can we have a complete view of the mother's decision.

A useful way to organize the biological, psychological, and sociocultural forces on human development is with the **biopsychosocial framework**. As you can see in ◗ Figure 1.1, the biopsychosocial framework emphasizes that each of the forces interacts with the others to make up development. Let's look at the different elements of the biopsychosocial model in more detail.

biopsychosocial framework
a useful way to organize the biological, psychological, and sociocultural forces on human development

Biological Forces: Genetics and Health

Prenatal development, brain maturation, puberty, and menopause are examples of biological forces determined by our genetic code. But biological forces also include the effects of lifestyle factors, such as diet and exercise. Collectively, biological forces provide the raw material necessary and set the boundary conditions for development.



◗ **Figure 1.1**

The biopsychosocial framework shows that human development results from interacting forces.

Psychological Forces: Known by Our Behavior

Psychological forces seem familiar because they are the ones used most often to describe the characteristics of a person. For example, think about how you describe yourself to others: intelligent, honest, self-confident, and so on. Concepts like these reflect psychological forces.

In general, psychological forces are all internal cognitive, emotional, personality, perceptual, and related factors that influence behavior. Much of what we discuss throughout this text reflects psychological forces.

Sociocultural Forces: Race, Ethnicity, and Culture

People develop in the world, not in a vacuum. To understand human development, we need to view an individual's development as part of a larger system in which no individual part can act without influencing all other aspects of the system. This larger system includes an individual's parents, children, and siblings, as well as important people outside the family, such as friends, teachers, and co-workers. The system also includes institutions that influence development, such as schools, television, and the workplace. At a broader level, the society in which a person grows up plays a key role.

738248956l /Shutterstock.com

The culture in which you grow up influences how you experience life.

All of these people and institutions fit together to form a person's culture: the knowledge, attitudes, and behavior associated with a group of people. Culture can be linked to a particular country or people (e.g., French culture), to a specific point in time (e.g., popular culture of the 2010s), or to groups of individuals who maintain specific, identifiable cultural traditions (e.g., Mexican Americans). Knowing the culture from which a person comes provides some general information about important influences that become manifest throughout the life span.

Life-Cycle Forces: Timing Is Everything

Consider the following two females. Jacqui, a 32-year-old, has been happily married for 6 years. She and her husband have a steady income. They decide to start a family, and three months later Jacqui learns she is pregnant. Jenny, a 16-year-old, lives in the same neighborhood as Jacqui. She has been sexually active for about 6 months but is not in a stable relationship. After missing her period, Jenny takes a pregnancy test and discovers that she is pregnant.

Although both Jacqui and Jenny have become pregnant, the impact and outcome of each pregnancy will be affected by factors in each woman's situation, such as her age, her financial situation, and the extent of her social support systems. The example illustrates life-cycle forces: The same event can have different effects depending on when it happens in a person's life.

The Forces Interact

We've described the four forces in the biopsychosocial framework as if they were independent, but in reality each force shapes the others. No aspect of human development can be fully understood by examining the forces in isolation. All four must be considered in interaction.

Combining the four developmental forces gives a view of human development that encompasses the life span yet appreciates the unique aspects of each phase of life. From this perspective we can view each life story as a complex interplay among the four forces. Try this for yourself. Read the short biography of Nelson Mandela in the Real People: Applying Human Development feature; then, think about how each of the developmental forces would explain how he accomplished as much as he did.

*real*People

APPLYING HUMAN DEVELOPMENT

Nelson Mandela

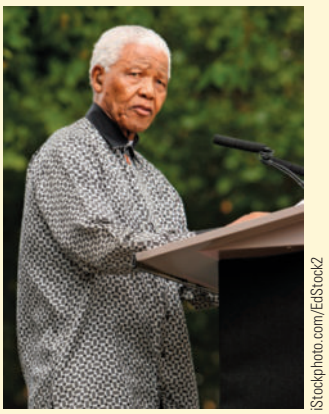
Few people have the breadth of lifetime experiences or the impact on their native country that Nelson Mandela did. Born on July 18, 1918, Mandela was the first member of his family to attend a school, and he earned a bachelor's degree at the University of South Africa. In 1948, he began his political career by opposing the Afrikaner-dominated National Party, which supported the apartheid policy of racial segregation. It was a decision that changed his life.

Mandela was initially dedicated to nonviolent opposition and was influenced by Mahatma Gandhi, who had begun his efforts at social activism in South Africa years earlier. However, after Mandela's arrest for treason in 1956 and his subsequent trial (he was acquitted), he changed his view about nonviolent opposition. The Sharpeville Massacre in 1960, in which 69 peaceful protesters were killed by South African police, convinced him that armed struggle was necessary to overthrow the apartheid government. So in 1961, he formed the armed wing of the African National Congress and began a guerrilla campaign of sabotage against military and government targets.

Mandela was arrested again in 1962. This time he was convicted of sabotage and treason and sentenced to life imprisonment. He remained in jail until February 11, 1990, when he was released by President F. W. de Klerk. During a speech immediately after his release, Mandela said that his main focus was to bring peace to the black majority and give them the right to vote in both national and local elections. Between 1990 and 1994, he negotiated the first multiracial elections in South Africa's history.

Mandela was elected president and served from 1994 to 1999. He helped the country move from white minority apartheid rule to a multiracial model of government built on reconciliation. His support of the Springboks rugby team that won the 1996 world title was especially important and was the subject of the 2009 film *Invictus*.

After Mandela retired in 1999, he remained politically active. He became an advocate for human rights organizations and in the fight against AIDS. He founded three organizations: the Nelson Mandela Foundation, the Nelson Mandela Children's Fund, and the Mandela Rhodes Foundation.



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Nelson Mandela

Nelson Mandela was a true world leader, a person who reshaped the history of his country. He showed continuity in his life through political activity, perseverance through great hardships, and finding a balance between his personal competence and the challenges he experienced during his life. At his death in 2013, he was remembered for his unique ability to keep the focus on his cause—justice—while moving from a very activist approach to one emphasizing healing and trust.

Neuroscience: A Window Into Human Development

Understanding that the four developmental forces interact is one thing. But what if you could actually see these forces interact? That's what is possible in the field of neuroscience. *Applied to human development*, **neuroscience** *is the study of the brain and nervous system, especially in terms of brain–behavior relationships*. Neuroscientists use a variety of methods to study brain–behavior relationships, from molecular analyses of individual brain cells to sophisticated brain imaging techniques.

Neuroscientific approaches are being applied to a range of issues in human development, especially those involving memory, reasoning, and emotion (Schneider, 2014). For example, neuroscientists are beginning to unlock relationships among developmental changes in specific regions of the brain to explain developmental phenomena such as adolescents' tendency to engage in risky behavior and older adults' short-term memory problems.

Neuroscience brings an important perspective to human development that reveals interactions among biological, psychological, sociocultural, and life-cycle forces, allowing a better understanding of how each person is a unique expression of these forces.

neuroscience
the study of the brain and nervous system, especially in terms of brain–behavior relationships

TEST Yourself

➤ Recall

1. The nature–nurture issue involves the degree to which _____ and environment influence human development.
2. Azar remarked that her 14-year-old son is incredibly shy and has been so ever since he was a baby. This illustrates the _____ of development.
3. _____ forces include genetic and health factors.
4. Neuroscience examines _____ relationships.

➤ Interpret

- How does the biopsychosocial framework provide insight into the recurring issues of development (nature–nurture, continuity–discontinuity, and universal–context-specific)?
- How would you explain criminal behavior and suggest ways to prevent it from both a nature and a nurture perspective?

➤ Apply

- How does your life experience reflect the four developmental forces?
- How does understanding the forces underlying human development help you interpret people's behavior in your workplace?

Recall answers: (1) genetics, (2) continuity, (3) Biological, (4) brain–behavior

1.2 Developmental Theories

Learning Objectives

- What is a developmental theory?
- How do psychodynamic theories account for development?
- What is the focus of the learning theories of development?
- How do cognitive-developmental theories explain changes in thinking?
- What are the main points in the ecological and systems approach?
- What are the major tenets of the life-span and the life-course theories?

Marcus has just graduated from high school, first in his class. For his proud mother, Betty, this is a time to reflect on her son's past and to ponder his future. Marcus has always been a happy, easygoing child–a joy to rear. And he's constantly been interested in learning. Betty wonders why he is so perpetually good natured and so curious. If she knew the secret, she likes to say with a laugh, she could write a best-selling book and be a guest on *The Tonight Show.*

To answer Betty's questions about her son's growth, developmental researchers need a theory of his development. Theories are essential because they provide the whys for development. *In human development, a* **theory** *is an organized set of ideas that is designed to explain development*. For example, suppose two of your friends wonder why their baby cries often. Maybe the baby cries because she's hungry; maybe she cries to get her parents to hold her; maybe she cries because she's an unhappy baby. Each of these explanations is a simple theory: It tries to explain why the baby cries so much. Actual theories in human development are more complicated, but the purpose is the same—to explain behavior and development.

theory
an organized set of ideas that is designed to explain development

There are no comprehensive theories of human development to guide research (Newman & Newman, 2007). Instead, five general perspectives influence current research: psychodynamic theory; learning theory; cognitive-developmental theory; ecological and systems theory; and theories involving the life-span perspective, selective optimization with compensation, and the life-course perspective. Let's consider each approach briefly.

Psychodynamic Theory

Psychodynamic theories *hold that development is largely determined by how well people resolve conflicts they face at different ages*. This perspective began with Sigmund Freud's theory that personality emerges from conflicts that children experience between what they want to do and what society wants them to do. Erik Erikson (1902–1994) elaborated on this idea in proposing his psychosocial theory, which was the first comprehensive life-span theory and remains an important theoretical framework.

Erikson's Theory

In his **psychosocial theory**, *Erikson proposed that personality development is determined by the interaction of an internal maturational plan and external societal demands*. He proposed that the life cycle is composed of eight stages (shown in ■ Table 1.1) and that the order of the stages is biologically fixed. The name of each stage reflects the challenge people face at a particular age. Challenges are met through a combination of inner psychological influences and outer social influences. When people meet challenges successfully, they are well prepared to meet the challenge of the next stage.

The sequence of stages in Erikson's theory is based on the **epigenetic principle**, *which means that each psychosocial strength has its own period of particular importance*. The eight stages represent the order of this ascendancy. It takes a lifetime to acquire all of the psychosocial strengths. Moreover, later stages are built on the foundation laid in previous stages.

Bettmann/Corbis

Erik Erikson

Learning Theory

In contrast to the psychodynamic theory, the learning theory concentrates on how learning influences a person's behavior. This perspective emphasizes the role of experience, examining whether a person's behavior is rewarded or punished. This perspective also

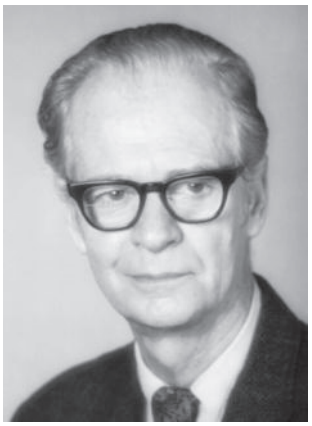
psychodynamic theories
theories proposing that development is largely determined by how well people resolve conflicts they face at different ages

psychosocial theory
Erikson's proposal that personality development is determined by the interaction of an internal maturational plan and external societal demands

epigenetic principle
in Erikson's theory, the idea that each psychosocial strength has its own period of particular importance

TABLE 1.1 Erikson's Eight Stages of Psychosocial Development

Stage	Age	Challenge
Basic trust vs. mistrust	Birth to 1 year	To develop a sense that the world is a safe, "good" place
Autonomy vs. shame and doubt	1 to 3 years	To realize that one is an independent person who can make decisions and doubt
Initiative vs. guilt	3 to 6 years	To develop the ability to try new things and to handle failure
Industry vs. inferiority	6 years to adolescence	To learn basic skills and to work with others
Identity vs. identity confusion	Adolescence	To develop a lasting, integrated sense of self
Intimacy vs. isolation	Young adulthood	To commit to another in a loving relationship
Generativity vs. stagnation	Middle adulthood	To contribute to younger people through childrearing, child care, or other productive work
Integrity vs. despair	Late life	To view one's life as satisfactory and worth living



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B. F. Skinner

emphasizes that people learn from watching others around them. Two influential theories in this perspective are behaviorism and social learning theory.

Behaviorism

B. F. Skinner (1904–1990) pioneered the study of behaviorism, in which the consequences of a behavior determine whether a behavior is repeated in the future. Skinner showed that two kinds of consequences were especially influential. *A* **reinforcement** *is a consequence that increases the future likelihood of the behavior that it follows*. Positive reinforcement consists of giving a reward such as chocolate, gold stars, or paychecks to increase the likelihood of a behavior. A father who wants to encourage his daughter to help with chores may reinforce her with praise, food treats, or money whenever she cleans her room. Negative reinforcement consists of rewarding people by taking away unpleasant things. The same father could use negative reinforcement by saying that whenever his daughter cleans her room she doesn't have to wash the dishes or fold laundry.

A **punishment** *is a consequence that decreases the future likelihood of the behavior that it follows*. Punishment suppresses a behavior either by adding something aversive or by withholding a pleasant event. Should the daughter fail to clean her room, the father may punish her by nagging (adding something aversive) or by not allowing her to watch television (withholding a pleasant event).

Social Learning Theory

Reinforcement and punishment are powerful, but people sometimes learn by simply watching those around them, which is known as **imitation or observational learning**. For example, imitation occurs when a school-age child offers to help an older adult carry groceries because she's seen her parents do the same.

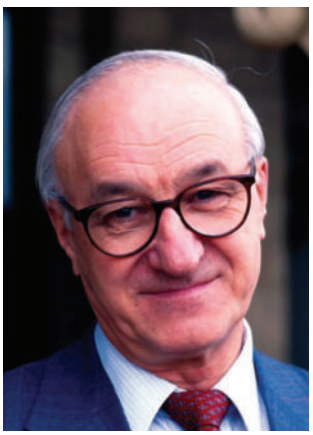
Imitation is not just mimicry. And people do not always imitate what they see around them. People are more likely to imitate someone if the target person they see is popular, smart, or talented and is rewarded rather than punished. Findings like these imply that imitation is more complex than mimicry. People look to others for information about appropriate behavior.

Albert Bandura (1925–) based his social cognitive theory on this more complex view of reward, punishment, and imitation. Bandura's theory is "cognitive" because he believes people actively try to understand what goes on in their world; the theory is "social" because, along with reinforcement and punishment, what other people do is an important source of information about the world.

Bandura also argues that experience gives people a sense of **self-efficacy**, *which refers to people's beliefs about their own abilities and talents*. Self-efficacy beliefs help determine when people will imitate others. A child who sees himself as untalented athletically, for example, will not try to imitate LeBron James dunking a basketball, even though James is obviously talented, popular, and well-rewarded. Thus, whether an individual imitates others depends on who the other person is, on whether that person's behavior is rewarded, and on the individual's beliefs about his or her own abilities.

Human Development *in Action*

If you were an elementary-school teacher, how would understanding behaviorism help you understand the behavior of the students in your class?



Linda A. Cicero/Stanford News Service

Albert Bandura

reinforcement
a consequence that increases the future likelihood of the behavior that it follows

punishment
a consequence that decreases the future likelihood of the behavior that it follows

imitation or observational learning
learning that occurs by simply watching how others behave

self-efficacy
people's beliefs about their own abilities and talents

Cognitive-Developmental Theory

Another way to approach development is to focus on thought processes and the construction of knowledge. In the cognitive-developmental theory, the key is how people think and how thinking changes over time. Three distinct approaches have developed: Piaget's theory, information-processing theory, and Vygotsky's theory.

Piaget's Theory

Jean Piaget (1896–1980), who was the most influential developmental psychologist of the 20th century, believed that throughout infancy, childhood, and adolescence youngsters want to understand the workings of both the physical and the social world.

© Bettmann/Corbis

Jean Piaget

When children try to comprehend their world, Piaget argued, they act like scientists, creating theories about the physical and social worlds. Children try to weave all they know about objects and people into complete theories, which are tested daily by experience because their theories lead them to expect certain things to happen. As with scientific theories, when a predicted event occurs, a child's belief in her theory grows stronger. When the predicted event does not occur, the child must revise her theory.

Piaget also believed children revise their theories radically at a few critical points in development. These changes are so fundamental that the revised theory is, in many respects, a new theory. Piaget claimed that these changes occur three times in development: once around 2 years of age, a second time around age 7, and a third time just before adolescence. These changes mean that children go through four distinct stages in cognitive development. Each stage represents a fundamental change in how children understand and organize their environment, and each stage is characterized by more sophisticated types of reasoning. For example, the first or sensorimotor stage begins at birth and lasts until about 2 years of age. As the name implies, sensorimotor thinking refers to an infant constructing knowledge through sensory and motor skills. This stage and the three later stages are shown in ■ Table 1.2.

Piaget's theory has had an enormous influence on how developmentalists and practitioners think about cognitive development. The theory has been applied in many ways—from the creation of discovery learning toys for children to the ways teachers plan lessons. Piaget also had his critics. In Chapter 10, we show how some have argued that cognitive development does not stop with adolescence but continues well into adulthood.

Information-Processing Theory

Information-processing theorists draw heavily on how computers work to explain thinking and how it develops through childhood and adolescence. *Just as computers consist of both hardware (e.g., disk drives, central processing unit) and software (the programs and apps they run)*, **information-processing theory** *proposes that human cognition consists of mental hardware and mental software*. Mental hardware refers to cognitive structures, including different memories where information is stored. Mental software includes organized sets of cognitive processes that enable people to complete specific tasks, such as reading a sentence, playing a video game, or hitting a baseball. For example, an information-processing psychologist would say that, for a student to do well on an exam, she must encode the information as she studies, store it in memory, and then retrieve the necessary information during the test.

information-processing theory
a theory proposing that human cognition consists of mental hardware and mental software

TABLE 1.2 Piaget's Four Stages of Cognitive Development

Stage	Age	Characteristics
Sensorimotor	Birth to 2 years	Infant's knowledge of the world is based on senses and motor skills; by the end of the period, child uses mental representation
Preoperational thought	2 to 6 years	Child learns how to use symbols such as words and numbers to represent aspects of the world but relates to the world only through his or her perspective
Concrete operational thought	7 years to early adolescence	Child understands and applies logical operations to experiences provided they are focused on the here and now
Formal operational thought	Adolescence and beyond	Adolescent or adult thinks abstractly, deals with hypothetical situations, and speculates about what may be possible

iStockphoto.com/ktaylorg

Information-processing theory helps explain how this girl learns, stores, and retrieves information so she can do well in school.

© RIA Novosti/Alamy

Lev Vygotsky

ecological theory
a theory based on the idea that human development is inseparable from the environmental contexts in which a person develops

microsystem
the people and objects in an individual's immediate environment

According to information-processing psychologists, developmental changes in thinking reflect better mental hardware and mental software in older children and adolescents than in younger children. For example, older children typically solve math word problems better than younger children because they have greater memory capacity to store the facts in the problem and because their methods for performing arithmetic operations are more efficient. And, as we show in Chapter 14, deterioration of mental hardware—along with declines in the mental software—helps explain declines in cognitive skills associated with aging.

Vygotsky's Theory

Lev Vygotsky (1896–1934) was one of the first theorists to emphasize the influence of children's sociocultural context on their thinking. Vygotsky believed that, because all societies want children to acquire essential cultural values and skills, every aspect of a child's development must be considered against this backdrop. For example, most parents in the United States want their children to succeed in school and be admitted to college because earning a degree is one of the keys to finding a good job. However, in Mali (an African country), parents want their children to learn to farm, herd animals, gather food, and hunt because these skills are key to survival in their environment. Vygotsky viewed development as an apprenticeship in which children develop as they work with skilled adults, including teachers and parents.

Ecological and Systems Perspective

Most developmentalists agree that environment is an important force in many aspects of development. However, only ecological theories have focused on the complexities of environments and their links to development. *In* **ecological theory**, *human development is inseparable from the environmental contexts in which a person develops*. The ecological approach proposes that all aspects of development are interconnected: No aspect of development can be isolated from others and understood independently. An ecological theorist would emphasize that to understand why adolescents behave as they do, we need to consider the many systems that influence them, including parents, peers, teachers, television, the neighborhood, and social policy.

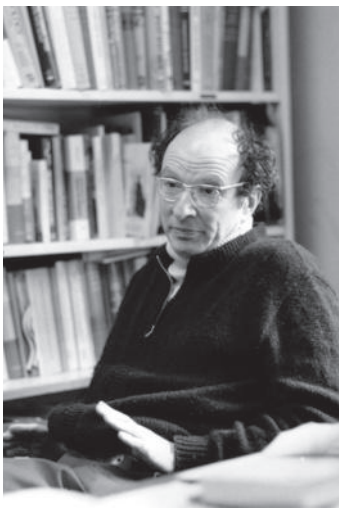
We consider two examples of the ecological and systems approach: Bronfenbrenner's theory and the competence–environmental press framework.

Bronfenbrenner's Theory

The best-known proponent of the ecological approach was Urie Bronfenbrenner (1917–2005), who proposed that the developing person is embedded in a series of complex and interactive systems (Bronfenbrenner, 1979, 1989, 1995). Bronfenbrenner divided environment into the four levels shown in ◗ Figure 1.2: the microsystem, the mesosystem, the exosystem, and the macrosystem.

At any point in life, the **microsystem** *consists of the people and objects in an individual's immediate environment*. These are the people closest to a child, such as parents, siblings, or adults and children in a day-care setting. Microsystems strongly influence development.

Microsystems themselves are connected to create the mesosystem. *The* **mesosystem** *provides connections across microsystems, because what happens in one microsystem is likely to influence others*. Perhaps you've found that if you have a stressful day at work or school, then you're often grouchy at home, which shows connections between the microsystems of home and work.



AP Images

Urie Bronfenbrenner

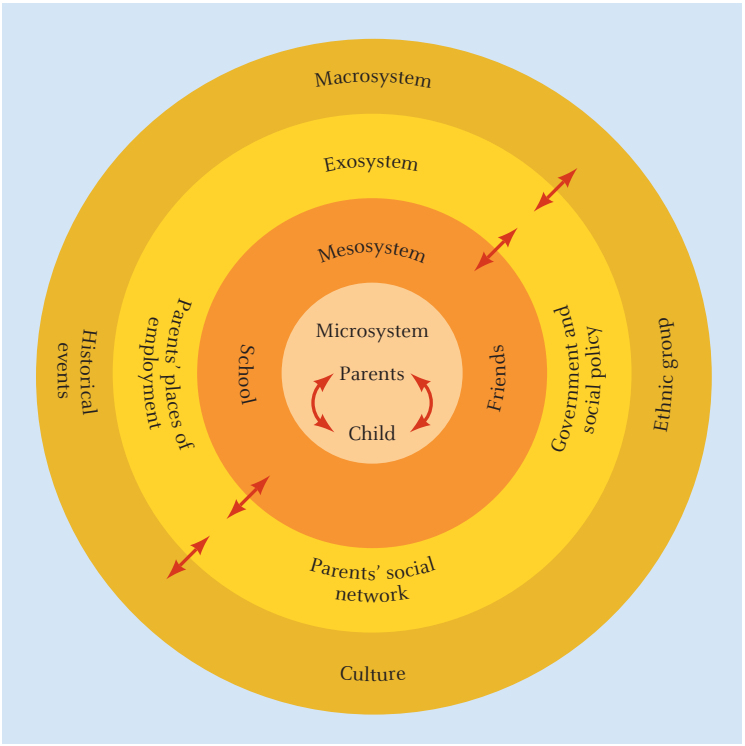


Figure 1.2

Bronfenbrenner's ecological theory emphasizing interaction across systems in which people operate.

Source: Kopp, Claire B./Krakow, Joanne B., *The Child: Development in Social Context,*1st edition, © 1982, p. 648. Adapted by permission of Pearson Education, Inc., Upper Saddle River, NJ.

The **exosystem** *refers to the social settings that a person may not experience firsthand but that still influence development*. For example, changes in government policy regarding education may mean that children living in poverty have less opportunity for enriched preschool experiences. Although the influence of the exosystem is no more than secondhand, its effects on human development can be quite strong.

The broadest environmental context is the **macrosystem**, *the cultures and subcultures in which the microsystem, mesosystem, and exosystem are embedded*. Members of these cultural groups share a common identity, a common heritage, and common values. The macrosystem evolves over time; each successive generation may develop in a unique macrosystem.

Bronfenbrenner's ecological theory emphasizes the many levels of influence on human development. People are affected directly by family members and friends and indirectly by social systems, such as neighborhoods and religious institutions—which, in turn, are affected by the beliefs and heritage of a culture.

mesosystem
provides connections across microsystems

exosystem
the social settings that a person may not experience firsthand but that still influence development

macrosystem
the cultures and subcultures in which the microsystem, mesosystem, and exosystem are embedded

competence
a person's abilities

environmental press
the demands put on an individual by the environment

Competence–Environmental Press Theory

Another view of the influence of environments on human development comes from M. Powell Lawton's (1923–2001) and Lucille Nahemow's (1933–2000) competence–environmental press theory (Lawton & Nahemow, 1973). *According to this theory, people adapt most effectively when there is a good match between their* **competence**, *or abilities, and the* **environmental press**, *or demands put on them by the environment*. As with Bronfenbrenner's theory, competence–environmental press theory emphasizes that to understand people's functioning, we must understand the systems in which they live. The competence–environmental press theory has especially influenced research and application with older adults, as we will see in more detail in Chapter 15.

Lifelong Development Perspective

Most theories of human development that we have considered so far pay little attention to adulthood. However, modern perspectives emphasize the importance of viewing human development as a lifelong process.

Life-Span Perspective and Selective Optimization with Compensation

What would it be like to try to understand your best friend without knowing anything about his or her life? We cannot understand adults' experiences without appreciating their childhood and adolescence. Placing adults' lives in this broader context is what the life-span perspective does.

According to the **life-span perspective**, *human development is multiply determined and cannot be understood within the scope of a single framework.* The basic premise is that aging is a lifelong process of growing up and growing old, beginning with conception and ending with death. No single period of a person's life (e.g., childhood, adolescence, or middle age) can be understood apart from its origins and its consequences. To understand a specific period, we must know what came before and what is likely to come afterward (Riley, 1979). In addition, how someone's life is played out is affected by social, environmental, and historical change. Thus, the experiences of one generation may not be the same as those of another.

Paul Baltes (1939–2006) and his colleagues propose four features that are central to the life-span perspective (Baltes & Smith, 2003):

- *Multidirectionality*. Development involves both growth and decline; as people grow in one area, they may decline in another and at different rates.
- *Plasticity*. Capacity is not predetermined. Many skills can be learned or improved with practice, even in late life.
- *Historical context*. People develop within a particular set of circumstances determined by the historical time in which they are born and the culture in which they grow up.
- *Multiple causation*. Development results from the biological, psychological, sociocultural, and life-cycle forces that we mentioned previously.

Courtesy of Paul Baltes/Center for Lifespan Psychology at the Max Planck Institute for Human Development

Paul Baltes

Taken together, successful adaptation to aging occurs through interaction of three processes: selection, compensation, and optimization (Baltes, 1997; Baltes, Lindenberger, & Staudinger, 2006). Selection processes choose goals, life domains, and life tasks, whereas optimization and compensation are concerned with maintaining or enhancing chosen goals. *The basic assumption of the* **selective optimization with compensation model** *is that the three processes form a system of behavioral action that generates and regulates development and aging.*

As people mature and grow old, they select from a range of possibilities or opportunities. Selection can involve continuing previous goals on a lesser scale or substituting new goals, and it may be either proactive or reactive.

Compensation occurs when people's skills have decreased so that they no longer function well in a particular domain. When they compensate, they search for an alternative way to accomplish the goal; for example, if an injury reduces a person's ability to drive, then she might compensate by taking the bus. Thus, compensation differs from selection in that the task or goal is maintained but other means are used to achieve it.

Optimization involves finding the best match possible between resources (biological, psychological, and sociocultural) and desired goals. Because people cannot achieve optimal outcomes in everything, development becomes a dynamic process of selecting the right goals and compensating when possible to help maximize the odds of achieving them.

life-span perspective
the view that human development is multiply determined and cannot be understood within the scope of a single framework

selective optimization with compensation model
the model in which three processes (selection, optimization, and compensation) form a system of behavioral action that generates and regulates development and aging

Life-Course Perspective

life-course perspective
the ways in which various generations experience the biological, psychological, and sociocultural forces of development in their respective historical contexts

The **life-course perspective** *describes the ways in which various generations experience the biological, psychological, and sociocultural forces of development in their respective historical contexts*. Specifically, it lets researchers examine the effects of historical time on how people create their lives (Dannefer & Miklowski, 2006; Hareven, 1995, 2001; Mayer, 2009). A key feature of the life-course perspective is the dynamic interplay between individual and society.

TABLE 1.3 Theoretical Perspectives on Human Development

Theory	Examples	Main Idea	Force Emphases in Biopsychosocial Framework	Positions on Developmental Issues
Psychodynamic	Psychosocial theory (Erikson)	Personality develops through sequence of stages	Psychological, sociocultural, and life cycle crucial; less emphasis on biological	Nature–nurture interaction, discontinuity, universal sequence of stages but context-specific differences in rate
Learning	Behaviorism (Skinner) Social learning theory (Bandura)	Consequences determine repetition of behaviors People learn through modeling and observing	In both theories, major emphasis on sociocultural, some on biological and psychological, little recognition of life cycle	In both theories, strongly nurture, continuity, universal principles of learning
Cognitive Developmental	Piaget's theory	Thinking develops in a sequence of stages	Main emphasis on biological and sociocultural forces, less on psychological, little on life cycle	Strongly nature, discontinuity, universal sequence of stages
	Information-processing theory	Thought develops by increases in efficiency at handling information	Emphasis on biological and psychological, less on sociocultural and life cycle	Nature–nurture interaction, continuity, context-specific differences in universal structures
	Vygotsky's theory	Development is influenced by culture	Emphasis on psychological and sociocultural forces	Nature–nurture interaction, continuity, context-specific differences
Ecological and Systems	Bronfenbrenner's theory	Developing person is embedded in a series of interacting systems	Main emphasis on sociocultural, some on psychological and life cycle, little on biological	Nature–nurture interaction, continuity, context-specific differences
	Competence–environmental press (Lawton and Mahemow)	Adaptation is optimal when ability and demands are in balance	Strong emphasis on biological, psychological, and sociocultural; moderate on life cycle	Nature–nurture interaction, continuity, context-specific differences
Life–Span and Selective Optimization with Compensation	Baltes's proposals	Development is multiply determined, goals are optimized	Strong emphasis on the interactions of all four forces; cannot consider any in isolation	Nature–nurture interaction, continuity and discontinuity, context-specific differences
Life–Course	Life-course theory	Life-course transitions are decreasingly tied to age, continuity increases over time, specific life paths across domains are interdependent	Strong emphasis on psychological, sociocultural, and life cycle; less on biological	Nature–nurture interaction, continuity and discontinuity, context-specific differences

Research from the life-course perspective has clearly shown that major life transitions, such as marriage, childbearing, starting and ending a career, and completing an education, occur at different ages across people and generations. Research has also shown that life transitions are more continuous and multidirectional than previously thought. Finally, research shows that the various domains of people's lives are highly interdependent; for example, the decision to have a child is often made in the context of where the parents are in career and education.

Overall, life-span and life-course theories have drawn attention to the role of aging in the broader context of human development, even though they have yet to reach their full explanatory potential (Mayer, 2009). These theories have played a major role in conceptualizing adulthood and have greatly influenced the research we consider in Chapters 10 through 15.

The Big Picture

As summarized in ■ Table 1.3 on page 16, each of the theories provides ways of explaining how the biological, psychological, sociocultural, and life-cycle forces create human development. Because no single theory provides a complete explanation of all aspects of development, we must rely on this biopsychosocial framework to help piece together an account based on different theories.

TEST Yourself

➤ Recall

1. _____ organize knowledge to provide testable explanations of human behaviors and the ways in which they change over time.
2. The _____ theory proposes that personality development is determined by the interaction of an internal maturational plan and external societal demands.
3. According to social learning theory, people learn from reinforcements, from punishments, and through _____.
4. Piaget's theory and Vygotsky's theory are examples of the _____ perspective.
5. According to Bronfenbrenner, development occurs in the context of the _____, mesosystem, exosystem, and macrosystem.
6. According to the _____ perspective, human development is multidirectional and plastic.

➤ Interpret

- How are the information-processing theory and Piaget's theory similar? How do they differ?
- How does a life-span perspective take a different view of human development compared to that of a theory that only focuses on childhood or adolescence?

➤ Apply

- Using three developmental theories, explain how LeBron James or Beyoncé achieved success.
- How could you use theories of human development to help you at your job?

Recall answers: (1) Theories, (2) psychosocial, (3) imitation or observational learning, (4) cognitive-developmental, (5) microsystem, (6) life-span

1.3 Doing Developmental Research

Learning Objectives

- How do scientists measure topics of interest in studying human development?
- What research designs are used to study human development?
- What ethical procedures must researchers follow?
- How do investigators communicate results from research studies?
- How does research affect public policy?

Leah and Joan are both mothers of 10-year-old boys. Their sons have many friends, but the basis for the friendships is not obvious to the mothers. Leah believes "opposites attract"—children form friendships with peers who have complementary interests and abilities. Joan doubts this; her son seems to seek out other boys who are near clones of himself in terms of interests and abilities.

Suppose Leah and Joan ask you to settle their argument. Leah believes complementary children are more often friends, whereas Joan believes similar children are more often friends. You know that research could show whose ideas are supported under which circumstances, but how? Let's see what steps a developmental researcher would take.

Measurement in Human Development Research

The first step in doing developmental research is deciding how to measure the topic or behavior of interest, choosing from among four approaches: observing systematically, using tasks to sample behavior, asking people for self-reports, and taking physiological measures.

Systematic Observation

As the name implies, **systematic observation** *involves watching people and recording what they do or say*. Two forms of systematic observation are common. *In* **naturalistic observation**, *people are observed as they behave spontaneously in a real-life situation*. **Structured observations** *differ from naturalistic observations in that the researcher creates a setting that is likely to bring out the behavior of interest*.

Structured observations are valuable in enabling researchers to observe behavior or behaviors that would otherwise be difficult to study. But researchers must be careful that their method does not make the behavior they are observing unnatural or unrealistic.

systematic observation
watching people and carefully recording what they do or say

naturalistic observation
a technique in which people are observed as they behave spontaneously in some real-life situation

structured observations
the researcher creates a setting that is likely to elicit the behavior of interest

Sampling Behavior with Tasks

When investigators can't observe a behavior directly, another popular alternative is to create tasks that are thought to sample the behavior of interest. An example is shown in ◗ Figure 1.3. To study the ability to recognize emotions, a child has been asked to look at the photographs and point to the face that looks happy. A child's answers on this sort of task are useful in determining his or her ability to recognize emotions. This approach is popular and convenient. However, there is a potential problem with it: the task may not provide a realistic sample of the behavior of interest. For example, asking children to judge emotions from photographs may not be valid, because it underestimates what they do in real life. Can you think why this might be the case? We mention several reasons on page 27 just before the chapter summary.

Figure 1.3

In this example of sampling behavior with tasks, the child is to select the face that looks happy.

Human Development *in Action*

If you were an adult protective services caseworker, what would be the relative advantages of systematic observation, sampling behavior with tasks, and self-reports?

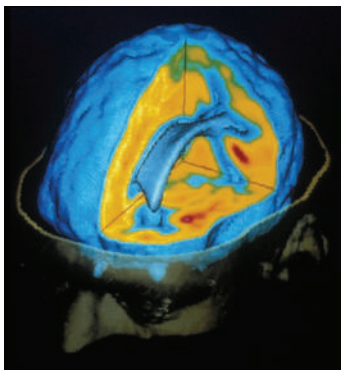


Figure 1.4

Brain imaging techniques provide a physiological measure that helps researchers understand brain–behavior relationships.

Source: © Volker Steger/Peter Arnold Images/PhotoLibrary

self-reports
people's answers to questions about the topic of interest

Self-Reports

Self-reporting represents a special case of using tasks to measure people's behavior. **Self-reports** *are people's answers to questions about the topic of interest*. When questions are posed in written form, the self-report is a questionnaire; when questions are posed orally, the self-report is an interview. Either way, questions are created that probe different aspects of the topic of interest.

Self-reports are useful because they can lead directly to information on the topic of interest. They are also convenient, particularly when they can be administered to groups of participants or online.

However, self-reports are not always a good measure of people's behavior, because people may not remember past events accurately or may be biased in their responses (because some answers are more socially acceptable than others). As long as investigators remain aware of these potential shortcomings, self-report can be a valuable tool for research in human development.

Physiological Measures

A less common but potentially powerful form of measurement is measuring people's physiological responses. Earlier, we saw that brain activity is used in neuroscience research to track certain behaviors, such as memory. Brain imaging techniques, like the one shown in ◗ Figure 1.4, are among the ways researchers accomplish this. Another measure is heart rate, which often slows down when people are paying close attention to something interesting. As another example, the hormone cortisol is often secreted in response to stress.

Physiological measures are usually specialized—they focus on a specific aspect of a person's behavior (memory, attention, and stress in the examples). What's more, they're often used with other behaviorally oriented methods. A researcher studying stress might observe several people for overt signs of stress; ask parents, partners, or friends to rate the target people's stress; and measure cortisol in the target people's saliva. If all three measures lead to the same conclusions about stress, then the researcher can be more confident about the conclusions.

The strengths and weaknesses of the four approaches to measurement are summarized in ■ Table 1.4.

TABLE 1.4 Measuring Behaviors of Interest in Human Development Research

Method	Strength	Weakness
Systematic Observation		
Naturalistic observation	Captures people's behavior in its natural setting	Difficult to use with behaviors that are rare or that typically occur in private settings
Structured observation	Can be used to study behaviors that are rare or that typically occur in private settings	May be invalid if the structured setting distorts the behavior
Sampling Behavior with Tasks	Convenient—can be used to study most behaviors	May be invalid if the task does not sample behavior as it occurs naturally
Self-Reports	Convenient—can be used to study most behaviors	May be invalid because people answer incorrectly (due to either forgetting or response bias)
Physiological Measures	Provide a more direct measure of underlying behavior	Highly specific in what is measured and thus cannot be applied broadly

Reliability and Validity

After researchers choose a method, they must show that it is both reliable and valid. *The* **reliability** *of a measure is the extent to which it provides a consistent index of a characteristic*. A measure of friendship, for example, is reliable if it consistently estimates a person's friendship network each time researchers administer it. But reliability isn't enough. A measure must also be valid to be useful in research.

The **validity** *of a measure refers to whether it really measures what researchers think it measures*. For example, a measure of friendship is valid if it actually measures friendship and not, for example, popularity. Validity is often established by showing that the measure in question is closely related to another measure that is known to be valid.

Representative Sampling

Valid measures also depend on the people who are tested. *Researchers are usually interested in broad groups of people called* **populations**. Examples of populations would be all American 7-year-olds or all African American grandparents. *Virtually all studies include only a* **sample** *of people, which is a subset of the population*. Researchers must take care that their sample represents the population of interest, because an unrepresentative sample can lead to invalid conclusions. For example, if a study of friendship in older adults tested only people who had no siblings, you would likely conclude that this sample is not representative of the population of older adults and question the validity of its results.

General Designs for Research

Having selected a way to measure the topic or behavior of interest, researchers must next embed this measure in a research design that yields useful results. Human development researchers rely on two primary designs in their work: correlational studies and experimental studies.

Correlational Studies

In a **correlational study**, *investigators look at relations between variables as they exist naturally in the world*. Imagine a researcher who wants to test the idea that smarter people have more friends. To find out, the researcher would measure two variables for each person, the number of friends that the person has and the person's intelligence, and then see whether the two variables are related.

The results of a correlational study are measured by calculating a **correlation coefficient**, *which expresses the strength and direction of a relation between two variables*. Correlations can range from −1.0 to 1.0. The correlation coefficient reflects one of three possible relationships—in our example, between intelligence and number of friends:

- People's intelligence is unrelated to the number of friends they have, reflected in a correlation of 0.
- People who are smart tend to have more friends than people who are not as smart. That is, more intelligence is associated with having more friends. In this case, the variables are positively related, so the correlation is between 0 and 1.
- People who are smart tend to have fewer friends than people who are not as smart. That is, more intelligence is associated with having fewer friends. In this case, the variables are negatively related, so the correlation is between −1 and 0.

In interpreting a correlation coefficient, the sign and the size of the correlation are both important. The sign indicates the direction of the relation between variables: a positive sign means that larger values of one variable are associated with larger values of the second variable, but a negative sign means that larger values of one variable are associated with smaller values of the second variable.

The size or strength of a relation is measured by how much the correlation differs from 0, either positively or negatively. A correlation of .9 between intelligence and number of

reliability
the extent to which a measure provides a consistent index of a characteristic

validity
extent to which a measure actually assesses what researchers think it assesses

populations
broad groups of people that are of interest to researchers

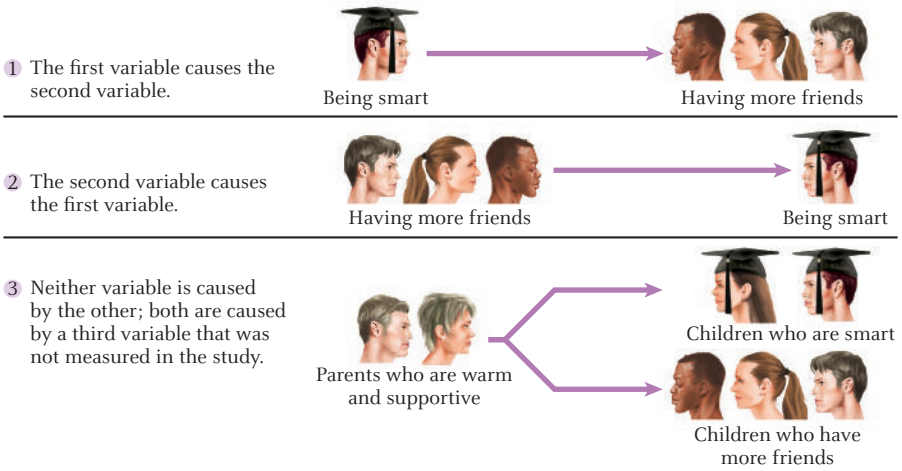
sample
a subset of the population

correlational study
an investigation that looks at relations between variables as they exist naturally in the world

correlation coefficient
an expression of the strength and direction of a relation between two variables

Figure 1.5

There are three basic interpretations of a correlation coefficient because there is no direct way to assess cause and effect.



friends would indicate a very strong relation. If instead the correlation were only .3, then the link between intelligence and number of friends would be relatively weak. Similarly, a correlation of −.9 would indicate a strong negative relation between intelligence and number of friends, whereas a correlation of −.3 would indicate a weak negative relation.

A correlational study can determine whether variables are related, but it doesn't address the question of cause and effect between the variables. For example, suppose the correlation between intelligence and number of friends is .7, which indicates that smarter people have more friends than people who are not as smart. This correlation has three possible interpretations, shown in ◗ Figure 1.5: (1) being smart causes people to have more friends; (2) having more friends causes people to be smarter; or (3) neither variable causes the other but instead both intelligence and number of friends are caused by a third variable (e.g., parents who are supportive) that was not measured in the study. Any of these interpretations could be true, and they cannot be distinguished in a correlational study. Investigators who wish to track down causes must resort to a different design, called an experimental study.

Experimental Studies

An **experiment** *is a systematic way of manipulating the key factor or factors that the investigator thinks causes a particular behavior. The factor manipulated is called the* **independent variable**; *the behavior observed is called the* **dependent variable**. In human development, an experiment requires the investigator to begin with one or more independent variables (usually different conditions, treatments, or interventions) that are thought to affect the behavior of interest. People are then assigned randomly to conditions that differ in the amount of the independent variable they are given. Finally, an appropriate measure (the dependent variable) is taken of all participants to see whether the treatment or treatments had the expected effect. Because each person has an equal chance of being assigned to each treatment condition (the definition of random assignment), differences among the conditions are attributed to the differential treatment people received in the experiment.

experiment
a systematic way of manipulating the key factor or factors that the investigator thinks causes a particular behavior

independent variable
the factor being manipulated

dependent variable
the behavior being observed

Suppose that a scientist believes that older adults' driving is more accident prone when they are talking on a mobile phone. To test this hypothesis, older adults would come to the laboratory, where they would drive a simulator. The drive is the same except that, based on random assignment, some participants talk on a mobile phone during the drive but others do not. If accidents were more common in the mobile phone condition than in the no phone condition, this would provide strong evidence that talking on a cell phone while driving causes people to drive less safely.

Paul Doyle/Alamy

An experiment uses a driving simulator to examine skills of older drivers. In this "no phone" condition, the driver is not talking on a mobile phone.

Human development researchers usually conduct experiments in laboratory-like settings, because this allows better control over the variables that may influence the outcome of the research. Thus, a shortcoming of laboratory experiments is that the behavior of interest is not studied in its natural setting. Consequently, there is always the potential problem that the results may be invalid because they are artificial—specific to the laboratory setting and not representative of the behavior in the real world.

Qualitative Studies

Suppose you live near a children's playground. Each day, you watch the children play various games with one another and on the swings and slides. Because you are interested in learning more about how children go about playing, you decide to watch more carefully. With the parents' permission, you record video of the children's play each day for several weeks. You then watch the videos and notice whether there are specific patterns that emerge.

What you have done is to conduct one type of **qualitative research**, *which involves gaining in-depth understanding of human behavior and what governs it*. Qualitative research seeks to uncover reasons underlying various aspects of behavior. Because qualitative research typically involves intensive observation of behavior over extended periods, the need is for small focused samples rather than large random samples.

Designs for Studying Development

Research in human development usually concerns differences or changes that occur over time. In these cases—in addition to deciding how to measure the behavior of interest and whether the study will be correlational or experimental—investigators must also choose one of three designs that allow them to examine development: longitudinal, cross-sectional, or sequential.

Longitudinal Studies

In a **longitudinal study**, *the same individuals are observed or tested repeatedly at different points in their lives*. Longitudinal research is the most direct way to identify change and is the only way to answer questions about the stability or instability of behavior: Will a regular exercise program begun in middle age have benefits in later life? Does people's intelligence remain the same or change across adulthood? Such questions can be explored only by testing people at one point in their development and then retesting them later.

The Spotlight on Research feature focuses on the last question about intelligence. As you read it, pay close attention to the questions and how the researchers approached them. Doing so gives you insight into the creative process of research and into the potential strengths and weaknesses of a longitudinal research study.

The longitudinal approach has disadvantages that frequently offset its strengths. One is cost: Tracking a large sample of individuals can be expensive. A related problem is the need to keep the sample together throughout the research; some may move, some die, and some stop responding. Even when the sample remains constant, taking the same test many times may make people "test wise." Because of these and other problems with the longitudinal method, human development researchers often use cross-sectional studies instead.

Cross-Sectional Studies

In a **cross-sectional study**, *developmental differences are identified by testing people of different ages*. Development is charted by noting the differences between individuals of different ages at the same point in calendar time. The cross-sectional approach avoids the

qualitative research
a method that involves gaining in-depth understanding of human behavior and what governs it

longitudinal study
a research design in which the same individuals are observed or tested repeatedly at different points in their lives

cross-sectional study
a study in which developmental differences are identified by testing people of different ages

SPOTLIGHT ON RESEARCH

The Stability of Intelligence from Age 11 to Age 90 Years

Who were the investigators, and what was the aim of the study? A long-standing issue in human development is the degree to which personal characteristics, such as intelligence, remain stable or change over one's life span. Ian Deary, Alison Pattie, and John Starr (2013) addressed this issue by examining the stability and validity of individual differences based on the same intelligence test (the Moray House Test) given to the same people at ages 11 and 90. This is one of the few studies of a personal characteristic over such a long period of time in the same people.

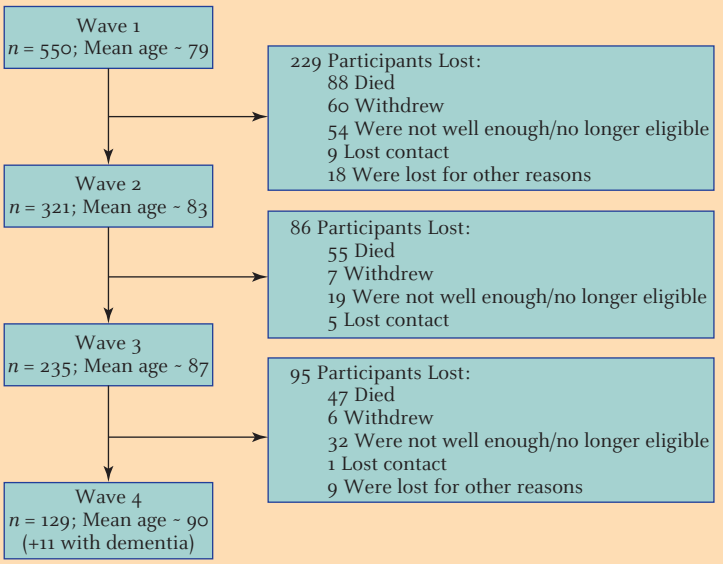
How did the investigators measure the topic of interest? The primary assessment of intelligence was the Moray House Test, which mainly tests verbal reasoning. Participants were also given the National Adult Reading Test, Mini-Mental State Examination (a screening test for dementia), Raven's Progressive Matrices (a measure of nonverbal reasoning), and the Wechsler Logical Memory Test (a test of verbal recall of stories).

Who were the participants in the study? The participants were members of the 1921 Lothian (Scotland) Birth Cohort. In 1932, at roughly age 11, almost every member of the cohort was given the Moray House Test in school. Between 1999 and 2001, 550 survivors were tested between ages 78 and 80. In 2011 and 2012, 106 survivors were tested as close to their 90th birthday as possible. Because of the long period that had elapsed since initial testing, many of the original participants were unable to be retested due to death, mental or physical incapacity, or other reasons. ◗ Figure 1.6 depicts the various reasons why participants were not retested.

What was the design of the study? The study used a longitudinal design.

Were there ethical concerns with the study? All the participants were provided information about the purpose of the study and the tests they would take. Each participant provided informed consent. Participants were screened for signs of mental impairment that may have interfered with either their ability to understand the purpose of the study and provide consent or their ability to understand and complete the tasks.

What were the results? The correlation between raw scores on the Moray House Test at age 11 and age 90 was .67. The correlation between scores at ages 79 and 90 was .73. Importantly, scores on the Moray House Test correlated with the other cognitive measures, evidence of the Moray House Test's validity. Although the sample showed evidence of several physical health problems, there was no evidence that mental ability in childhood predicts individual differences in normative cognitive aging or the likelihood of dementia.



◗ **Figure 1.6**

Number and mean age of participants and causes of attrition at each wave of testing in the Lothian Birth Cohort of 1921.

Source: Deary, I. J., Pattie, A., & Starr, J. M. (2013). The stability of intelligence from age 11 to age 90 years: The Lothian birth cohort of 1921. *Psychological Science, 24,* 2361–2368.

What did the investigators conclude? Deary, Pattie, and Starr concluded that individual differences in intelligence in middle childhood as measured by the Moray House Test showed are reasonably stable at age 90. In other words, smart 11-year-olds tend to be smart 90-year-olds and not-so-smart 11-year-olds tend to be not-so-smart 90-year-olds.

What converging evidence would strengthen these conclusions? Because the sample included only Scottish participants, it would be necessary to study people from other cultures to find out whether the results generalize across cultures. In addition, the use of only one test in the assessment of the participants at age 11 provides a narrow view of intelligence more generally.

problems of repeated testing and the costs of tracking a sample over time. But cross-sectional research has weaknesses. Because people are tested only once, we learn nothing about the continuity of development. Consequently, we cannot tell whether an aggressive 14-year-old remains aggressive at age 30 because the person would be tested either at age 14 or at age 30 but not at both.