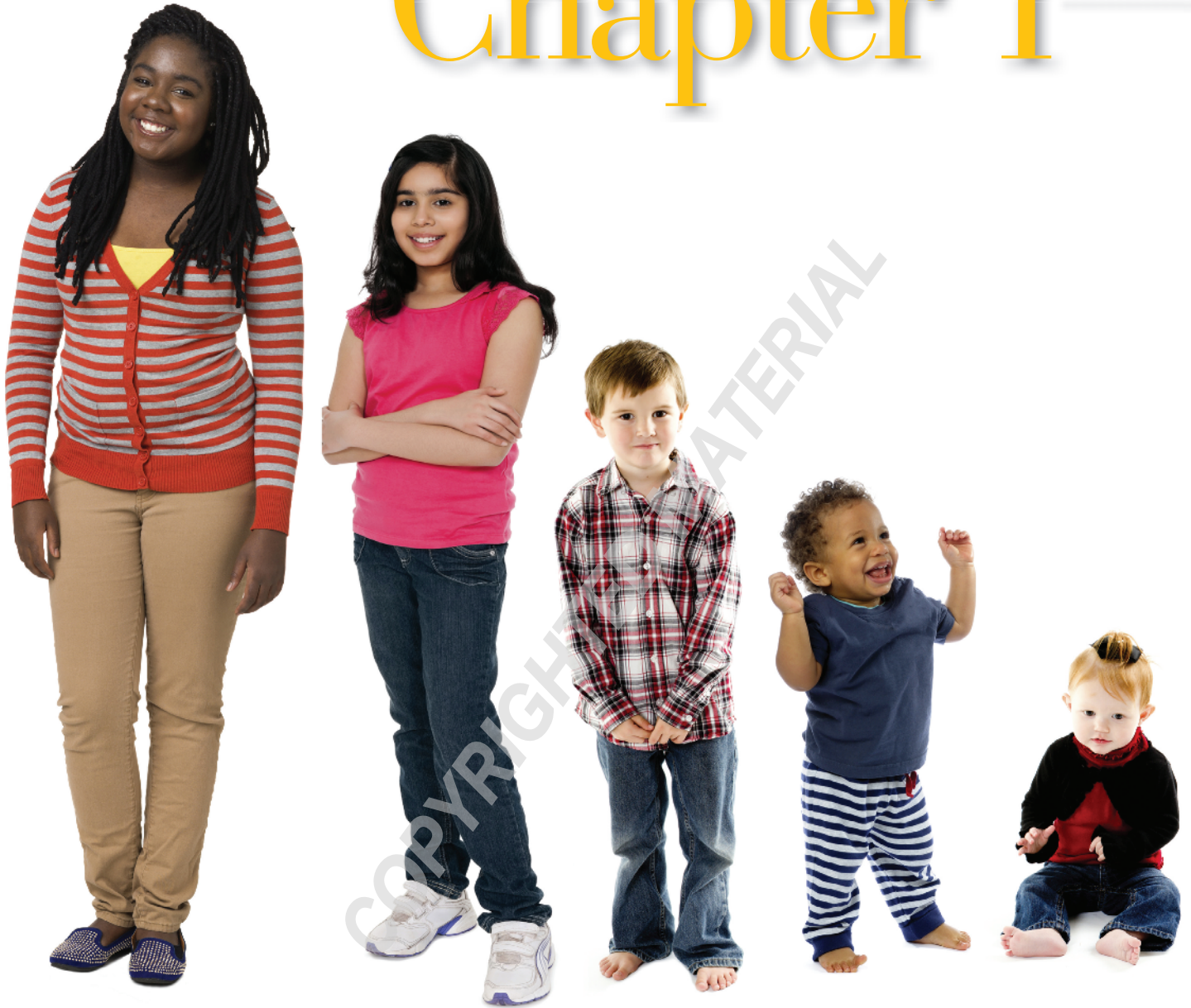


Chapter 1



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A Child's Journey

MAKING A

difference

All Children Have Birthdays

Two young sisters, Makayla and Joy, are celebrating their birthdays in grand style. The girls join their friends in getting their faces painted with fanciful designs, collecting treats from a birthday piñata, playing games for prizes, and feasting on cupcakes and candy. What's different about Makayla and Joy's birthday party is that it's taking place in a homeless shelter.

Most children look forward to celebrating their birthdays. For many children, a birthday is a time to have a party where friends and family pay lots of attention to them and give them gifts—a day to feel really special. But children living in homeless shelters, like Makayla and Joy, seldom have the chance for such an experience. Their parents or guardians generally do not have the funds for a party, and most shelters do not have a big enough budget or staff to sponsor parties for children. A birthday for these children is just another day.



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CHAPTER OUTLINE

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Chapter Summary

To three women volunteering in homeless shelters in Massachusetts, this situation looked like a problem that needed solving. In 2002, these three volunteers—Lisa Vasiloff, Karen Yahara, and Carol Zwanger—formed Birthday Wishes, Inc., to hold birthday parties for children living in shelters. Today, the organization serves more than 165 shelters and other, similar living facilities in Massachusetts, Rhode Island, and New York. (You can find out more about this organization at www.birthdaywishes.org.)

Volunteers working with Birthday Wishes plan each party based on the child's choice of a theme. They supply materials for craft projects and other activities like games and musical entertainment, along with goodie bags for all the children, a cake that fits the party theme, and a special gift. In planning, the volunteers pay attention to the family's cultural traditions concerning birthday celebrations, as described by the child's parents. Knowledge of child development also helps, because parties for 2-year-olds must be different from parties for 10-year-olds.

Sometimes all it takes is a simple observation—like the lack of birthday parties—to find an important way to make a difference for children. Throughout this book, we will be introducing different ways in which students, parents, teachers, health-care professionals, and others have made a difference in the lives of children. You may find that you, too, can make a difference.

[KEY QUESTIONS] *for* READING CHAPTER 1

1. What are some of the key issues in understanding development?
2. How has modern society affected child development and its study?
3. How would you describe the major theories of child development?
4. What specific research methods do psychologists use to learn about children's development?

IN THIS CHAPTER, you will embark on learning about an exciting field, one that is relevant to the everyday lives of most people: child development. Many of us study child development because we want to improve the lives of children, like the volunteers in our chapter-opening feature. As you will see, however, there are many different ideas about how children develop and what helps them develop optimally. We begin this chapter by examining what development is, how it differs from change, and what kinds of issues the study of development involves. Then, to introduce some significant influences on a child's life, we present a brief glimpse of a child's development at home and in the community. We also discuss the relationship between children and technology. Next, we describe the major theories currently influencing the study of children's development. From there we turn to the research methods psychologists use to study development. We conclude with a summary of guidelines for ethical practices in conducting research with children.

Children and Their Development

[KEY QUESTION] 1. What are some of the key issues in understanding development?

How thoughts about children and childhood have changed over time! More than a hundred years ago, William James, a famous American psychologist, described the newborn's world as "one great blooming, buzzing confusion" (1890, p. 488). James, in other words, felt that infants come into the world helpless and unable to make any sense at all of what is going on around them. Contrast that view with those of the noted pediatrician T. Berry Brazelton (1973), who designed a way to assess the capabilities of newborn infants (Brazelton & Nugent, 1995). According to Brazelton, the newborn—far from simply reacting to a "blooming, buzzing confusion"—behaves in a way that is complex and competent. Most psychologists today, informed by genetic research, neuroscientific evidence, and sophisticated environmental studies, agree with Brazelton.

Still, there is no doubt that the competent newborns Brazelton writes about develop rapidly into ever more competent toddlers, then children, then adolescents as they journey through childhood and into adulthood. How this occurs leads us to the definition of development that will guide our work.

What Is Development?

If we are going to consider how children develop, we need to start by defining what development is. To do that, we need to think about the relationship between development and change. Ask yourself these two questions: Does development mean change? Does change mean development? The answer to the first question is yes, and the answer to the second is no.

That said, the answers to these questions aren't as contradictory as they may first seem. In answering yes to the first question, we agree with most psychologists who study child development that development is about change (Overton, 2006). Such psychologists are concerned with changes in size, behavior, thinking, and personality during any age period. Thus, development, in a general sense, refers to change (Lerner, 2010; Rutter & Rutter, 1993).

In no way, however, does this mean that development and change are the same thing. Many changes in children have nothing to do with development. A young girl may be grumpy, complaining that her cereal is not sweet. Her father adds fruit to the cereal, and the child is now happy. The change in the child's mood has little to do with development. Clearly, development involves a very specific kind of change.

For change to be developmental, it must be *systematic*, it must be *organized*, and it must have a *successive* character (Lerner, 2002; Lerner, 2010; Overton, 2006; Rutter & Rutter, 1993; Travers & Travers, 2008). For example, most very young children walk with assistance, usually by holding the hands of a brother, sister, or parent, before they can walk on their own. By the time these children enter school just a few years later, they are not only walking but also running, hopping, and skipping with ease. Changes like this are developmental because they are *systematic*; that is, they occur in an orderly and predictable way. Walking with assistance occurs before walking independently, and walking independently occurs before skipping. Such changes are *organized* in that many systems work together in a specific way to support a child's first attempts at walking, including brain organization and muscle strength, which you will read about in Chapter 5. Finally, changes are *successive* in that those occurring at a later time have been influenced by those that occurred at an earlier time, as the ability to skip is influenced by the ability to walk and hop.

The Study of Development

Development, then, is change that is systematic, organized, and successive in character. As we discuss children's development throughout this book, we will often cite the work of developmental psychologists. **Developmental psychology** is a field concerned with describing and understanding how people grow and change systematically over their lifetimes. In studying development, psychologists focus on *what* developmental changes are, *how* they occur, *how* they are maintained, and *how* the course of development varies among individuals (Rutter & Rutter, 1993). Next, we look at a few of the basic issues that arise in the study of development.



WHEN SYSTEMS CONNECT

Developmental Domains

Developmental psychologists typically divide their analyses into three general domains: physical, cognitive, and psychosocial. The **physical domain** relates to patterns of change in children's biology and health, including sensory abilities and motor skills.



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Young infants are fascinated by patterns and movement. Psychologists today know that newborns are capable of far more than people once believed.

Development Change that is systematic, organized, and successive in character.

Developmental psychology The field of psychology concerned with describing and understanding how people grow and change over their lifetimes.

Physical domain An area of development that involves patterns of change in children's biology and health, including sensory abilities and motor skills.

Cognitive domain An area of development that involves patterns of change in children's intellectual abilities, including reasoning, learning, attention, memory, and language skills.

Psychosocial domain An area of development that involves patterns of change in children's personalities as well as their social and emotional skills, including relationships with others and the ability to regulate their own emotions.

Table 1.1 Examples of Elements of Developmental Domains

Physical	Cognitive	Psychosocial
Genetics Brain development Pregnancy and birth Physical growth Health	Language acquisition Information processing Problem solving Memory Perception	Attachment Temperament Emotions Self-regulation Relationships with peers

The **cognitive domain** involves patterns of change in children's intellectual abilities, including reasoning, learning, attention, memory, and language skills. The **psychosocial domain** relates to patterns of change in children's personalities, as well as their social and emotional skills, including relationships with others and their ability to regulate their own emotions.

Table 1.1 lists selected elements from each domain. Of course, simply listing these elements tells us little about development. We must consider how the various elements interact. For example, genetic damage (in the physical domain) may negatively affect various ways of reasoning (in the cognitive domain), and immature reasoning may lead to poor relationships with peers (in the psychosocial domain) (Chang et al., 2010; Travers & Travers, 2008). The interactions among these domains, though generally complex and multidirectional, illustrate that aspects of children's development seldom occur in isolation but instead are part of a developmental system (Lerner, Easterbrooks, & Mistry, 2013). As you will see, we pay a great deal of attention to such system connections throughout this book.

Developmental Epochs: Is Age the Answer?

We can also use a framework based on age to organize information about development. The childhood and adolescent years are typically divided into the age periods, often called epochs, listed in Table 1.2: the prenatal period, infancy and toddlerhood, early childhood, middle childhood, and adolescence. These periods make up the organizational frame of this book.

Age is useful as a general standard to assess a child's developmental status; but age by itself says little about the specific *causes* of a child's behavior (Rutter, 2006). As you continue to read this book, remember these important points:

- *Age by itself tells us about expected biological maturation*, but actual maturation varies from one individual to the next. For example, two children of the same age may differ widely in their skills.
- *Different aspects of development proceed at different rates*. For example, intellectual and physical development may follow quite divergent developmental paths, and a child may be more advanced in one area than in another.
- *Age alone reveals little about the underlying mechanisms of development*. For example, knowing a child is 9 years old and a skilled reader does not tell us how that child developed that skill.

Issues in Development

As developmental psychologists observe children's development, they speculate about the forces that produce it and conduct experiments in search of explanations. In this process, they are guided by certain questions. Two of these questions—or issues—have remained important over the history of developmental psychology:

1. What is the relationship between nature and nurture?
2. Does development proceed in a continuous or discontinuous manner?

There are good reasons why these issues have guided, puzzled, and frustrated psychologists as long as they have.

Table 1.2 Developmental Epochs

Period	Characteristics	
Prenatal	During the prenatal period—the nine months from conception until birth—the developing organism grows from a single cell to a fetus ready to be born.	 <i>Nestle/Petit Format/ Science Source</i>
Infancy and toddlerhood (0–2 years)	From birth to about 2 years is the period of most rapid growth. Remarkable physical and cognitive changes occur—for example, walking and talking—and the nature of a child's personality becomes apparent.	 <i>Hilary Helton/Photolibrary/ Getty Images</i>
Early childhood (2–6 years)	During the years from 2 to about 6, children's bodies continue to change, language develops at a staggering rate, children's thinking edges into the symbolic world, and their personalities begin to shape the nature of their developing relationships.	 <i>JGI/Jamie Grill/Blend Images/ Getty Images, Inc.</i>
Middle childhood (6–12 years)	The years from 6 to 12 comprise a period of exciting change. Children's talents in all phases of development begin to flourish. Their bodies become more coordinated, they become more involved in the symbolic world especially after they begin school, and their relationships expand briskly as their environment continues to broaden.	 <i>PhotoAlto/Sigrid Olsson/Getty Images</i>
Adolescence (12–18 or 19 years)	The years from 12 to 18 or 19 are a period of rapid growth, when children begin to leave the comfortable surroundings of childhood and prepare to enter the world of adults. Bodies change; sexual maturity beckons; and society's expectations for children mount as they prepare mentally, physically, and emotionally for adulthood.	 <i>Lisa Petkau/First Light/Getty Images, Inc.</i>

Nature The biological factors, including genes, that contribute to development.

Nurture The environmental factors and experiences that contribute to development.

Continuity The idea that development is a slow and steady process.

Discontinuity The view that development is characterized by abrupt changes in behavior; often associated with stage theories of development.

Stage theories Theories proposing that development proceeds in a discontinuous manner; each stage is qualitatively different from the ones that precede and follow it.

NATURE AND NURTURE. In learning about child development, you will see that a complex relationship exists between **nature**, which includes biological factors, such as the genes we inherit from our parents, and **nurture**, which includes environmental factors and experience. For a long time, there were arguments about whether nature or nurture is more important in children's development. We can trace the roots of the nature-nurture debate in Western philosophy and in more modern science (Dobbs, 2007; Meaney, 2010; Price, 2009; Sameroff, 2010). The prevailing view has changed from period to period. During the middle of the 20th century, for example, behaviorists strongly argued that environment is dominant. The prominent behaviorist B. F. Skinner (1953, 1983) believed that it is the *consequences of behavior* that shape learning and development. (You will read more about the behaviorists later in this chapter.)

Today, most psychologists reject any separation of nature and nurture to explain development. They prefer to focus on the interaction between these two critical forces (Diamond, 2009; Lenroot & Giedd, 2011; Lerner, 2010). Nevertheless, some psychologists still give relatively more emphasis to either nature or nurture. For example, Elizabeth Spelke (de Hevia & Spelke, 2010; Spelke, Gilmore, & McCarthy, 2011; Spelke & Kinzler, 2007) has argued that babies are born with a certain amount of innate knowledge, called *core knowledge*, a view that emphasizes the role of nature. In contrast, Betty Hart and Todd Risley (1995) believe that young children's vocabulary growth relates to the ways in which parents interact with them, a view that focuses more on the role of nurture.

what if...?



Your cousin and your uncle are watching your sister, Elena, practice playing basketball. Your uncle says, "See how great Elena's aim is? That shows she has inherited my genes for good eye-hand coordination, which will make her a successful basketball player!" Your cousin points out that Elena spends hours every weekend practicing basketball and watching others play it and that is why she is so good at it. You listen to their conversation and claim, "You're both right." What might you say to them to explain how they both could be right?

CONTINUITY AND DISCONTINUITY. The issue of continuity versus discontinuity concerns *how* developmental changes occur. **Continuity** in development means that developmental change occurs smoothly, gradually, and predictably over time. A basic question about continuity is: Are you the same person now as you were in infancy or early childhood? Those who hold that development is continuous would say that you are. Maybe you were a shy toddler and you are still shy today. In contrast, **discontinuity** means that development is marked by periods of relative quiet and periods of rapid change. The idea that development is discontinuous is often associated with **stage theories**, such as that of Piaget, which we discuss later in this chapter. Stage theories are based on the idea that development proceeds through a series of distinct stages over time, with each stage qualitatively different from the last.

CONTINUITY VERSUS DISCONTINUITY An illustration of the difference between continuity and discontinuity can be seen in Figure 1.1. An often-used example of continuous development is the growth of an evergreen tree, which offers few surprises or major transformations. It begins as a small shoot and gradually adds branches. Although it becomes taller and more branches develop, its overall configuration does not dramatically change. The mature tree very closely resembles the immature one. In contrast, consider the change in configuration that occurs when a tadpole turns into a frog. The adult frog bears little resemblance to the tadpole. The transformation from tadpole to frog is an example of discontinuous development.

Everyday stories



Continuous Development—A sapling grows bigger and adds branches.



Discontinuous Development—An adult frog seems like an entirely different animal from a tadpole.

FIGURE 1.1 An Example of Continuity and Discontinuity Continuity in development means that change occurs smoothly, gradually, and predictably over time, as when a sapling grows to a mature tree. In contrast, discontinuity means that development is marked by periods of relative quiet and periods of rapid change, as when a tadpole turns into a frog.

It is not always easy to distinguish continuity and discontinuity in children's development, however. What may appear to be discontinuous—such as an infant's apparently sudden ability to roll over—actually occurs because of a series of small gains in motor skill acquisition (Dacey, Travers, & Fiore, 2009; Lerner, 2002). Nevertheless, the theories of development that we discuss later in this chapter differ somewhat in the extent to which they focus on development as a continuous or discontinuous process.

✓ CHECK YOUR PROGRESS

1. Explain the differences between development and change.
2. Describe several reasons why knowing a child's age is not sufficient to understand that child's development.
3. What is the nature-nurture debate?
4. Explain the difference between continuity and discontinuity in development.

A Child's Journey in the 21st Century

[KEY QUESTION] 2. How has modern society affected child development and its study?

The journey that children commence in the 21st century is a complicated one. Changes in family structure, society, and technology affect development in many ways (Bass, & Warehime, 2011; Thompson, 2012; Wooldridge & Shapka, 2012). The Research Insights feature gives an example of one way children have changed over the years. At the same time, new ideas, experimental methods, and knowledge from the neurosciences have altered the way developmental psychologists study and describe development. To understand how children develop in the midst of change, we must pay particular attention to the contexts in which children live and learn. We will do so throughout this book. At this point, we look briefly at three important contexts of development in the 21st century: home, culture, and technology.

Research Insights: Are Today's Children More Imaginative?

Pretend play is important to the development of young children, because it relates to creative problem solving, divergent thinking, and emotional regulation (Berk, Mann, & Ogan, 2006; Elkind, 2007; Hoffmann & Russ, 2012; Russ,

2009). In pretend play, children develop characters and storylines. They also use one object, such as a block, to represent another, such as a truck. These tasks involve imagination because they require children to think beyond the concrete objects they are using.

Recently, two researchers compared the results of 14 studies conducted over the course of 25 years (Russ & Dillon, 2011; Miller, 2012). In each study, children ages 6 to 10 were observed for 5 minutes playing with neutral-looking puppets and several colored blocks. Because the observers had used the same method of rating children's play, the results could be compared over the years.

The researchers found that some aspects of pretend play have not changed. For example, the amount of emotion children express when playing has remained about the same. Other aspects of pretend play have changed, however. In particular, children today are more comfortable engaging in pretend play, and they show greater imagination in their make-believe scenes. For example, they are more likely to create characters who are involved in unusual activities, such as exploring the oceans, rather than more everyday activities like going to school. The authors of the study speculate that although children may have less time for pretend play today than in the past, they may have greater exposure to novelty in the games they play and the everyday challenges they face. These experiences may in turn enhance their imaginative skills.



Susanna Price/Dorian Kinderley/Getty Images

Children today are exposed to more novelty than children in the past, which may enhance their imaginative skills.

Children in the Home **P**arenting

Children benefit from close and dependable relationships that provide them with love, nurturance, and security (Collins, Maccoby Steinberg, Hetherington, & Bornstein, 2000; Grady, Karraker, & Metzger, 2012; Kovan, Chung, & Sroufe, 2009; Parade, Supple, & Helms, 2012). Complicating this simple truth is the realization that parenting is a dynamic process—a series of developmental challenges. Indeed, both parents and children develop throughout their relationship. This development is influenced by many factors: the parents' child-rearing goals and practices, the changes occurring in the child, and the social and cultural context of the times (Pluess & Belsky, 2010). Given the complexity of modern society, the possible influences on how the family develops seem almost endless.

To meet the demands of growing complexity, researchers have changed the way they analyze relationships between children and their parents, often referred to as the *under-the-roof culture*. Many studies have shifted from concentrating solely on parents or children to looking at the family as a social system (Parke & Buriel, 2006; Whiteman, McHale, & Crouter, 2011). The family system approach recognizes that there are many relationships within the family and that each relationship affects the others and is affected by all of them (Minuchin, 1988). Thus, the mother-child relationship is quite different from the father-child relationship, and both of those differ from each of the sibling relationships. Therefore, just studying, say, the mother-child relationship will not give researchers the complete picture of the family's dynamics.

Finally, today's researchers recognize that relationships among family members are *bidirectional* (for example, parent to child and child to parent), not solely *unidirectional*

Paul Simcock/Corbis



David Sacks/LifeSize/Getty Images, Inc.

Michael Hanson/Corbis



Daniel Hurst Photography/Getty Images

In today's complex society, families take many different forms.

(for example, only parent to child) (Gault–Sherman, 2012; Padilla-Walker, Carlo, Christensen, & Yorgason, 2012). Will you treat your children in the same way your parents treated you? Is there any proof that parenting styles are transmitted from one generation to another? The topic of intergenerational transmission of parenting has long fascinated developmental psychologists (Belsky, Conger, & Capaldi, 2009). Several studies have confirmed that both positive and negative parenting practices can indeed be passed from generation to generation (Beaver & Belsky, 2012; Capaldi, Pears, Patterson, & Owen, 2003; Chen & Kaplan, 2001; Conger, Neppl, Kim, & Scaramella, 2003; Neppl, Conger, Scaramella, & Ontai, 2009; Xing, Zhang, & Wang, 2011). Parents can break a cycle of negative parenting, however. For example, researchers of one study found that when low-income mothers increased their education after the birth of their first child, they showed more positive methods of responding to their child (Magnuson, Sexton, Davis–Kean, & Huston, 2009). The Parenting section in each chapter describes issues such as these involving parenting and family relationships.

The family system includes other influences as well—influences from outside the family. These include both direct influences, such as the community or neighborhood, and indirect influences, such as the policies developed by government agencies like the U.S. Department of Education. In the Policy section in each chapter, we discuss many of the policies that affect children and families.

Culture The customs, values, and traditions inherent in one's environment.

Enculturation The transmission of culture across generations.

Children and Their Cultural Communities

People and their social worlds are inseparable (Markus & Hamedani, 2007). It isn't surprising, then, that children's cultural communities are important in their development (Cohen, 2009; Cole & Packer, 2011). The importance of culture in development is not a new idea. Still, today's psychologists have awarded it a more central role than ever before in their explanations of how development occurs—as you will see later in this chapter when we discuss theories of development.

You can think of **culture** as the customs, values, and traditions inherent in a person's environment (Markus & Hamedani, 2007; Nikapota, 2002). In addition, culture includes these three characteristics (Triandis, 2007):

1. Culture emerges from adaptive interactions between humans and their environments.
2. Culture consists of shared elements such as language, time, and place.
3. Culture is transmitted across time periods and generations, a process known as **enculturation**.

STARTING SCHOOL IN DIFFERENT CULTURES Consider how culture influences the rituals developed for the beginning of the school year in elementary schools. In some Asian countries, parents go to school with their child on the first day and stay in the building so that a photograph can be taken of all the parents, children, and teachers together. In many Eastern European countries, children bring flowers to the teacher on the first day of school, and the youngest and oldest child together lead the other children into the building, with the parents watching and cheering. Both of these rituals contrast with those in the United States, which show wide individual variation. Some parents take their child to the classroom and meet the teacher. Other parents simply accompany their child to a bus stop.

Everyday stories

Families transmit culture across generations and time.

Educator and researcher Barbara Rogoff (2003; Rogoff, Correa-Chavez, & Silva, 2011) has noted that human learning and development are cultural processes. A great deal of research has supported this view. For example, children from different cultural communities interpret physical punishment differently. Rogoff (2003) explains that many North American adolescents associate firm parental control with rejection and hostility, whereas Korean adolescents have been found to interpret strictness as a sign of parental warmth and concern. In other words, the children's perception of their parents' behavior



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Matt Henry/Gambr



REUTERS/CARLOS BARRIA/LANDOV

On the first day of school, varying rituals are carried out in different countries.

makes a difference in how the children react to it, and often that perception varies by cultural group. Parents in different cultures also hold distinct views about children's development, as we discuss in *Culture and Parents' Views on Children's Disabilities*.

Researchers have also found differences in what young people from different cultures focus on—for example, in photographs. In a study investigating cultural differences between Chinese and American students, the students were shown photos of objects on a complex background—a tiger in a jungle, for example. The American students focused more on the objects, while the Chinese students turned their attention to the background (Chua, Boland, & Nisbett, 2005; Norenzayan, Choi, & Peng, 2007). Studies such as these appear throughout this text to illustrate the powerful impact of culture on development and to demonstrate that we cannot assume that all children think, feel, see, and perceive the behavior of others in the same way, even when they are placed in what appear to be identical situations (Nisbett, 2007).

Children in a Technological World

Many children today are developing in a world that provides technological tools at their fingertips: television, computers, cell phones, video games, electronic tablets, and so forth. Indeed, a recent analysis of media use by 8- to 18-year-olds in the United States says that on average they spend more than 7½ hours a day, 7 days a week, involved with various forms of media (Rideout, Foehr, & Roberts, 2010). Members of

Culture and Parents' Views on Children's Disabilities

Children with disabilities are born in all cultures. But families look at these disabilities differently depending on their cultural perspectives (Hauser-Cram, Cannarella, Tillinger, & Woodman, 2013). Researchers who study parenting across cultures stress the importance of parents' *ethnotheories*, their culturally shared belief systems about children's development and parents' roles (Harkness & Super, 2005; Harkness et al., 2011). In the United States, many parents take a scientific approach. They discuss a child's disability in terms of its biological causes, such as genes, physical trauma at birth, or early exposure to toxins like cigarette smoke or lead paint.

Even in the United States, though, subcultural groups may not share the dominant view. In one U.S. study, researchers asked mothers with a Mexican or Puerto Rican background about their children with a disability (Skinner, Bailey, Correa, & Rodriguez, 1999). Many of the mothers viewed the child as a gift from God. They believed they had received this gift because they were worthy of such parenting or because they would benefit from its challenges.

A different view is evident in a narrative about Lia, a child whose parents lived in the United States but were part of the Hmong culture from Cambodia (Fadiman, 1997). Lia had a seizure disorder that resulted in many developmental problems. Members



Manny Crisostomo/Sacramento Bee/MCT via Getty Images

Foua Yang, Lia Lee's mother, holds a photo of Lia, who had a seizure disorder. The Hmong culture, to which the family belonged, believed that the seizures might enable Lia to see into the spiritual world.

of her cultural group, however, viewed her seizure disorder as "an illness of some distinction" (Fadiman, p. 21) because they considered that the seizures might allow her to see into the spiritual world.

Variations such as these can affect how parents of children with disabilities seek treatment and support from their communities. We might expect, for example, that parents who take a scientific view would more likely seek medical intervention than parents who view the disability as a gift from God or as a window into the spiritual world.

this age group spend more time involved with media than in any other activity except (maybe) sleeping.

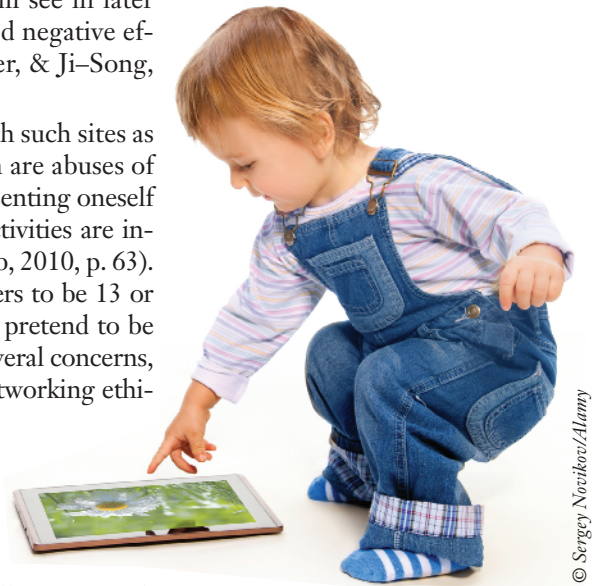
The Expanding Media World

The introduction of each new medium has been accompanied by concerns about its appropriateness (Paik, 2001). Nevertheless, technological improvements have made the expanding media world almost irresistible to children. Let's look at a few examples.

- *Television and children.* Today's young people watch television about 4½ hours per day, which includes time spent watching TV content on other platforms, such as laptops, smart phones, and tablets (Rideout et al., 2010). Researchers have found that television viewing begins before the age of 3 and peaks at about the age of 12. At the same time, interest changes from cartoon and educational programs such as *Sesame Street* to shows of greater complexity and violence (Comstock & Scharrer, 2006). Later chapters in this text discuss many effects of children's television and video viewing, both negative and positive.

- *Cell phones and children.* An image of an older child or teen typically includes a cell phone. Thirty-one percent of 8- to 10-year-olds, 69% of 11- to 14-year-olds, and 85% of 15- to 18-year-olds have their own phones and use them for talking, texting, listening to music, playing games, watching videos, and accessing other sites on the Internet (Rideout et al., 2010).
- *Video games and children.* There has been a steady increase in video gaming over the past few years, mainly because such games can now be played on a variety of platforms (Rideout et al., 2010). On a typical day, 8- to 18-year-olds spend more than an hour playing video games. Violence in video games, along with violence on television and in films, has come in for a great deal of criticism, as you will see in later chapters. This criticism stems from the fact that studies have identified negative effects of exposure to media violence (Brocato, Gentile, Laczniak, Maier, & Ji-Song, 2010; Gentile, Mathieson, & Crick, 2011).
- *Social networking and children.* Internet-based social networking through such sites as Facebook and Twitter is a well-known phenomenon. Also well known are abuses of these sites. “Using anonymity to avoid face-to-face contact, misrepresenting oneself on a social network, and even participating in libelous or fraudulent activities are increasingly common practices of teens in social network situations” (Lamb, 2010, p. 63). And the problem isn’t limited to teens. Although some sites require users to be 13 or older, they have no practical way to verify ages, and many young users pretend to be older when signing up. Young people’s use of social networking raises several concerns, including the important issue of teaching young people to use social networking ethically. Later chapters address this issue in more detail.

This brief overview of the technological world of children sheds light on some of the environmental complexity in which they develop. Children’s use of technology has many implications. It has expanded ways in which children can access and learn information, but it also presents challenges to the development of their decision-making skills. As noted, you’ll read more in the chapters to come about the issues we have raised here. There, we will consider them within the context of specific age groups.



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Children—even toddlers—find the expanding media world almost irresistible.

what if...?



A friend of yours has been encouraging you to give your 3-year-old daughter a smartphone. Your reaction is a stunned “Are you out of your mind?” look. But wait: Is the suggestion as absurd as it seems? You may have read an article in a respected newspaper (Swidey, 2010) that presented logical reasons for being so generous with a 3-year-old. The size of the phone is ideal for small hands, and the colorful icons immediately attract their attention. Toddlers touch all the buttons, run their hands over the screen, and promptly become fascinated. Companies have discovered this new market and have rushed to provide applications for toddlers and preschoolers, arguing that smartphones are good for children’s development because they can provide “anywhere, anytime learning.” Will you be tempted to buy your 3-year-old a smartphone? In future chapters you will read how 3-year-olds think and learn about the world, after which you might reconsider this question and see if you have the same response.

Video Games and Learning **P**ractice

Can children learn from playing video games? Although many researchers have studied violent video games and their effects on children’s aggression (Anderson et al., 2010), fewer have focused on the potential learning that can result from playing certain types of video games. One group of researchers, though, wondered whether children could improve their spatial skills by playing certain video games. Spatial skills involve imagining how a two- or three-dimensional object or array of objects would appear if rotated. You use spatial skills, for example, in completing a jigsaw puzzle, in order to imagine how a piece would look if it were rotated to be placed in a specific location. Such skills are related to the ability to solve some mathematical problems (Ganley & Vasilyeva, 2011).

Some researchers (De Lisi & Wolford, 2002) studied third-grade students as they played a video game that involved mental rotation of pieces on the screen. The students showed improvement in their mental rotation skills on other tasks after playing the game for approximately a half hour each day for 11 days. It appears, then, that playing certain types of video games can enhance the skills children use in solving problems in math. Other researchers have considered other aspects of video games, such as requiring children to use different strategies to solve a problem, that make them useful learning tools (Boyan & Sherry, 2011). Such research suggests that although many video games are violent and offer little value to teach children, it is possible to design video games that result in productive learning.

 CHECK YOUR PROGRESS

1. Explain why asking only a mother or a father to report on the way a family operates would provide incomplete information.
 2. Give an example of a bidirectional relationship between a parent and a child.
 3. Discuss the meaning of *enculturation* as a guide to understanding children's development.
-

Explaining Development: The Theories

[**KEY QUESTION**] **3.** How would you describe the major theories of child development?

Developmental psychologists are scientists. As such, they have formed theories of development—frameworks for understanding observations and making predictions. Why are such theories valuable? Theories are important because they help guide us in investigating and understanding how children develop. Theories also help us to structure educational and psychosocial interventions to support children's learning and development. Kurt Lewin, a well-known psychologist of the 1930s and 1940s, claimed that there is nothing as practical as a good theory, and many psychologists today continue to agree with that claim.

In this section, we briefly discuss the major features of several important developmental theories, as summarized in Table 1.3. In later chapters, we analyze them further and apply them to various developmental issues. Some of the traditional theories we discuss are criticized today as being too *unidimensional* to explain the complexity of development; that is, they focus on only one aspect of development. For example, Freud spent his lifetime delving into the secrets of personality development, while Piaget focused exclusively on cognitive development. Nevertheless, each theory has valuable insights to offer.

Psychoanalytically Based Theories

Both Sigmund Freud and Erik Erikson proposed stage theories of development that focused on personality formation. In each stage, children face conflicts that they must resolve to move on successfully to the next stage. In terms of the issues we discussed earlier, recall that stage theories like Freud's and Erikson's consider development discontinuous. Each stage marks a qualitative change from the one before. Psychoanalytic theories consider both nature and nurture to be important, as children have natural innate impulses that need to be controlled or directed through the nurture of parenting.

Sigmund Freud and Psychoanalytic Theory

Sigmund Freud (1856–1939) is the father of **psychoanalytic theory**, which attributes personality development largely to unconscious sources in the human mind. Freud, a

Psychoanalytic theory Freud's view of personality development, which attributes it largely to unconscious sources in the human mind. Psychoanalytic theory includes the idea that children pass through five stages of psychosexual development that affect their adult personalities.

Table 1.3 Major Theories of Child Development

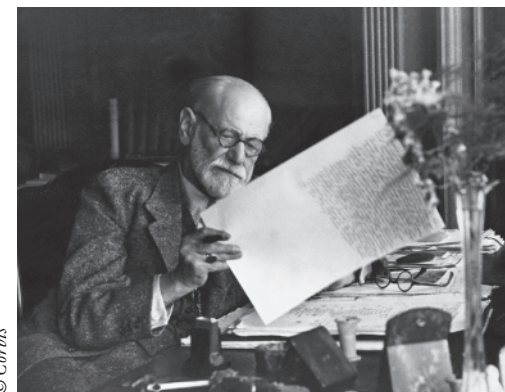
Theory: Major Theorists	Characteristics	Is Development Driven by Nature or Nurture?	Is Development Continuous or Discontinuous?
Psychoanalytically based theories: Freud, Erikson	Focus on personality formation; children must resolve conflicts to progress through stages	Both nature (innate impulses) and nurture (early experiences with caregiver)	Both Freud and Erikson propose a stage theory: discontinuous
Cognitive theories: Constructivist: Piaget, Vygotsky Information Processing: Siegler	Focus on the way children think	Both nature (innate desire to learn) and nurture (stimulating environment)	Piaget's stage theory: discontinuous Vygotsky's sociocultural theory: elements of both Information processing: continuous
Learning theories: Pavlov, Watson, Skinner, Bandura	Focus on how experiences affect learning and behavior	Nurture drives development	Continuous
Ethological theories: Lorenz, Bowlby	Focus on biology and the role of early experiences during specific periods	Both nature (biology) and nurture (early experiences) important but emphasis on early experiences	Elements of both: critical periods suggest discontinuous aspects of development
System theories: Bronfenbrenner, Gottlieb, Lerner, Sameroff	Focus on how interacting environmental and biological systems shape development	Both nature (biology) and nurture (multiple contexts) and their interaction	Continuous but may incorporate discontinuous elements

physician who spent most of his life in Vienna, based his theories on observations of patients he saw in his practice—upper-class members of Viennese society. His ideas were particularly influential in the early 20th century. Although Freud's ideas no longer dominate psychology, his insistence on the decisive role of children's early years, and especially their early relationships, has remained a potent and controversial concept (Cairns & Cairns, 2006).

PERSONALITY STRUCTURE. Freud (1940) viewed personality as composed of three parts: the *id*, the *ego*, and the *superego*, which appear at different stages of a child's development. The *id*, which is present at birth, contains all of our basic instincts, such as the need for food, drink, and sex. It seeks simply to secure pleasure, and so it often clashes with society's rules, thus leading to conflict. As this occurs, the *ego*, which begins to develop early in childhood, attempts to reconcile the *id*'s drives with society's expectations. The *ego* is the key element in our personality—the (usually) rational part that does all the planning and keeps in touch with reality. Freud believed that the stronger the *ego* becomes, the more realistic, and usually the more successful, a person is likely to be (Lerner, 2002). The *superego*, the moral component of personality, is the arbiter of right and wrong—our conscience. The desires of the *id* and the demands of the *superego* are in constant conflict, with the *ego* struggling mightily to enact compromises between these two powerful forces. Because these forces are in such a dynamic struggle, this theory is often referred to as *psychodynamic*.

STAGES OF DEVELOPMENT. For Freud, personality development meant moving through five psychosexual stages. Each stage is distinct from the others and has a major function, which is based on a pleasure center. This pleasure center must be stimulated appropriately (not too much, not too little). If it is not, the person becomes fixated (remains at that stage) and is unable to move successfully to the next stage (Kahn, 2002). Freud's stages are summarized in Table 1.4.

Freud's work, as important as it was, has been criticized on many grounds. Freud was a physician who based his ideas on his work with patients in his medical practice. Therefore, his ideas may not apply to people in general. Perhaps more importantly, his



Sigmund Freud's psychoanalytic theory attributes personality development largely to unconscious sources. Freud was particularly interested in the early years of children, especially their early relationships.

Table 1.4 Freud's Psychosexual Stages

Stage	Approximate Age	Description
Oral	Birth–1½ years	The mouth is the main source of pleasure.
Anal	1½–3 years	The anus is the pleasure center, and toilet training is the major task.
Phallic	3–5 years	The genitals are the main source of pleasure.
Latency	5–12 years	Repression of sexual desire occurs. Such desires are considered to be “latent” during this stage.
Genital	12-plus years	This is the time of a reawakening of sexual desires. It should lead to sexual maturity.

ideas are difficult, if not impossible, to test. As you will see, whether a theory can be tested is an important consideration among psychologists today.

Erikson's Psychosocial Theory of Development

Erik Erikson (1902–1994), although his theoretical orientation was strongly psychoanalytic, became critical of Freud's emphasis on psychosexual stages. He became a leading proponent of a **psychosocial theory** of development, which focuses on the effects of social interactions. He believed that children interact with an ever-widening circle of individuals, beginning with their mothers and ending with all of humanity (Erikson, 1950). Erikson is well-known for his focus on the development of the ego, in particular. According to Erikson, individuals pass through eight stages of development, as listed in Table 1.5. In each stage, they experience a “crisis” in their emotional equilibrium. In Erikson's work, the term *crisis* refers to a challenge that pushes for resolution. The resolution occurs through processes provided by the family and culture in which a child lives. Although resolutions do not always occur, they are necessary to the continuing psychosocial strength of the developing ego.

Psychosocial theory Erikson's explanation of development, which focuses on the effects of social influences. Erikson believed that individuals pass through eight stages of development. In each stage, they must resolve a crisis that determines their continuing healthy psychological development.

TWO PSYCHOANALYTIC VIEWS Suppose two psychologists are observing 3-month-old Ari, who is in the arms of his mother. As Ari starts to fuss, his mother smiles at him warmly and gives him a pacifier to suck on. Ari settles down. Both psychologists witness the same behavior, but each interprets it differently. The first psychologist discusses how much Ari enjoys sucking on objects, and attributes it to his innate need for oral pleasure. The second comments on the way Ari's mother responds warmly and positively to her son, which will serve to address his need to establish trust during this life stage.

Although both psychologists follow the psychoanalytic tradition, the first adheres more closely to Freud's interpretations, whereas the second is more closely aligned with Erikson's view. You can see how two professionals observing the same behavior might interpret it differently based on the theoretical perspective each has taken.

Everyday stories

Like Freud's five-stage theory, Erikson's eight stages of psychosocial development are difficult to test scientifically. Nevertheless, Erikson's views remain popular, and most psychologists agree that his ideas capture many of the important challenges for each life phase. You will read more about Erikson's stages in several later chapters.

Cognitive Theories

Moving from the world of personality development to that of cognitive development requires us to consider how children know and learn. In this section, we discuss two distinct types of theories. The first, termed *constructivism*, takes us first to the ideas of



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Erik Erikson's psychosocial theory focuses on how children's success with the fundamental tasks or “crises” related to each life stage affect their development.

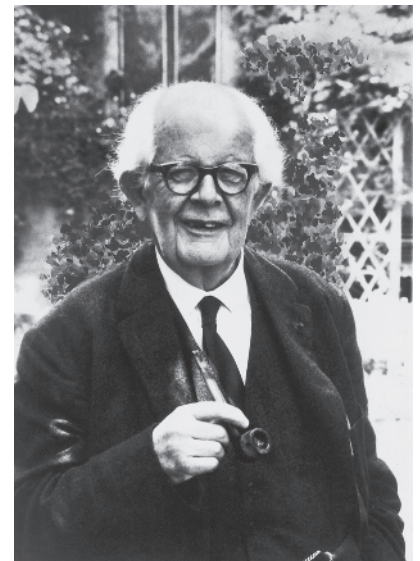
Table 1.5 Erikson's Psychosocial Stages of Development

Stage	Approximate Age (years)	Psychosocial Stage	Description
Infancy	Birth–age 1	Trust vs. mistrust	Infants develop a basic trust in others. If their needs are not met by their caregivers, mistrust develops.
Toddler	2–3	Autonomy vs. shame, doubt	Children exercise their new motor and mental skills. If caregivers are encouraging, children develop a sense of autonomy, versus shame and doubt.
Early childhood	4–5	Initiative vs. guilt	Children enjoy initiating activities and mastering new tasks. Supportive caregivers promote feelings of power and self-confidence, versus guilt.
Middle childhood	6–11	Industry vs. inferiority	Children learn productive skills and develop the capacity to work with others; if not, they feel inferior.
Adolescence	12–18	Identity vs. identity confusion	Adolescents seek to develop a satisfying identity and a sense of their role in society. Failure may lead to a lack of stable identity and confusion about their adult roles.
Young adulthood	19–35	Intimacy vs. isolation	Young adults work to establish intimate relationships with others; if they cannot, they face isolation.
Middle age	36–65	Generativity vs. stagnation	Middle-aged adults seek ways to influence the welfare of the next generation. If they fail, they may become self-absorbed.
Old age	Over 65	Integrity vs. despair	Older people reflect on the lives they have lived. If they do not feel a sense of accomplishment and satisfaction, they live in fear of death.

Jean Piaget and then to the views of Lev Vygotsky. Both theorists are considered constructivists because they focused on the ways in which children construct knowledge. The second approach, *information processing theory*, focuses on how children pay attention to, remember, and develop strategies about information. Both types of theories share the view that nature and nurture interact in shaping development. They are also similar in assigning children active roles in their own development. Where they differ is in their orientation toward the continuity-versus-discontinuity issue. Piaget's stage theory proposes discontinuous development, while information processing theory assumes continuous development; Vygotsky's theory has elements of both.

Piaget's Theory of Cognitive Development

Jean Piaget (1896–1980) was a biologist who became fascinated with studying how children think and how their thinking changes (Gruber & Vonèche, 1977). Why do infants who drop a toy from their high chair seem to lose interest in it immediately? Why do young children think there is more milk in a tall, thin container than in a short, wide one? Searching for insights into such behaviors led Piaget (1952, 1965, 1969, 1973) to devise a theory of cognitive development that has strongly influenced our appreciation of the growth of children's thinking.



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Jean Piaget's influential stage theory of cognitive development is based on the idea that children construct knowledge, rather than having it "poured" into them.

Jean Piaget's theory is based on **constructivism**, the view that children *construct* knowledge, rather than having it “poured” into them. This theory emphasizes the importance of children's active engagement with objects and events. According to Piaget, in infancy, children begin to develop *schemas*, or schemes—mental structures that represent things they have experienced. For example, a 2-month-old might have a scheme to represent grasping an object. Once a mental structure is formed (for example, grasping an object), it is linked to others (such as bringing an object to the mouth), a process Piaget called *organization*.

Schemas change over time through *adaptation*, which in turn consists of assimilation and accommodation. When children *assimilate* something, they fit it into a mental structure they have already formed. You can see an example of assimilation and accommodation in Figure 1.2. Imagine a 2-year-old boy who sees a cow for the first time. If he is familiar with dogs, he may say “doggie” when he sees the cow. The child is adapting the new object, the cow, into his current scheme for dogs. Eventually, though, the child will learn that cows differ from dogs (they moo instead of bark, their ears and tail have different shapes, and so on). Thus, the structure will have to be changed, a process called *accommodation*. Children (and adults) continually search for *equilibrium* as they try to discover the balance between assimilation and accommodation.

Organization and adaptation are inseparable; they are two complementary processes of a single mechanism. Through these processes, children pass through four stages of cognitive development, which are described in Table 1.6. All children pass through the same stages, in the same order. Each stage involves thought processes that are qualitatively different from those of the previous stage. Piaget also maintained that children do not regress in their stage development. Once they have achieved a new



a. Assimilation

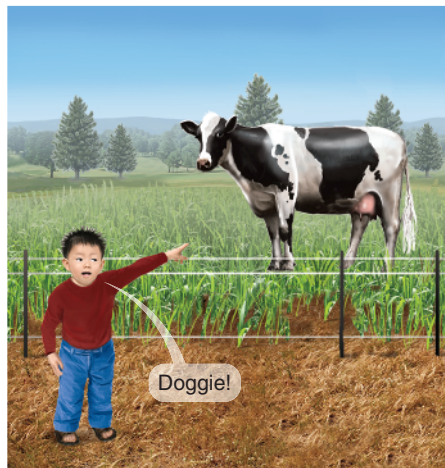


FIGURE 1.2 A Simple Example of Assimilation and Accommodation

A toddler who is familiar with dogs but not with cows may refer to a cow as a dog in an attempt to assimilate new information into a mental structure he has already formed. When he learns that cows are different from dogs, he will form a new structure to accommodate this new understanding.



b. Accommodation

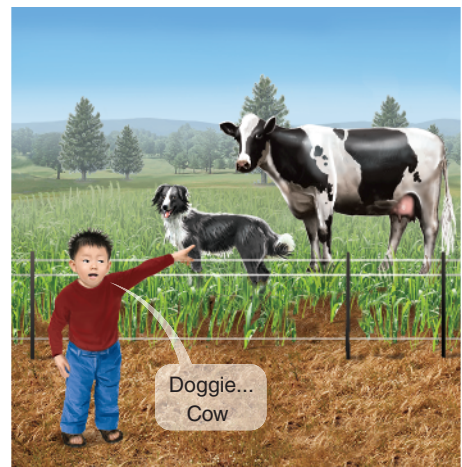


Table 1.6 Piaget's Stages of Cognitive Development

Stage	Approximate Age	Features
Sensorimotor	Birth–2 years	Infants understand the world through actions.
Preoperational	2–7 years	Preschoolers begin to use representations, including words and pictures, rather than actions to understand the world.
Concrete operational	7–11 years	Children develop the ability to reason about concrete objects.
Formal operational	11-plus years	Adolescents begin to use abstract thinking and reasoning with more complex symbols.

stage of thinking, they may stay at that stage or move on to the next one, but they will not move backward. As you look at Table 1.6, keep in mind that the ages are approximate.

Piaget has been very influential in the study of child development, especially in regard to his attention on how children's thinking differs from that of adults. Nevertheless, he has come in for criticism. Some believe that change takes place more gradually than Piaget's stage theory implies—in other words, that development is more continuous than discontinuous (Courage & Howe, 2002). Others offer evidence that Piaget underestimated the abilities of young children (Baillargeon, 2004; McCarty & Keen, 2005; Moore & Meltzoff, 2004). Still others point out that he based his conclusions on observation of a very limited sample made up largely of his own three children. Thus, he failed to take possible social and cultural differences into account (Case & Okamoto, 1996).

Vygotsky's Theory of Cognitive Development

Whereas Piaget focused on processes occurring within the developing child, the Russian psychologist Lev Vygotsky (1896–1934) turned his attention to social and cultural processes. Like Piaget, Vygotsky believed that children construct knowledge, but unlike Piaget, he emphasized *co-constructivism*. That is, Vygotsky (1962, 1978) claimed that children construct knowledge with the assistance of others, especially with the assistance of skilled adults and more knowledgeable peers. These people interact with the children in a way that emphasizes the things that their culture values. For this reason, Vygotsky's theory is often referred to as **sociocultural theory**. The social emphasis of Vygotsky's view highlights the cultural context in which children are developing.

Vygotsky was familiar with the writings of Piaget. Like Piaget, he believed that children are active in their construction of knowledge. Whereas Piaget focused on how an individual child reasons, however, Vygotsky emphasized that a child advances in concept formation primarily through interactions with others. He believed that children learn first at the social level through such interactions and then gradually internalize that learning. Because of the social importance of language, Vygotsky focused on how children develop language and how language skills promote children's dialogues with others. Through such interaction, Vygotsky maintained, children advance their cognitive development.

From his studies of development, Vygotsky introduced the notion of the *zone of proximal development (ZPD)*. He defined the ZPD as the distance between a person's actual developmental level, as determined by independent problem solving, and the higher level of development that could be achieved under the guidance of an adult or a more capable peer (see Figure 1.3). Psychologists and educators have used the zone of proximal development as a basis for the concept of *scaffolding*. Scaffolding offers support to children as they attempt to learn—an example of a practical application of the zone of proximal development.

Sociocultural theory Vygotsky's theory that children's cognitive growth depends on their interactions with adults and more knowledgeable peers, which in turn are based on broad cultural values.



Michael Cole, University of California, San Diego

Lev Vygotsky believed that children construct knowledge with the assistance of skilled adults and more knowledgeable peers.

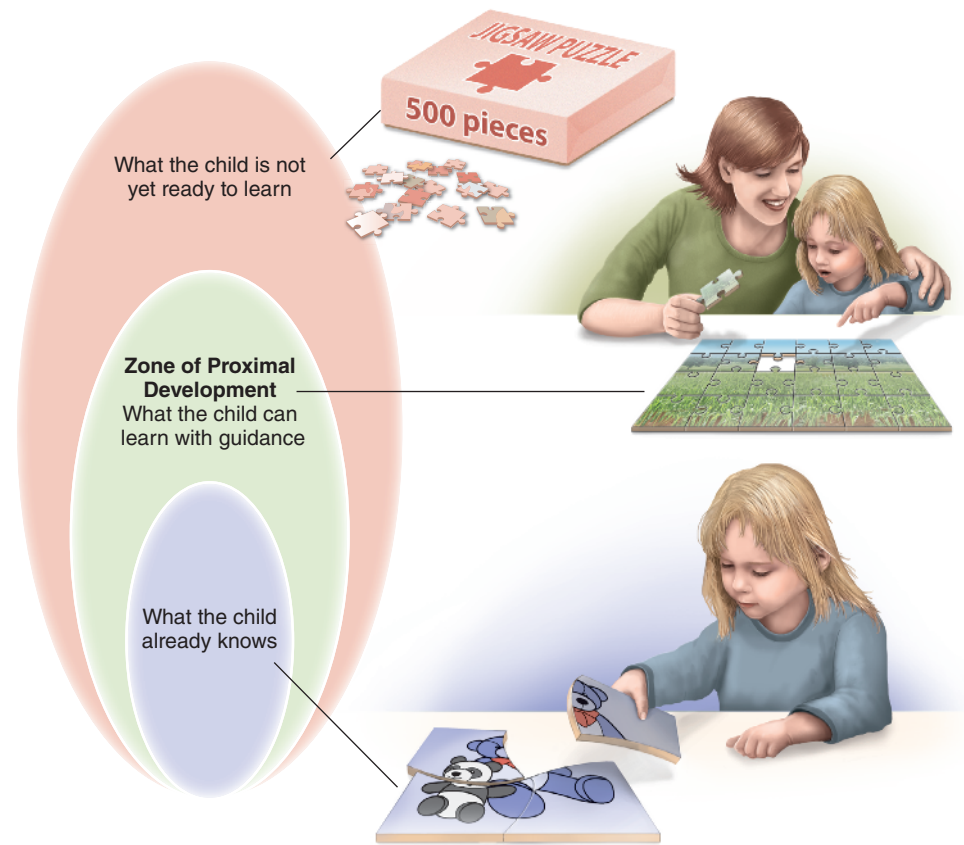


FIGURE 1.3 The Zone of Proximal Development Vygotsky introduced the notion of the zone of proximal development, which he defined as the distance between a person's actual developmental level, as determined by independent problem solving, and the higher level that the person can achieve under the guidance of an adult or a more capable peer.

what if...?



Suppose your 7-year-old cousin is trying to figure out how to complete a 100-piece jigsaw puzzle for the first time. She dumps the pieces out of the box but then cannot figure out what to do next. Eventually, she selects one piece, looks at it, and then selects another to see if it fits with the first one. When it doesn't, she puts it back in the pile of pieces. She is quickly getting frustrated and asks for your help. What would you do to scaffold her actions as she works on the puzzle?

Developmental psychologists have generally embraced Vygotsky's theory. It provides a broad view of development by considering the importance of the social and cultural context. It is also appealing because of its emphasis on the role of instruction in the learning process. It is a broad theory, however, and so is somewhat vague about how children actually develop. Despite the importance attributed to instruction from teachers and more skilled peers, for example, the nature of how instruction actually advances children's development has not been fully described (Eun, Knotek, & Heining-Boynton, 2008).

Information Processing Theory

The information processing perspective is often said to have taken its inspiration from the way computers work. Like computers, our brains receive input, process it, store it, and produce output (see Figure 1.4). Probably the most productive way of

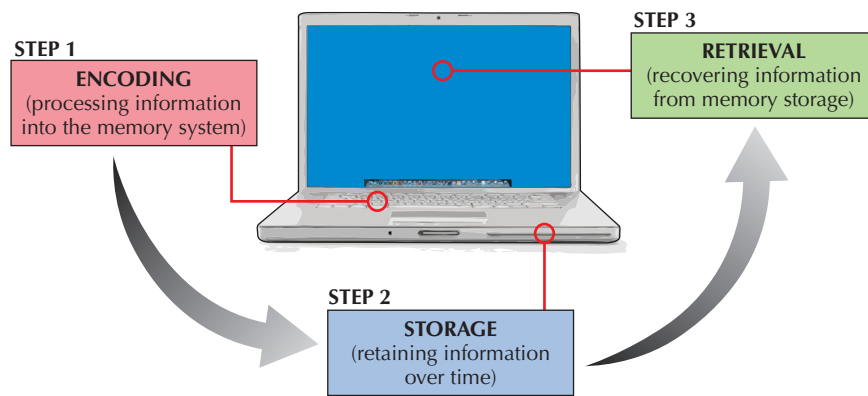


FIGURE 1.4 The Information Processing Model The information processing model can be said to have taken its inspiration from the way computers work. Like computers, our brains receive input, process it, store it, and produce output.

Reprinted with permission of John Wiley & Sons, Inc., from Huffman, K. (2012). *Psychology in Action* (10th ed.). Hoboken, NJ: Wiley, p. 250, Figure 7.1.

understanding **information processing theory** is to think of it as an attempt to explain what's going on in the human mind as it acquires, processes, retains, and comprehends information. Information processing theorists focus on *what* information children represent; *how* children represent, store, and retrieve this information; *how* these representations guide their behaviors; and *which* mechanisms lead to changes in these processes across development (Munakata, 2006). (Chapter 12 presents a more detailed discussion of attention and memory.)

Information processing theory offers specific and practical guidance to teachers and others who are helping children to learn, one of its key benefits. It provides a useful framework for analyzing the various processes involved in learning new information and for understanding difficulties children encounter in learning. Another advantage of this theory is the rigorous scientific approach favored by information processing researchers.

Learning Theories

Learning theory is a general term for theories that focus on the importance of learned behaviors in development. The leading proponents of the learning tradition in psychology are John Watson and B. F. Skinner, who introduced and developed behaviorism, and Albert Bandura, who created social learning theory. As you will see, all these theorists describe development more in terms of nurture rather than nature. In addition, all tend to view development as continuous.

Behaviorism

Behaviorism emphasizes observable behavior. The roots of behaviorism can be found in the work of Ivan Pavlov (1849–1936), a Russian physiologist. Pavlov (1927) was originally studying digestive processes in dogs when he noticed that the dogs salivated when a lab worker brought them food. Later he observed that the dogs also salivated when the lab worker was present even when he brought no food. The dogs had learned to associate one stimulus (food) with another (lab worker) and to respond in the same way to both. Pavlov later produced the same association using food and the sound of a bell. This association came to be known as **classical conditioning**.

The American psychologist John B. Watson (1878–1958) was intrigued with Pavlov's work. Watson believed that classical conditioning answered all our questions about human development and behavior. In Watson's eyes, humans are bundles of stimulus-response connections. He claimed that if adults turn their attention to infants early enough, the infants can become anything the adults want (Watson, 1930). He demonstrated this by teaching an infant, named Little Albert, to fear rats and other furry animals, even though Albert did not initially fear them. Watson did this by

Information processing theory A perspective that attempts to explain the mechanisms by which the human mind acquires, processes, retains, and comprehends information.

Behaviorism A theoretical orientation that emphasizes learning and focuses on observable behavior.

Classical conditioning A type of learning in which a neutral stimulus (such as the sound of a bell) comes to evoke a response (such as salivation) originally evoked by a different stimulus (such as the presence of food).



Nina Leen/Time & Life Pictures/Getty Images, Inc.

B. F. Skinner, in his theory of operant conditioning, proposed that organisms—including people—learn or change their behavior based on the consequences of that behavior.

associating furry animals with loud noises, unusual masks, and other events that naturally evoked fear. Eventually, Little Albert also developed fear of furry animals, a conditioned response. However, Watson’s view of learning turned out to be far too simple to explain many forms of behavior. (Note that the experiment just described would not be approved today, because it is now considered unethical to cause harm to a child, such as by making a child fearful. You will read more about the ethics of research later in this chapter.)

B. F. Skinner (1904–1990) expanded Watson’s ideas with his theory of operant conditioning (1953, 1974, 1983). Operant conditioning is a more complex concept than classical conditioning. In classical conditioning, a stimulus that already leads to a response is simply replaced by a different stimulus. In **operant conditioning**, behavior is learned or changed based on its consequences.

Operant conditioning relies on the concept of *reinforcement*, a consequence of a response that makes the original behavior more likely to occur in the future. Skinner identified two types of reinforcement: positive and negative. *Positive reinforcement* refers to a consequence *presented* after a response that makes that response more likely to happen in the future. For example, 4-year-old Natalia picks up her toys, and her father praises her warmly. His praise reinforces her action positively and makes it more likely that she will repeat picking up her toys in the future. *Negative reinforcement* refers to a consequence *removed* after a response that makes a desired response more likely to appear in the future (Skinner, 1953). This occurs, for example, when a teacher tells a class that if students complete all their assignments, they will not be required to take a test. In this example, the suggestion of the removal of the test makes it more likely that students will complete their assignments. (For a discussion of some practical applications of reinforcement, see the discussion of spanking in Chapter 10.)

Negative reinforcement is not the same as punishment. *Punishment* refers to an aversive action occurring after an undesired response (see Figure 1.5). For example, a teenager who stays out beyond an agreed-upon time might be punished by being “grounded.” Thus, one type of punishment, called *negative punishment*, involves the removal of something that the person being punished finds pleasant, such as going out with friends. In contrast, *positive punishment* involves the introduction of something a person finds unpleasant; for example, instead of being grounded, the teenager might be given additional chores.

As suggested earlier, Skinner’s version of behaviorism was very influential in the mid- to late- 20th century, and it is still important today in many areas. For example, operant conditioning principles are used effectively in both educational and therapeutic settings. One approach derived from this theory, *applied behavioral analysis*, is often used to teach children with autism spectrum disorders (Ahearn, & Tiger, 2013; Korn-Bursztyn, 2011; Matson, Tureck, Turygin, Beighley, & Rieske, 2012). A common criticism of behaviorism, however, is that behavior is often more complex than this theory

		The action causes the child’s behavior to.....	
		Increase	Decrease
A child engages in a behavior. Afterward, something is...	Added	Positive Reinforcement Parents praise a child who picks up toys.	Positive Punishment Parents scold a child who rides a bike without a helmet.
	Taken Away	Negative Reinforcement Teacher lets students who complete all homework in a unit skip the unit quiz.	Negative Punishment Parents “ground” or take away the privilege to go out, from a teen who stays out past curfew.

Operant conditioning A form of learning in which a behavior elicits certain consequences, which in turn make the behavior more or less likely to occur in the future.

FIGURE 1.5 Reinforcement and Punishment Positive reinforcement is a consequence presented after a response that makes that response more likely to repeat in the future. Negative reinforcement is a consequence removed after a response that makes a desired response more likely to repeat in the future. In contrast, punishment is an aversive action that occurs after an undesired response.

suggests (Seligman, 1970). Therefore, many aspects of behavior, such as the development of language, cannot be adequately explained according to its principles. Also, this theory fails to explain individual differences in behavior and disregards cultural influences (Escala, & Sánchez, 1977).

Social Learning Theory

Albert Bandura's (b. 1925) **social learning theory** broadened Skinner's ideas by introducing the idea of *modeling*. Bandura's expansion of learning theory has made it more powerful as a way to understand children's behavior. In Bandura's view, a child can learn a behavior by observing it in someone else (the *model*). He called this *observational learning*. Indeed, learning occurs through observing others even when the observers do not imitate the model's responses immediately and even when they obtain no reinforcement (Bandura & Walters, 1963).

In some of his more recent work, Bandura (1997, 2006) has focused on *self-efficacy*, one's belief that one can succeed in a given situation. Bandura's work in this area testifies to the power of children's belief that their actions will produce desired goals. A feeling of mastery and competence, based on successful performance, is a powerful motivational device that improves children's performance and makes them more willing to face riskier challenges (Fast et al., 2011; Mercer, Nellis, Martinez, & Kirk, 2011; Wang & Barrett, 2013). We discuss this work further in Chapter 10.



Albert Bandura's social learning theory introduced the idea of *modeling*, in which a child learns a behavior by observing it in someone else—the model.

Ethological Theories

Still another perspective emphasizes biological forces in development. This perspective was stimulated by the work of European zoologists during the mid-20th century. In a well-known experiment, Konrad Lorenz (1903–1989) studied the behavior of geese, which follow their mothers as soon as they hatch. Do the goslings actually know their mother? Lorenz (1965) developed a creative experiment to answer this question. He separated the eggs laid by one goose into two groups. The first group remained with the mother goose while the second was put into an incubator. When the goslings in the first group hatched, they followed their mother, as predicted. When the goslings from the second group hatched, the first moving object they saw was Lorenz, and they began to follow him. Even when the two groups were put together, the first group continued to follow the mother goose and the second continued to follow Lorenz. He termed this process **imprinting**, which is an innate form of rapid learning that involves attachment.

Lorenz believed that imprinting occurs during a **critical period**, a specific period of time during which a particular type of development must happen. If the development does not occur during the critical period, it will not occur at all. As you will see in later chapters, in humans there is little evidence of critical periods after birth. There are, however, **sensitive periods**, times when a particular experience (or lack of it) has a profound effect on development (Bagner, Pettit, Lewinsohn, & Seeley, 2010; Bruer, 2001). For example, the first few years of life appear to be a sensitive period for language development. During these years, most children readily develop the language to which they are regularly exposed. In contrast, children who have little or no exposure to language in their first few years have difficulty developing it fully at a later age (Newport, 1990).

How does Lorenz's insight into the behavior of geese relate to humans? John Bowlby (1907–1990) studied how human infants relate to their caregiver during their first few months of life. Drawing from Lorenz's work, he proposed that infants have a sensitive period for bonding with their caregivers. Bowlby (1980, 1989) proposed that



Konrad Lorenz discovered that baby geese follow the first moving object they see after they hatch—in this instance, Lorenz himself. He called this innate form of learning *imprinting*.

Social learning theory Bandura's version of learning theory, which emphasizes the role of modeling, or observational learning, in behavior.

Imprinting An innate form of rapid learning that involves attachment.

Critical period A particular period of time in which a biological or environmental event must happen, for typical development to occur.

Sensitive period A portion of time during which a particular experience (or lack of it) has a strong effect on development.

Bioecological model Bronfenbrenner's approach, in which the individual develops within and is affected by a set of nested environments, from the family to the entire culture.

Microsystem In Bronfenbrenner's bioecological model, the innermost environmental level (for example, home and school).

Mesosystem In Bronfenbrenner's bioecological model, the relationship among microsystems (for example, the interactions between home and school).

Exosystem In Bronfenbrenner's bioecological model, a system in which the developing child is not actually present but that influences the child's development (for example, social policies created by the government).

Macrosystem In Bronfenbrenner's bioecological model, the outermost environmental level, consisting of the child's culture and society.

Chronosystem In Bronfenbrenner's bioecological model, changes in ecological systems that are caused by time.

if the relationship between the caregiver and infant is positive during that period, the child will develop in an optimal way; but if the relationship is not positive, the child will likely have difficulty with social relationships later in life. We discuss this idea more in Chapter 7.

Systems Theories

So far, we have looked at four kinds of child development theories: psychoanalytic, cognitive, learning, and ethological. Of these, only Vygotsky's theory of sociocultural development takes much account of the influence of society and culture on development. We turn next to a more interactionist view in which children's development is seen as a result of interacting systems.

Systems operate according to particular principles. One of these principles is that the same developmental task can be reached by different routes. As you will see in Chapter 5, for example, not all toddlers learn to go down stairs in the same way, but they all do learn to go down stairs. A second principle is that when change occurs in one system, changes occur in other systems. The result is a new type of organization. For example, when children are first learning to write words, they focus on which letters make up each word. As they become practiced at writing words, a cognitive skill, they use writing to communicate with others and to learn about the ideas and feelings of others, a psychosocial skill. Thus, both systems have been changed.

Here we discuss two systems theories: Bronfenbrenner's bioecological model and developmental systems theory. The first focuses on the contexts that affect children's lives and, in turn, their development. The second places more emphasis on how children's genetic and biological makeup interacts with these various contexts. Both approaches, however, view children as agents in their own development. They are not simply passive recipients of the effects of the environment; rather, they interact with the environment (including other people) in ways that affect their development.

The Bioecological Model

Uri Bronfenbrenner (1917–2005) proposed a **bioecological model** of development in which individuals interact with five environmental systems. Bronfenbrenner visualized the environment as a set of nested structures, one inside the other, centered on the child, as shown in Figure 1.6:

- The **microsystem** includes the immediate settings in which children are nurtured and learn (including, for example, home, school, and peer groups).
- The **mesosystem** is the system of relationships among microsystems (for example, the interactions between home and school).
- The **exosystem** includes settings in which the child is not actually present but which influence a child's development. School boards are one example of such settings, as they enact social policies constructed at the federal, state, and local levels that affect children's experiences in schools. We discuss some of the most important of these social policies throughout this text.
- The **macrosystem** is the subculture and culture in which the child lives and which influence the child through broad social customs, attitudes, ideology, values, and so on.
- The **chronosystem** represents the passage of time. This element of Bronfenbrenner's model reminds us that changes occur in the other systems as time passes and the child grows and develops. For example, peers exert little influence on infants but a great deal on adolescents, so as time passes the influence of the microsystem of peers on the child expands.

Each system affects how the child develops, but the systems do not act independently. Rather, development emerges from the interactions *among* the systems (Bronfenbrenner & Morris, 2006). Furthermore, in later versions of his model,

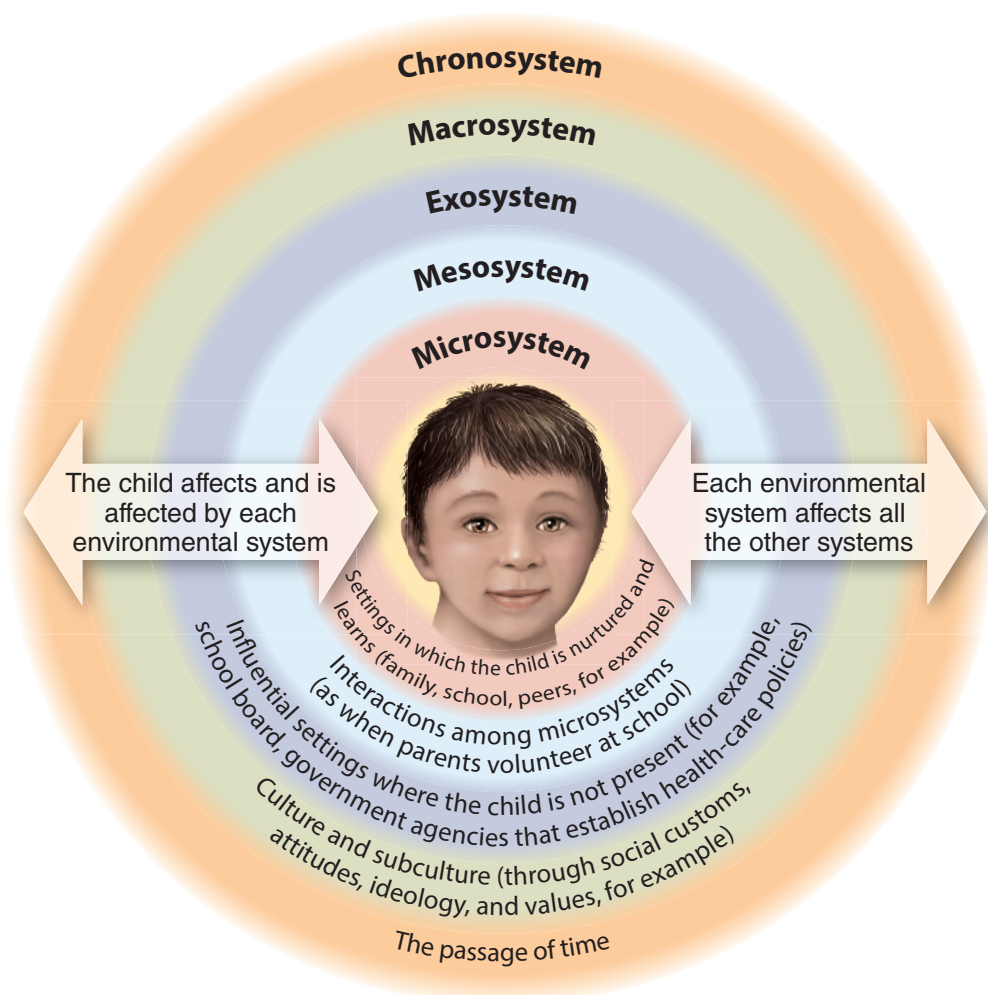


FIGURE 1.6 The Bioecological Model Bronfenbrenner visualized the environment as a set of nested structures centered on the child. Each element, including the child, affects and is affected by all the others.

Bronfenbrenner also discussed the child's own biological makeup (Bronfenbrenner & Morris, 2006), although the environmental contexts maintain a predominant role in this model (Gauvain & Parke, 2010).

Bronfenbrenner has given us a rich and complex vision of children's development. In particular, his model has emphasized examining the combination of *person*, *context*, and *process* to understand how children develop. In recent years, his theory has become increasingly important as developmental psychologists have become more interested in investigating cultural influences on development and in understanding how environmental differences affect children's well-being. His theory cannot be fully tested, however, due to its complexity. Instead, it is useful as a way to understand the many influences on children's development. (For more about Urie Bronfenbrenner, see the Focus On feature.)

Developmental Systems Theory

Developmental systems theory is a relatively new area based on the work of several theorists, including Gilbert Gottlieb (1997; Gottlieb, Wahlsten, & Lickliter, 2006), Richard Lerner (2006), and Arnold Sameroff (2009, 2010). Developmental systems theory is similar to the bioecological model in its recognition of the importance of multiple contexts in affecting children's development, but it differs from the bioecological model in at least two ways. First, it places more emphasis on the way biological

Developmental systems theory A theory emphasizing reciprocal interactions between the individual and multiple levels of the individual's environment; work based on developmental systems theory that examines interactions at four levels: genetic, neural, behavioral, and environmental.

Focus On: Urie Bronfenbrenner

In evaluating child development research, Urie Bronfenbrenner offered a crucial criticism that changed the field substantially. He argued that most researchers in child development studied children in artificial conditions, not in their natural daily lives. Children were brought into laboratories at universities, where they were asked to complete tasks while being observed or assessed by researchers they didn't know. Bronfenbrenner claimed that "much of contemporary developmental psychology is the science of the strange behavior of children in strange situations with strange adults for the briefest possible periods of time" (Bronfenbrenner, 1977, p. 513). His bioecological model derived from such concerns and attempted to remedy them by placing a greater focus on the contexts in which children live. He had a special interest in enhancing the development of children living in poverty. This led to his cofounding of the national Head Start program, a federally supported pre-school program for children from low-income families.

Cornell University Photography



In his bioecological model, Urie Bronfenbrenner emphasized the influence of the various contexts in which children develop.

systems operate. It does not reduce behavior to biological or genetic components, however. Instead, it recognizes that a child's biological makeup is affected by environmental influences. Indeed, the environment can affect even the molecular structure of a child's cells. Second, this theory, compared with bioecological theory, places more emphasis on *transactions*, which are bidirectional interactions among various systems. The theory identifies interactions at four levels: genetic, neural, behavioral, and environmental. Transactions begin to affect children's development very early in life. As a result of these constant transactions, all of us—children, adolescents, and adults—experience continual reorganization as we move through the life cycle (Lerner, 2006; Sameroff, 2009).

The developmental systems approach has stimulated much current work on gene-environment interactions. For example, some individuals have a particular gene associated with the development of depression, but not all of them become depressed as adolescents or adults; instead, they tend to become depressed only when they experience certain levels of stress (Caspi et al., 2003). Therefore, neither the presence of the gene nor the presence of stress alone predicts depression; their interaction does. We discuss this approach in greater detail in several later chapters.

Developmental systems theory is a general theory and, like bioecological theory, is difficult to test as a whole due to its complexity. Nevertheless, the idea that systems connect to each other in different ways and reorganize throughout development is a powerful one that we discuss throughout this text.

✓ CHECK YOUR PROGRESS

1. What are some differences between Freud's and Erikson's theories of development?
2. Explain the difference between assimilation and accommodation according to Piaget.
3. How does scaffolding relate to the ZPD from the perspective of Vygotsky?
4. What is a major difference in the way children's development is viewed from the perspectives of learning theories and ethological theories?
5. Give an example of each of the systems affecting a child's development according to bioecological theory.

Asking Questions, Examining Answers

[KEY QUESTION] 4. What specific research methods do psychologists use to learn about children's development?

As you have just read, theoretical perspectives help guide us in understanding how children develop. Psychologists use theory as they formulate the important questions to research, but they also use the results of research to test and advance theory. For example, researchers studying Piaget's theory have often found that children understand certain concepts about objects and abstract concepts much earlier than Piaget suggested (Baumard, Mascaro, & Chevallier, 2012), an issue we discuss in later chapters. These research findings have led to refinements in Piaget's theory. Thus, theory and research work together in advancing our knowledge of child development.

In this section, we discuss how psychologists conduct research. By research, we mean *empirical* investigations, systematic approaches that can be verified and replicated. We begin by discussing the scientific method. We follow by describing how researchers design their studies and gather data. The research discussed in these parts of the section generally involves *quantitative data*, data that can be converted into numbers. Some research, in contrast, yields *qualitative data*, information expressed in words. We discuss this type of research later in the section. Next, we consider how research findings are reported. We conclude with a discussion of ethical issues regarding research on children and adolescents.

The Scientific Method

Most studies in child development follow the scientific method, which is a standard way of conducting studies in all scientific fields. The scientific method follows six steps:

1. Formulate a question, usually based on a theoretical perspective.
2. Develop a *hypothesis*, or possible explanation, about the question (usually in the form of a prediction).
3. Choose a method for testing the hypothesis.
4. Analyze the data collected by the method to test the hypothesis.
5. Draw conclusions about the hypothesis.
6. Disseminate the results of the study so the study can be replicated or the hypothesis revised.

To illustrate, let's consider some research mentioned earlier in this chapter. Recall the study described previously in which psychologists compared how two groups of students perceived the same photographs (Chua et al., 2005; Norenzayan et al., 2007). In this study, the researchers formulated a question about whether individuals from different cultural groups would focus on the same aspects of photographs. The researchers' hypothesis (prediction) was that they would find differences between American and Chinese students. The method they chose to investigate their hypothesis involved showing all the students the same series of photographs under the same conditions and measuring their eye movements as they looked at them.

All the photographs contained a central object (such as a tiger) and a complex, realistic background (such as a jungle). Studying the eye movements of the students, the researchers found that the Americans focused more on the objects, whereas the Chinese looked more at the background. These results indicate that there are cultural differences in how individuals look at a photograph, and thus support the researchers' hypothesis.

Why might such differences matter? The researchers suggest that such differences in perception might explain what someone remembers about a scene or event.

Cross-sectional study A study that compares groups of children of different ages at a single point in time.

Longitudinal study A study that follows the same group of children over a substantial period of time.

Designing Research Studies

Researchers must design their studies based on the specific questions they plan to investigate. This decision involves two issues. First, the researchers must decide whether the participants in their research will be studied at one point or over time. Then they must decide on the specific research design to use.

Three Approaches to the Study of Age-Related Developmental Differences

One of the first questions child development researchers ask is: Should our study compare children of different ages, or should it follow the same group of children over time? This is an especially important question because child development research often focuses on understanding developmental differences and what accounts for them. Clearly, comparing, say, 5-year-old Ernesto with 10-year-old Kofi might yield different results than comparing what Ernesto was like at 5 with what he is like at 10. There are three major research approaches to studying age-related differences in children: cross-sectional studies, longitudinal studies, and cross-sequential studies.

CROSS-SECTIONAL STUDIES. A **cross-sectional study** compares children of different ages. For example, suppose we want to study whether children's patterns of friendship change at different ages. One way to study this is simply to compare and analyze the friendships of 4-year-olds, 7-year-olds, and 10-year-olds. Cross-sectional studies are efficient because they allow researchers to make age-related comparisons with only one sample of data from each age point. They lack the capability, however, to determine how stable individual differences might be or how individual change might occur. For example, do young children who are outgoing have different friendship patterns in adolescence from young children who are shy?

LONGITUDINAL STUDIES. A **longitudinal study** follows the same group of children over a lengthy period of time, often several years. The same elements of development are recorded at specific intervals during the study.

A LONGITUDINAL STUDY OF COMMUNICATION SKILLS One longitudinal study followed a group of children with biologically based disabilities (Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001). The researchers assessed children's communication skills (for example, their ability to communicate with others through talking, using sign language, and writing) at five age points over a 10-year period. They found that, as they expected, the children's communication skills improved over time. They also found that communication skills increased at a greater rate for children whose mothers had interacted with them in more positive ways during early childhood. This finding suggests that paths of development (that is, patterns of change over time) may differ for children based on the ways mothers interact with them when they are young.

Everyday stories

Because they involve following the same participants over time, longitudinal studies are usually more time-consuming than cross-sectional ones. They may take many years to complete and involve the complexities of finding and assessing the same individuals over that period of time. They may also suffer from *cohort effects*. A cohort is a group of people of the same age growing up during the same time period. Sometimes large-scale events—such as a war, famine, natural disasters, economic changes, and even technological advances—can affect an entire cohort, but the effects are not known unless the cohort can be compared with a similar cohort growing up at a different time period. That said, longitudinal studies do offer two advantages over cross-sectional studies: (1) They enable researchers to assess whether children stay the same or change in relation to particular characteristics, such as skills in communicating. (2) They allow

researchers to examine hypotheses about what might predict change to occur—for example, mother-child interactions.

CROSS-SEQUENTIAL STUDIES. Psychologists sometimes combine longitudinal and cross-sectional approaches into a single study called a **cross-sequential study**. The framework is similar to a cross-sectional study in that it involves studying groups of children of different ages—for example, three groups of children, at ages 4, 7, and 10. It is like a longitudinal design in that it involves following those children for several years (see Figure 1.7).

An advantage of this approach over a longitudinal study is that it can take fewer years yet answer the types of questions examined in both longitudinal and cross-sectional studies. In the preceding example, suppose you are interested in learning about children’s tendency to be shy or outgoing. You could study each group of children for only six years but still produce information on children from ages 4 to 16 (a span of 12 years). If you are interested in examining individual differences, you

Cross-sequential study A study that combines the cross-sectional and longitudinal approaches. In a cross-sequential study, two or more age groups are tested at two or more points in time.

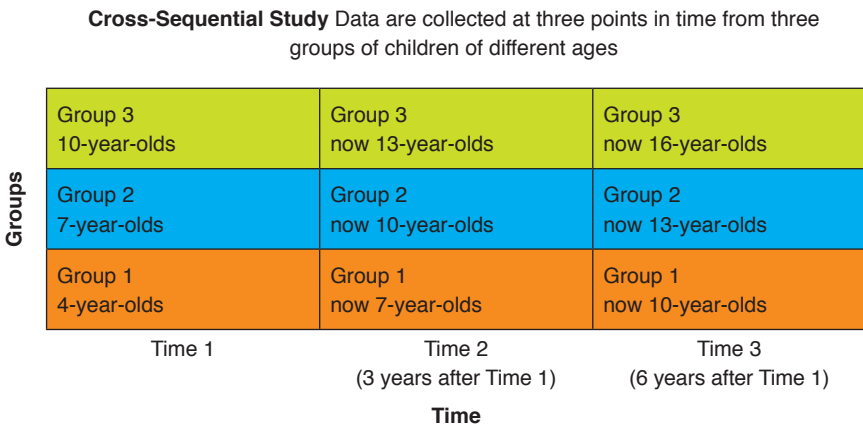
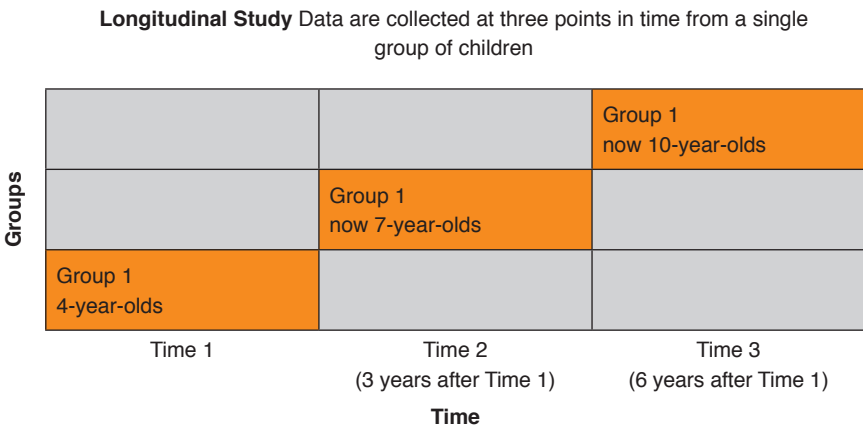
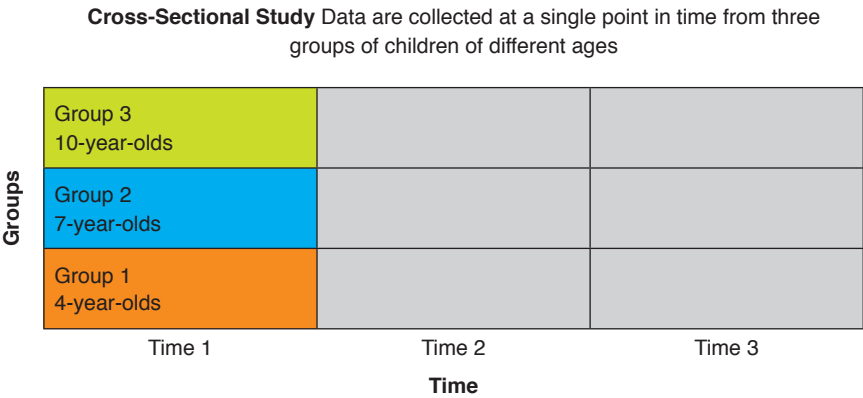


FIGURE 1.7 Three Research Designs Cross-sectional, longitudinal, and cross-sequential studies represent three different ways to make age comparisons among research participants. (Gray areas in the figures indicate times when no data are collected.)

Table 1.7 Ways of Studying Age-Related Differences in Children

Approach	Description	Strengths	Weaknesses
Cross-sectional	Children of different specific age groups are compared.	Efficient; less costly than the other two approaches; can investigate age-group comparisons.	Cannot investigate how individual children change.
Longitudinal	Children of one initial age group are followed over time.	Can track how children change and investigate predictors of change.	Expensive; cannot detect cohort effects.
Cross-sequential	Children of different specific age groups are followed over time.	More efficient than longitudinal approaches; can investigate how children change, as well as age-group and cohort differences.	More expensive than a cross-sectional study.

could ask whether a child who is shy at age 4 is also shy at ages 7 and 10. If you are interested in making age comparisons, you could see whether children are more outgoing at certain ages. Another advantage is that you can study cohort effects by comparing children who, for example, turned age 7 during the first year of the study with those who turned age 7 three years into the study.

Table 1.7 summarizes the three main ways of studying age-related differences in children.

Research Designs Using Quantitative Data

Beyond determining how age-related differences will be studied, researchers following the scientific method need to choose how they will design their studies to obtain the most accurate results. In this section, we discuss the five most common research designs in child development that make use of quantitative data: descriptive studies, correlational studies, experimental studies, quasi-experimental studies, and microgenetic studies.

DESCRIPTIVE STUDIES. Descriptive studies simply record behavior. They do not aim to discover what causes the behavior. For example, earlier in this chapter, we cited a recent study that analyzed media use by children ages 8 to 18 (Rideout et al., 2010). This is a descriptive study, as it documents the types of media children of various ages use. It, like many descriptive studies, is valuable because it provides general information that researchers might use to report trends in behavior and to develop future studies about why some children engage in media use more than others.

CORRELATIONAL STUDIES. Correlational studies are more complex than descriptive studies. They involve analyses of whether and to what extent certain variables are associated. *Variables*, in psychological studies, are the characteristics or behaviors that are being studied. Associations between variables allow us to make predictions. For example, suppose we know of two 5-year-old boys, Pedro and Eric, and we know that Pedro is taller than Eric. Now suppose we need to make a prediction about which one weighs more, without knowing anything else about them. To make this prediction, we can use the fact that a child’s height and weight are often *correlated*, or associated.

To establish a correlation, researchers record the height and weight of a large number of 5-year-old boys. Next, they develop a statistic called a *correlation coefficient* that describes the degree of association between two variables. The correlation coefficient ranges from -1.00 to $+1.00$; the higher the numerical correlation, regardless of whether it is positive or negative, the stronger the association between the two variables. A value of 0 means that there is no correlation at all. Figure 1.8 shows some types of correlations. Note that a correlation can be either positive or negative. Thus, a correlation of $-.87$ is as strong as a correlation of $+.87$. For the association between height and weight, the correlation is positive, which means that taller people tend to weigh more. What is an example of a negative correlation? Research has identified a negative correlation between maternal cigarette smoking

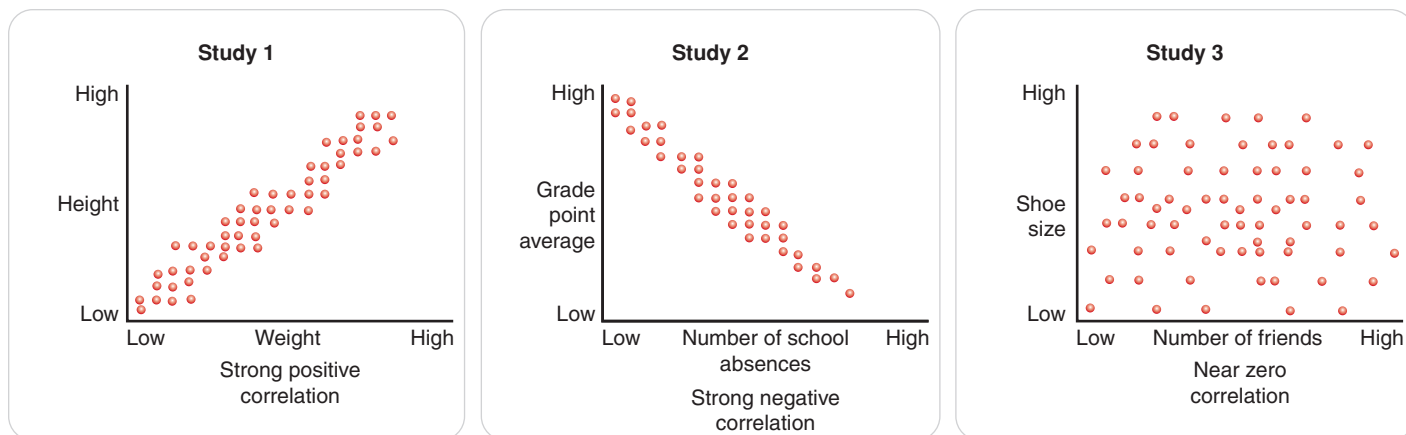


FIGURE 1.8 Examples of Correlations The graphs show three different types of correlation between scores on variable A (say, height) and variable B (say, weight). The variables display a strong positive correlation in study 1, a strong negative correlation in study 2, and no correlation in study 3.

Adapted with permission of John Wiley & Sons, Inc., from Comer, R., & Gould, E. (2013). *Psychology Around Us* (2nd ed.). Hoboken, NJ: Wiley, p. 50, Figure 2.5.

during pregnancy and infant birth weight (Centers for Disease Control, 2007; Tayie & Powell, 2012): As the number of cigarettes mothers-to-be smoke during pregnancy increases, children's birth weight decreases (Dalenius, Brindley, Smith, Reinold, Grummer-Strawn, 2012; Kramer et al., 1990).

You may be thinking that the research just mentioned indicates that cigarette smoking during pregnancy *causes* low birth weight. But that is not the case. A correlational study cannot tell us whether one variable causes another, because it cannot rule out other explanations. For example, women who smoke cigarettes during pregnancy may also drink alcohol or make other lifestyle choices that affect their newborns. Based only on the correlational study, we just can't tell. Thus, as you read about studies in which correlations have been found, keep in mind that there may be multiple explanations for that correlation. It is also important to keep in mind that correlation does not equal causation.

what if...?



A friend of yours really enjoys exercising, although you exercise only grudgingly. He makes many claims about the value of exercise, including arguing that it improves his grades. He decides to do a study to investigate this hypothesis. He creates an online survey for college students in which he asks a series of questions, including the number of hours each respondent exercises each week and his or her grade point average. Using the responses he receives, he calculates a correlation between these two variables and finds it to be $+0.30$, which means that students who reported exercising more also reported having higher grades. He shows you these results and says, "See! That proves my point. If you exercise more, you will get higher grades, so you better start exercising." What do you say to him?

EXPERIMENTAL STUDIES. The only way researchers can study causation is through an experimental study. An *experiment* is a carefully controlled study in which the variable of interest is manipulated while other factors are held constant. Among experimental studies, the **randomized controlled trial** is considered the "gold standard." In this type of study, researchers randomly assign individuals to groups. One group, called the *experimental group*, is exposed to the manipulated variable of interest, while the other, called the *control group*, is not. If the researchers then observe differences between the groups, they can assume that the manipulated variable caused these differences.

Let's consider some of the elements of the randomized controlled trial. First, what does it mean to assign individuals to groups randomly? Random assignment simply means that every person in the pool of possible participants has an independent and

Randomized controlled trial An experimental study in which researchers randomly assign individuals to either an experimental or a control group and expose the experimental group to the manipulated variable of interest.

Independent variable The variable that a researcher expects to cause changes in the dependent variable.

Dependent variable The variable measured to determine whether it is affected by the independent variable in an experiment.

Quasi-experiment An experimental study in which participants are not randomly assigned to groups but in which one group is exposed to the manipulated variable of interest.

Microgenetic studies Studies in which researchers observe the same children over a short period of time to document how their behavior is changing.

equal chance of being assigned to either group. An independent chance means that the selection of one person from the group will not affect the probability that another person might be selected. This practice is meant to ensure that the two groups are equivalent at the beginning of the study in terms of all other variables that might affect the study's outcome (even those a researcher might not be aware of), since these variables should be randomly distributed across the two groups.

Experiments involve two types of variables: an independent variable and a dependent variable. The **independent variable** is the one that the researchers manipulate. The **dependent variable**, often called the *outcome* or *criterion variable*, is the one that they measure to determine whether it is affected by the independent variable. For example, suppose you are interested in how children develop reading skills. You want to determine whether reading stories with an adult is a more effective intervention in helping children to develop reading skills than watching a video of the same story, another possible intervention. As illustrated in Figure 1.9, the independent variable in this study is assignment to the intervention—either the reading group or the video group. You will want to make sure that children are randomly assigned to these groups. Next, you will implement the experimental *intervention*; that is, you will in some way treat the two groups differently. In this case, you will have parents read a story with their children, or have children watch a video of the same story with their parents. Next, you will assess all the children's reading skills. Then you will analyze the difference in the skills for the children in the two groups. Finally, you will state a conclusion based on the analysis.

If randomized controlled trials are so effective in studying causation, why don't we use this research design all the time? For one thing, it is often not feasible to do so. We cannot randomly expose individuals to many of the conditions that we suspect have significant influences. Specifically, it is not ethical to expose individuals to situations that may harm them, even if we do not have data proving that the situations actually *cause* the harm. For example, we would not want to randomly assign pregnant women to a group and instruct them to smoke cigarettes just to determine whether smoking cigarettes causes low birth weight. We discuss such ethical issues later in this chapter.

QUASI-EXPERIMENTS. Because random assignment is often unethical or infeasible, researchers sometimes use a design called a **quasi-experiment** that has some, but not all, characteristics of experimental studies. In a quasi-experiment, two or more groups are compared on the dependent variable, but participants are not randomly assigned to the groups. For example, suppose you are interested in comparing a new reading curriculum with the one currently used. For practical reasons, you may not be able to randomly assign individual students to the new curriculum model (the independent variable). You may, however, be able to try these approaches in two different existing classrooms. At the end of the study, you would measure reading scores in the two classrooms—the dependent variable.

The problem with this approach is the absence of random assignment. One group may begin the study higher or lower on the dependent variable than the other. Researchers conducting a quasi-experimental study use statistical means to take into account any lack of equivalence in the groups' initial characteristics. Still, such approaches are not as strong as those in which the study starts out with equivalent groups. Thus, we cannot say with certainty that these studies establish cause and effect.

MICROGENETIC STUDIES. **Microgenetic study** designs provide an in-depth description of a process that involves change (Flynn & Siegler, 2007; Siegler & Jenkins, 1989). In microgenetic studies, researchers observe the same children many times over a short period of time, usually days or weeks, to document their process of change (Benigno, Byrd, McNamara, Berg, & Farrar, 2011). The method is particularly well suited to study detailed changes in children's strategies when they are learning a new task. For example, some researchers have studied how young children learn that plants, like animals, are living things (Opfer & Siegler, 2004). At first, many children think that only some plants are living things—flowers, for example, but not trees. As children learn that all plants need water, can grow, and are capable of movement, they begin to realize that plants are living things. The microgenetic approach is helpful for documenting the

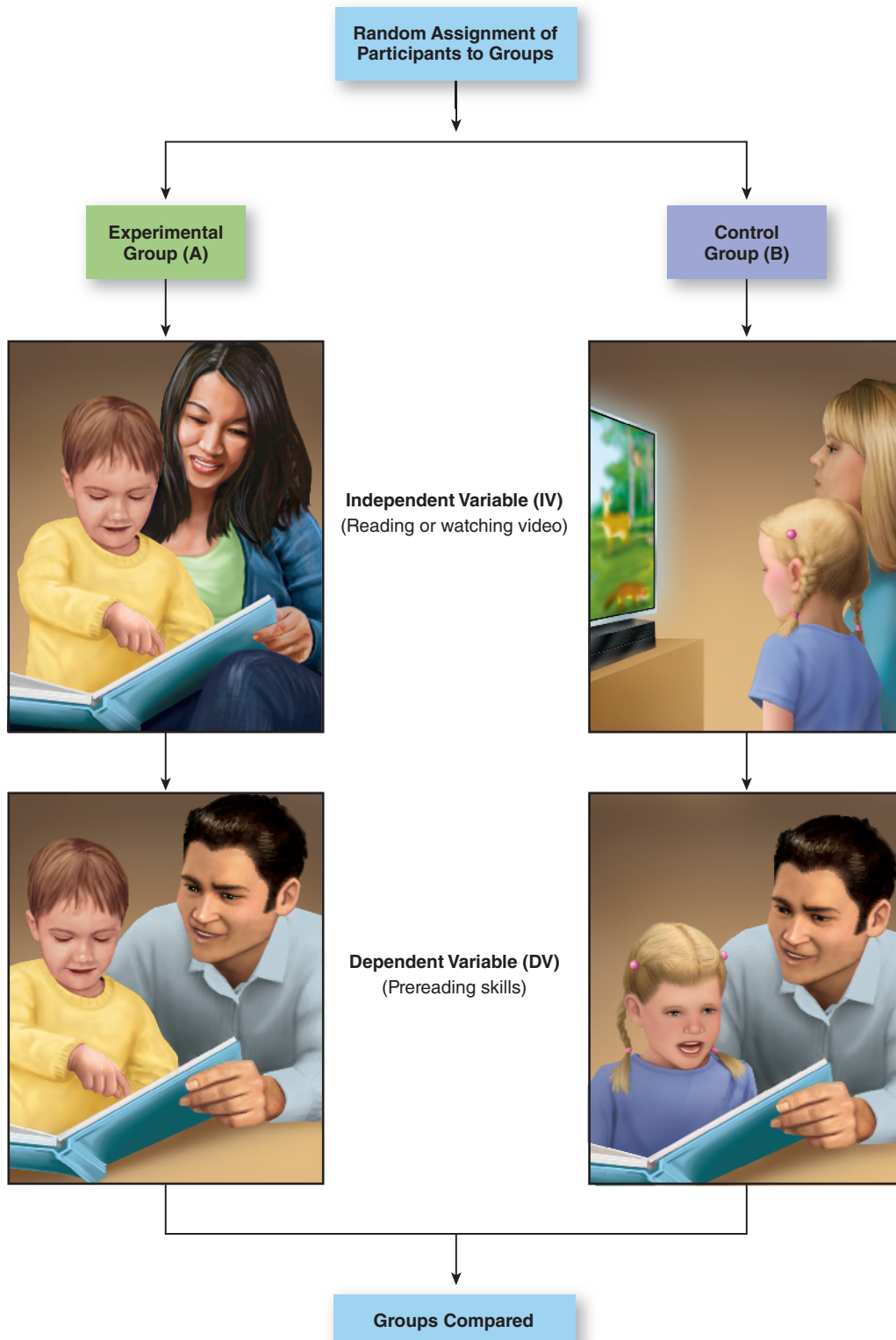


FIGURE 1.9 Steps in Randomized Control Trials To test whether reading a story with an adult is more effective in helping children to develop reading skills than watching a video of the same story, researchers would follow these steps: (1) Randomly assign child-parent pairs to group A (parent reads story to child) or group B (parent and child watch video of story). (2) Instruct the groups either to watch the video or read the story. (3) Have the children's reading skills assessed by a researcher who does not know which group the children are in. (4) Compare the results for the two groups. (5) Conclude whether the story-reading group had higher reading skills, as hypothesized.

Adapted with permission of John Wiley & Sons, Inc., from Carpenter, S., & Huffman, K. (2010). *Visualizing Psychology*. Hoboken, NJ: Wiley, p. 17, Figure 1.10.

Table 1.8 Strengths and Weaknesses of Major Research Designs

Design	Features	Strengths	Weaknesses
Descriptive study	Records basic information with no attempt to determine how variables relate.	Can provide baseline information about an aspect of development.	Does not provide information that can be used to make predictions.
Correlational study	Examines how two or more variables are associated.	Can yield predictions concerning one variable based on information concerning the other variable.	Cannot establish that one variable causes another.
Experimental study	Using randomly assigned participants in experimental and control groups, manipulates an independent variable and measures the effect on a dependent variable.	Enables researchers to assess whether the independent variable causes differences in the dependent variable.	Is not always ethical or possible to randomly assign participants to groups.
Quasi-experimental study	Examines differences in a dependent variable based on group membership, but does not randomly assign participants to groups.	Enables researchers to examine group differences when random assignment is not possible.	Does not allow causal conclusions to be made about group differences.
Microgenetic study	Examines changes in a small group of children over a short period of time.	Provides a detailed analysis of the sequence of developmental change.	Does not reach conclusions about what causes change.

process by which learning occurs and is useful in providing suggestions of how to enhance learning. However, it does not address the causes of the changes being observed.

Table 1.8 summarizes the research designs that we have discussed in this section. As you can see, each has strengths and weaknesses.

Research Designs Using Qualitative Data

Although many studies in child development use quantitative data and follow the scientific method, approaches using qualitative data are also important and add valuable information to our understanding of children and families. We discuss two approaches here: ethnographic studies and case studies.

ETHNOGRAPHIC STUDIES. **Ethnography** is a qualitative research approach that has given us important insights into various cultural groups. In general, ethnographic methods are derived from anthropology. Researchers may, for example, conduct open-ended interviews and then write narrative reports summarizing the themes and patterns that they have found. Their aim is to capture the experiences and perceptions of the people being studied and to understand the meaning these people give to daily activities. Ethnographers focus on understanding people’s experiences in everyday life, rather than on creating experimental conditions. Because researchers employing an ethnographic approach do not begin with a hypothesis, they are open to exploring and understanding the experiences of individuals in a holistic way.

One example of this type of research was conducted by Barbara Rogoff. Rogoff (2003) studied children living in a Mayan community in Guatemala and detailed how they participated in the everyday routines of community life. In a rich description of the community and its routines, she chronicled how mothers simplified various tasks, like making tortillas, so children of various ages could participate in them. Studies like this one are useful in exploring how the ideologies and values of a cultural group relate to patterns of child rearing. They are usually rich in detail and suggest questions for further analysis. We discuss Rogoff’s study further in Chapter 9.

CASE STUDIES. The **case study** method is often used to gather in-depth information about a particular individual. A case study combines a range of data sources, such as interviews, test results, and observations. Clinical psychologists often use this method to develop an intervention or treatment plan. Research psychologists might use it to understand individuals with unusual traits or diagnoses. Although case studies have provided

Ethnography A qualitative research approach that aims to capture the experiences and perspectives of the people being studied, and to understand the meaning these people give to daily activities.

Case study Detailed information gathered about a particular individual.

remarkable insights, they are limited by their focus on a single individual. They lack external validity because we can't generalize from that individual to a whole group.

Collecting Data

Psychologists use a range of techniques to collect data about children's development. Three frequently used approaches are observational studies, self-reports, and assessments.

Observational Studies

Psychologists often use techniques of observation; that is, they gather information about children by observing what children do. In some cases, psychologists, especially those using ethnography, observe children in a natural setting, such as home or school (Puroila, Estola, & Syrjala, 2012). In other cases, they bring children into the laboratory for observation.

Wherever observation takes place, it is important that it be systematic so it can be replicated. If more than one observer is collecting data, it is essential that all observers collect data in the same way from all participants. Otherwise, of course, the data will not be comparable. One way to keep observation systematic is to use a written form that specifies the information observers should collect. Observers are trained to use the form before the observation takes place. For example, trained observers might use a form to record observations of how parents teach toddlers to put on a jacket. Observational studies like this one often provide findings that relate to children's typical everyday experiences. One weakness of observational studies, however, is that children behave differently when they know they are being observed.

Self-Reports

You have probably been asked to relate information at some point, perhaps in a school or job application, using the technique of self-report. There are several types of self-reports, including various types of interviews and questionnaires. Let's consider questionnaires here as a common example of a self-report. Psychologists often use questionnaires that have been developed to measure a construct such as self-esteem or behavior problems. Parents may report on young children's attributes in such questionnaires. In middle childhood and adolescence, however, subjects are increasingly asked to complete the questionnaires themselves.

Questionnaires—as well as certain other instruments, such as assessments—are analyzed to make sure that they have good validity and reliability. **Validity** refers to the degree to which an instrument measures what it is intended to measure. If a questionnaire is said to measure children's self-esteem but only asks questions about children's reading skills, it would have poor validity. **Reliability** refers to consistency. A questionnaire might be considered reliable if, say, a child filled it in several times over a period of a few days and gave very similar responses each time.

One problem with self-reports is that individuals sometimes are not completely honest (Bekkers, & Wiepking, 2011; Hoza, Vaughn, Waschbusch, Murray–Close, & McCabe, 2012; Sintov & Prescott, 2011). Children responding to questionnaires may, for example, give the answer they believe will be most socially acceptable to adults. Moreover, as you will read in Chapter 14, adolescents may actually exaggerate such behavior as their level of sexual activity.

Assessments

Another way to collect data from children is to assess their performance using a test. Assessments are often *standardized*, meaning that they have a uniform set of procedures for administration and scoring. This allows researchers to compare the performance of one child on the assessment with that of another child.

Validity The extent to which an instrument measures what it claims to measure.

Reliability The extent to which an instrument produces consistent measurements.



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This psychologist is gathering information about children by observing them in their classroom. Psychologists often use observation in their studies.

Table 1.9 Strengths and Weaknesses of Three Methods of Gathering Information

Method	Description	Strengths	Weaknesses
Observation	Children’s behavior is watched and recorded based on pre-determined categories.	Provides a direct source of information about children’s typical behavior.	Children may alter their typical behavior when they know they are being observed.
Self-report	Participants are asked to report on various aspects of their behavior using interviews or questionnaires.	Allows individuals to present their perspectives on how they think or feel.	Participants sometimes are not truthful or are reluctant to answer certain types of questions.
Assessment	Children are asked to perform a task or respond to a set series of questions.	Allows the performance of individuals to be compared.	Children’s performance on any assessment may differ from their typical behavior in a natural setting.

Assessments need to be developed carefully so they are valid. For example, as we discuss in Chapter 12, many psychologists claim that some intelligence tests are not valid because they do not assess all aspects of intelligence. Like questionnaires, assessments also need to be reliable, or consistent. If you assess a child on reading skill today and again tomorrow, you would expect the child’s results on the test to be about the same on those two days.

Physiological measures are increasingly being used in conjunction with assessments (Nelson, 2011; Urion, 2009). *Neuroimaging*, like functional magnetic resonance imaging (fMRI), is one type of physiological measure. Researchers use it to construct images of a person’s brain and biochemical activity. Neuroimaging is often used in combination with a cognitive assessment to show which parts of the brain have increased activity when undertaking certain tasks (Cédric, Koolschijn, & Crone, 2013; Prat, 2013 Sowell, Thompson, & Toga, 2007; Wilcox, Stubbs, Hirshkowitz, & Boas, 2012).

Table 1.9 summarizes the observation and self-report methods of gathering information.

Reporting Research Results

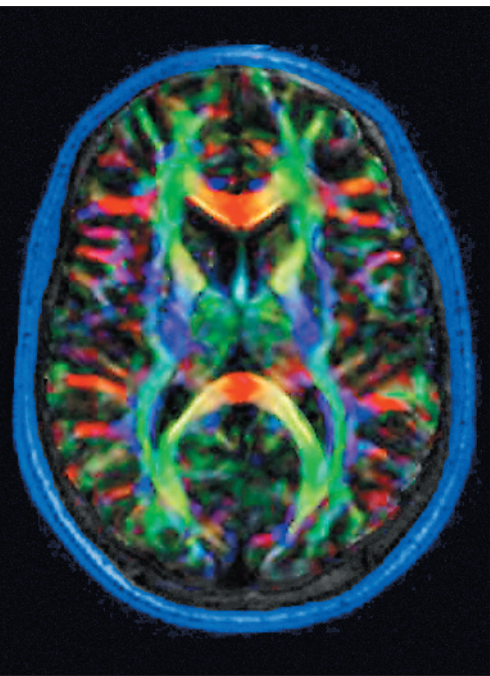
After completing a study, it is important that researchers report the results, even when the results do not support their hypotheses. One reason to publish findings from a study is so that others can replicate, or reproduce, and extend that study. In this section, we first look briefly at the publication of research. Next, we consider how researchers summarize the results of an entire set of studies on a particular topic.

Publication of Research Studies

Many research studies are published in journals, published by professional organizations such as the American Psychological Association, the Society for Research in Child Development, the American Educational Research Association, and the American Academy of Pediatrics, to name only a few. Many journals can be accessed online through PsychINFO (for studies in psychology) and MEDLINE (for studies on health) or at the library in most colleges and universities.

Most journals established by professional organizations are overseen by an editorial board of experts who evaluate submitted research articles before sending them on to additional experts for *peer review*. Peer review means than an article is being evaluated by others in the same field of research. Such a review is usually “blind,” meaning that the reviewers do not know who wrote the article, a process intended to prevent bias in the review process.

The articles must be written in accordance with a particular structure. First, there is an *abstract*, a brief summary of the article. It is helpful to read the abstract first, to determine whether the article is of interest to you. The *introduction* follows, describing the main questions the research is addressing, along with prior research relevant to those questions. Third is the *methods* section, where the authors describe their research design, participants, and data collection, including the measures they used. Fourth is the *results* section, where the researchers report their analyses of the data. Finally, in the *discussion* section, the researchers offer their conclusions and integrate them with prior research. They also acknowledge limitations of the research, and make suggestions for future research studies on this topic. At the end of the article are the *references*, a list of the bibliographic sources the researchers consulted for the article.



ISM/Phototake

Psychologists today often use neuroimaging techniques, like the fMRI shown here, to investigate which parts of the brain are active during certain tasks. This image shows connections between brain regions.

Summaries of Research Studies

Research journals often contain summaries of research results; we refer to such summaries in this book. The literature review and the meta-analysis are two methods that psychologists use to summarize a group of studies on the same topic.

A *literature review* provides a narrative discussion of the various studies. It summarizes what is known, discusses gaps in the research evidence, describes the limitations of the various studies (such as use of correlational rather than experimental designs), and offers suggestions for future work. Such reviews are useful because they provide an opportunity to learn about an entire area of research. Even a well-constructed literature review, however, is limited by the quality of the studies reviewed.

A *meta-analysis* is similar to the literature review in that it focuses on the compilation of a series of studies on a particular topic. It differs from a literature review in that it involves combining the quantitative results of each study and results in a quantitative summary of the entire set of studies. Meta-analysis has the advantage of providing quantitative information on a large group of studies. Like the literature review, however, it is limited by the quality of the individual studies themselves.

Ethical Considerations Policy

Any psychologist who conducts research on individuals needs to consider ethical issues. This is especially true when the research involves children. Researchers need to consider both the potential risks and the potential benefits to children and make sure that the benefits outweigh the risks. Two professional organizations, the American Psychological Association (2002) and the Society for Research in Child Development (2007), are among many that have developed guidelines for ethical practices. Three of the most important principles are the following:

1. *Do no harm.* Be sure that the research will not harm children, either physically or psychologically.
2. *Obtain informed consent.* All participants should be told about all aspects of the research in language that is appropriate for them. When children are participants, parents need to be informed and asked to approve their child's participation, in writing. When children are old enough to understand the purpose of the research, generally around 7 years of age, assent needs to be gained from them, too (Sibley, Sheehan, & Pollard, 2012). Children also need to be told that they can quit the research project or refuse to participate in any part of it at any time without consequence.
3. *Ensure the confidentiality of information gathered from participants.* Individual anonymity must be preserved in all writings about the research process or findings.

The importance of conducting research in ethical ways has led universities and hospitals to convene committees, called institutional review boards (IRBs), that review research for ethical concerns. Research at colleges or universities must be approved by the IRB before faculty or students may conduct any aspect of a study. IRBs also require researchers to report any negative consequences that occur during the research process. The report of such consequences may cause the IRB to require that the research be stopped or changed significantly.

CHECK YOUR PROGRESS

1. In what ways is a cross-sequential design preferable to either a cross-sectional or longitudinal design?
 2. Explain the following statement: "Correlation does not mean causation."
 3. Why might a researcher need to conduct a quasi-experimental study rather than an experimental study?
 4. Why is it important to select measures that are both valid and reliable?
 5. Describe three principles for conducting ethical research studies.
-

CHAPTER SUMMARY

Children and Their Development

[KEY QUESTION] 1. What are some of the key issues in understanding development?

- Developmental psychologists have been careful to distinguish development from change. Development is change that is systematic, organized, and successive in character.
- Developmental psychologists typically divide their analysis into three domains: biological, cognitive, and psychosocial. Interactions among the elements of these domains are generally complex and multidirectional.
- Age alone reveals little about the underlying mechanisms of development.
- Two of the most important and persistent issues in development have concerned nature-nurture interaction and continuity versus discontinuity. In the case of nature and nurture, most psychologists today agree that these two critical forces interact at every level.

A Child's Journey in the 21st Century

[KEY QUESTION] 2. How has modern society affected child development and its study?

- Families, and parenting itself, are in a state of flux today. To understand the steady development of children's abilities and accomplishments in the midst of change demands an analysis of the many interactions that are at the heart of the developmental process.
- Research on the influence of families on development has shifted from focusing solely on individual parents to studying the family as a social system.
- The important effect of a child's cultural community on development is widely recognized today. A great deal of research supports the idea that human development is a cultural process.
- Children today live in an expanding technological world, one that reaches into every aspect of development.

Explaining Development: The Theories

[KEY QUESTION] 3. How would you describe the major theories of child development?

- In their attempts to explain how children develop, psychologists and others have proposed many and varied theories of development.
- Freud's psychoanalytic theory explains personality development in terms of five psychosexual stages. Erikson's psychosocial theory proposes eight stages of development and focuses on the effects of social interactions. Freud's theories are less influential than there were in the early 20th century, whereas Erikson's ideas remain popular.
- Cognitive theories of development include those of Piaget, Vygotsky, and information processing theorists. Piaget's stage theory of cognitive development describes how children construct knowledge through adaptation and organization. Piaget had a significant influence for many years on studies of children's

thinking. Vygotsky was interested in social and cultural influences on development, especially how children construct knowledge with the help of others. This perspective remains important today. Information processing theorists focus on how the human brain receives input, processes it, and produces output. Information processing theory has produced specific and practical guidance in many areas of cognition.

- Learning theories have a long and rich tradition in American psychology. John Watson's ideas about classical conditioning proved too simple to explain much about behavior in children. B. F. Skinner, in contrast, expanded and enriched learning theory by introducing the idea of operant conditioning, in which behavior depends on consequences. Skinner's ideas were very influential in the mid- to late- 20th century, and they are still important today, especially in educational and therapeutic settings. Albert Bandura's social cognitive learning theory broadened Skinner's ideas by introducing the idea of modeling—that is, learning by observing others.
- Bronfenbrenner's bioecological theory of development focuses on how individuals interact with five environmental systems as they develop. In recent years, his ideas have become increasingly important.
- Developmental systems theory focuses on reciprocal interactions between the individual and the environment. Work based on this theory examines interactions at four levels: genetic, neural, behavioral, and environmental. Like bioecological theory, it offers a rich and complex view of development.

Asking Questions, Examining Answers

[KEY QUESTION] 4. What specific research methods do psychologists use to learn about children's development?

- When conducting quantitative research, developmental psychologists follow the scientific method, which includes six steps: formulating a question, developing a hypothesis, choosing a method for testing the hypothesis, analyzing the collected data, drawing conclusions about the hypothesis, and disseminating the results.
- In designing a study, researchers must decide how to study age-related differences and which specific research methodology to use. Ways to study age-related differences in children include the cross-sectional, longitudinal, and cross-sequential approaches. The typical research methodologies incorporating quantitative data that are used in developmental psychology are descriptive studies, correlational studies, experimental studies, quasi-experimental studies, and microgenetic studies. Two types of studies that use qualitative data are the ethnographic study and the case study.
- Research information can be gathered in a variety of ways. Three of the most commonly used data collection methods are observational studies, self-reports, and assessments. Summaries of a set of research studies can be presented in a narrative literature review or a meta-analysis, which includes a quantitative analysis of findings. The value of either type of summary depends on the quality of the individual studies being summarized. Researchers must follow a professional code of ethics in conducting all aspects of psychological research.

KEY TERMS

Behaviorism 23	Development 5	Information processing theory 23	Psychoanalytic theory 16
Bioecological model 26	Developmental psychology 5	Longitudinal study 30	Psychosocial domain 6
Case study 36	Developmental systems theory 27	Macrosystem 26	Psychosocial theory 18
Chronosystem 26	Discontinuity 8	Mesosystem 26	Quasi-experiment 34
Classical conditioning 23	Enculturation 12	Microgenetic studies 34	Randomized controlled trial 33
Cognitive domain 6	Ethnography 36	Microsystem 26	Reliability 37
Continuity 8	Exosystem 26	Nature 8	Sensitive period 25
Critical period 25	Imprinting 25	Nurture 8	Social learning theory 25
Cross-sectional study 30	Independent variable 34	Operant conditioning 24	Sociocultural theory 21
Cross-sequential study 31		Physical domain 5	Stage theories 8
Culture 12			Validity 37
Dependent variable 34			

CRITICAL THINKING QUESTIONS

- 1. Children and Their Development.** Describe and use examples to explain what is meant by the claim that “development implies change but change does not necessarily imply development.”
- 2. A Child’s Journey in the 21st Century.** Analyze ways in which the use of media technology can be detrimental and, conversely, ways in which it can be advantageous to a child’s development.
- 3. Explaining Development: The Theories.** We have compared the major child development theories in this chapter. Which theories do you consider to have greater value for understanding children’s learning? Why?
- 4. Asking Questions, Examining Answers.** In examining the different approaches to conducting research on children’s development, it is apparent that each is better suited to a different type of question. In what ways do experimental studies differ from other approaches in relation to the questions they address?
- 5. Cultural Perspectives.** Contrast the various types of assistance and support two different families might seek in parenting their child with a disability based on their ethnotheories about their child’s disability.

REAL Development

A Child’s Journey

Welcome to Wiley’s Real Development! This media program, based on the experiences of four real-life families, invites you to observe the pivotal stages of child development through the eyes of family members. Over the course of the term, your instructor may assign activities from this program that you will complete online. After viewing the video, you will engage in activities that will allow you to take on various roles and tasks related to children and their development.

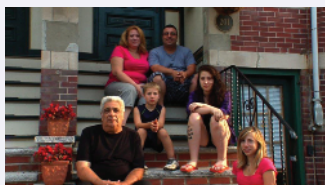
In this module, you will have the opportunity to meet our families and learn a little about them and their lives.

Anthony and Lynn Borelli and their three children, Mikayla (age 15), Jenna (age 14), and Anthony Jr. (age 9)

Matt and Julianne Gray, their 4-year-old daughter Adeline, and their (soon-to-be-born) daughter Olivia

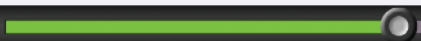
Barry and Tia Wagner and their six children, Terrell (age 11), Tocarri (age 9), Olivia (age 7), Benjamin (age 5), Brandon (age 1), and Shyairah (age 2 months)

Erica Ramirez, who is expecting her first child



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