

Key Questions/ Chapter Outline

Core Concepts

Psychology Matters

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Infancy: Building on the Neonatal Blueprint

- Newborns have innate abilities for finding nourishment, avoiding harmful situations, and interacting with others—all of which are genetically designed to facilitate survival.

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Remarkable reports of similarities in twins raised apart from each other may grab our attention, but do they necessarily point to genetics as the primary cause of human thinking and behavior?

Critical Thinking Applied:

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chapter 6 development over the lifespan



What could grab media interest more effectively than a story of twins separated at birth and reunited as adults? Many such tales have emerged from psychologist Thomas Bouchard's famous twin-study project at the University of Minnesota. But what really attracts journalists are the reports of uncanny similarities between identical twins who were raised by different parents, taught by different teachers, influenced by different peers and siblings, and sometimes even raised in different cultures.

Take, for example, the "Jim Twins." Separated just a few weeks after they were born, identical twins Jim Springer and Jim Lewis were adopted separately and raised apart. Yet something drove them on parallel paths, even though those paths didn't cross again for 39 years. At their reunion, the "Jim twins" discovered some remarkable correspondences in their habits, preferences, and experiences. Some examples:

- They achieved nearly identical scores on tests of personality, intelligence, attitudes, and interests.

- Medically, both have mildly high blood pressure and have had spells that they mistakenly thought were heart attacks; both have had vasectomies; both suffer from migraine headaches.
- Both chain-smoke Salem cigarettes and drink Miller Lite beer.
- Both had been indifferent students: Jim Lewis had dropped out in the tenth grade, while Jim Springer had managed to graduate from high school.
- Both had been married twice, and both of their first wives were named Linda. Both of their second wives were named Betty. Both men like to leave love notes around the house.
- Lewis had three sons, including one named James Alan. Springer had three daughters, plus a son named James Allan.
- Both had owned dogs named Toy.
- Both drive Chevrolets, chew their fingernails, like stock-car racing, and dislike baseball.
- Both had been sheriff's deputies.
- Both do woodworking as a hobby. Lewis likes to make miniature picnic tables, and Springer makes miniature rocking chairs. Both had built white benches around trees in their yards.

When he first read about the two Jims in a newspaper, Bouchard knew their case presented a rare opportunity to study the relative effects of heredity and environment and how they unfold over time in the process we call development (Holden, 1980a,b; Lykken et al., 1992). The Jims agreed to participate and so became the first of some 115 pairs of reunited twins (plus four sets of reared-apart triplets) to be studied over the next 20 years at the University of Minnesota.

Another remarkable pair, Oskar Stör and Jack Yufe, was also separated at birth, and from that point on their lives went in almost unbelievably different directions. Stör was raised by his grandmother in Czechoslovakia and attended a Nazi-run school during World War II, while Yufe was taken to Trinidad, where he was raised as a Jew by his biological father. Oskar is now married, a strong union man, and a devoted skier, while Jack is separated, a businessman, and a self-styled workaholic. Still, alongside these huge differences, the researchers again found some striking similarities in seemingly trivial behavior patterns. Both twins wear neatly clipped moustaches; both read magazines from back to front; both have a habit of storing rubber bands on their wrists; both flush the toilet before using it; both like to dunk buttered toast in coffee; and both think it is funny to sneeze loudly in public.

PROBLEM: Do the amazing accounts of similarities in twins reared apart indicate that we are primarily a product of our genes? Or do genetics and environment work together to influence growth and development over the lifespan?

As compelling as these stories are, we must interpret them with care (Phelps et al., 1997). Let's begin that interpretation by putting on our critical thinking caps and asking some important questions:

- Are these twin stories representative of all twins reared apart, or are they exceptional cases?

- When we notice striking similarities between biological relatives—whether they be twins, siblings, or parent–child relationships—what factors other than genetics might account for these similarities?
- Are there methods by which we can reliably tease out the differences between the genetic contributions and the influences of the environment to make an accurate determination of the relative contribution of each?

These fascinating questions are just part of what we'll explore in our study of development across the lifespan. Broadly speaking, **developmental psychology** is the psychology of growth, change, and consistency from conception to death. It asks how thinking, feeling, and behavior change through infancy, childhood, adolescence, and adulthood. It examines these changes from multiple perspectives—physical, emotional, cognitive, and sociocultural. Furthermore, it seeks to understand how both heredity and environment influence these changes. *The primary questions for developmental psychologists, then, are these: How do individuals predictably change throughout the lifespan, and what roles do heredity and environment play in these changes?*

This issue of heredity and environment is important, so let's take a closer look at it. Psychologists call this the **nature–nurture issue**: As you know from the two previous chapters, nature refers to the contribution of our heredity, whereas nurture refers to the role of our environment. In earlier years, the nature–nurture question was an either-or question, but modern researchers have a more sophisticated understanding of this complex issue (Bronfenbrenner & Ceci, 1994; Dannefer & Perlmutter, 1990). Today the nature–nurture issue recognizes that both nature and nurture play a role in almost all aspects of human behavior (de Waal, 1999), and questions (1) what the relative weight of each of these factors is and (2) how the two factors might interact to ultimately produce a given characteristic.

What do we mean by interact? Simply put, *nature–nurture interaction* means that we are all born with certain predispositions (*nature*) that, if exposed to the proper experiences in our environment (*nurture*), can reach their full potential. If you are good at, say, math or music, your ability is really the result of a combination of genetic potential and experience. Heredity establishes your potential, but experience determines how your potential will be realized. To put it yet another way: Nature proposes, and nurture disposes.

Still, we may ask: Which of our traits does heredity affect most? And which are most heavily influenced by learning or other environmental factors (such as disease or nutrition)? While more and more information is becoming available to help answer these questions, we must be cautious in our interpretation of these findings. For example, we know that in the genetic disorder known as Down's syndrome, biology has a strong influence. In this condition, the output of abnormal chromosomes leads to mental retardation—and there is no cure. The hazard of knowing about the genetic basis for Down's syndrome is that the parents or teachers of children with such disorders may simply conclude that biology determines the child's destiny and give up hope. By focusing on the genetic side of the disorder, they may overlook effective learning-based treatments that can measurably improve the living skills of these individuals.

Mindful of such dangers, psychologists have nevertheless forged ahead in the study of hereditary and environmental contributions to thought and behavior. To do so, they have invented several clever methods for weighing the effects of nature and nurture. **Twin studies** represent one such method. The work of Thomas Bouchard, for example, with twins separated at birth and then reunited, offers some tantalizing clues about the relative contribution of nature and nurture. This type of twin set, however, is a scarce resource. Far more common are twin sets raised together, and fortunately, psychologists have figured out how to learn from these twins as well. Because *identical twins* have essentially the same genotype and *fraternal twins* have (on the average) 50% of their genes in common,



Harry Potter is a good illustration of the nature–nurture interaction. Born to pure-bloods (parents with magical powers) but raised by muggles (people without magical abilities), his own magic didn't flourish until he entered the magic-supporting environment of Hogwarts School.

Developmental psychology The psychological specialty that studies how organisms grow and change over time as the result of biological and environmental influences.

Nature–nurture issue The long-standing discussion over the relative importance of nature (heredity) and nurture (environment) in their influence on behavior and mental processes.

Twin study A means of separating the effects of nature and nurture by which investigators may compare identical twins to fraternal twins or compare twins separated early in life and raised in different environments.

CONNECTION • CHAPTER 1

The control group in a study serves as a standard against which other groups can be compared.

hereditary effects should show up more strongly in identical twins. (In studies comparing these two twin types, the fraternal twins serve as a sort of control group.) Such studies have given us valuable information on the genetics of mental and behavioral disorders, including alcoholism, Alzheimer's disease, schizophrenia, depression, and panic disorder (Eley, 1997; Plomin et al., 1994).

Yet a third method used to measure the effects of heredity and environment is **adoption studies**. If you adopted a baby, would he or she grow up to resemble you more than the biological parents? Researchers in adoption studies compare the characteristics of adopted children with those of their biological and adoptive family members. Similarities with the biological family point to the effects of nature, while similarities with the adoptive family suggest the influence of nurture. This work, in concert with twin studies, has revealed genetic contributions to a variety of psychological characteristics, such as intelligence, sexual orientation, temperament, and impulsive behavior—all of which we will see in more detail elsewhere in this book (Bouchard, 1994; Dabbs, 2000).

6.1 KEY QUESTION

WHAT INNATE ABILITIES DOES THE INFANT POSSESS?

People used to think that babies began life as a “blank slate”—with an empty brain and no abilities. In modern times, however, that picture has changed. We now see newborns as possessing a remarkable set of abilities acquired through their genes. They are adept at locating food and avoiding potential harm, and their social nature facilitates their survival as well. We focus on these inborn or **innate abilities** in the Core Concept for this section:

core concept

Newborns have innate abilities for finding nourishment, avoiding harmful situations, and interacting with others—all of which are genetically designed to facilitate survival.

To be sure, the newborn's capabilities are limited, but they are effective enough to promote survival. You arrived in the world already “knowing,” for example, how to get nourishment by suckling, how to raise your hands to shield your eyes from bright light, and how to get attention by cooing and crying. Still, it is helpful to think of the newborn's basic abilities as a sort of scaffold to which new and more complex abilities are added as the child grows and develops.

To explain where these abilities come from and how they develop, we will organize our discussion around three important developmental periods: the *prenatal period*, the newborn or *neonatal period*, and *infancy*. You will notice that, in each phase, development builds on the abilities and structures laid down earlier.

Adoption study A method of separating the effect of nature and nurture—by which investigators compare characteristics of adopted children with those of individuals in their biological and adoptive families.

Innate ability Capability of an infant that is inborn or biologically based.

Prenatal period The developmental period before birth.

Zygote A fertilized egg.

Prenatal Development

The **prenatal period** is a time of furious developmental activity between conception and birth that readies the organism for life on its own outside the womb. Development typically occurs over the span of nine months and is divided into three phases: the germinal, embryonic, and fetal stages.

Three Phases of Prenatal Development Shortly after conception, the fertilized egg, also known as a **zygote**, begins to grow through cell division. During this *germinal phase*, one cell becomes two; two become four; and when the number reaches about 150—about a week after conception—the zygote implants itself in the lining of the uterus. At this point, it (along with those cells that will form the

placenta and other supportive structures) becomes an **embryo**. It is now connected to the mother's body and thus affected by anything she eats, drinks, or to which she is otherwise exposed.

During the *embryonic phase*, the genetic plan determines how all the organs that will later be found in the newborn infant begin to form. In this stage, a process known as differentiation causes the embryo's cells to begin to specialize as components of particular organ systems. (Before differentiation, certain cells in the embryo, known as embryonic stem cells, are capable of forming into any organ of the body.) One example of differentiation is the development of anatomical sex: If the embryo's genetic plan contains two X chromosomes, the child will be a girl, but if it contains an X and a Y chromosome, a boy will develop.

At first, the embryo's cells form distinct layers. Those in the outer layer become the nervous system and the skin. Cells in the middle layer become muscles, bones, blood vessels, and certain internal organs. Those in the inner layer differentiate on a path that will eventually make them into the digestive system, lungs, and glands. By the end of the first month, the initial single cell of the zygote has developed into millions of specialized cells—in an embryo about the size of a grain of sand. Eventually this process of cell division and differentiation, which continues throughout the prenatal period, produces all the tissues and organs of the body.

The first rudimentary “behavior”—a heartbeat—appears in the fifth week and, a few weeks later, the embryo makes reflexive responses to stimulation. These behaviors occur long before the brain has developed to the point where it can think or direct behaviors. Between this time and the tenth week, the major organs and structures of the body will rapidly begin to form, making it especially sensitive to the effects of drugs and other harmful substances.

After the eighth week, the developing embryo is called a **fetus**. In the *fetal stage*, spontaneous movements and basic reflexes begin to appear. For example, as early as 14 weeks, some babies can be seen on ultrasound to curve their hands around something that comes in contact with their palm (Sparling et al., 1999). This is the beginning of the grasping reflex, and it has adaptive significance. By the sixteenth week, the brain is fully formed and the fetus can feel pain (Anand & Hickey, 1987). The baby can hear sounds from outside the womb by the twenty-seventh week, resulting in the ability to recognize certain sounds and rhythms shortly after birth. The brain will continue to develop, growing new neurons at the amazing rate of up to 250,000 per minute. At birth, the newborn's brain contains some 100 billion neurons (Dowling, 1992).

Teratogens: Prenatal Toxins During prenatal development, the **placenta** is the organ that surrounds the embryo/fetus. It serves as a conduit between mother and child, letting nutrients in and waste out, and can also screen out some—but not all—potentially harmful substances. Some toxic substances, called **teratogens**, still get in and can cause irreparable damage. Teratogens include viruses (such as HIV, the AIDS virus), certain drugs and other chemicals, and even some herbs. Among the most common teratogens are nicotine and alcohol.

Fetal alcohol syndrome (FAS) is one of the more worrisome disorders that can occur in children of mothers who drink alcohol during pregnancy. A leading cause of mental retardation, FAS may also cause babies to have poor motor coordination, impaired attention, and hyperactivity. Mothers who drink one or more drinks per day risk fetal alcohol exposure, which has been found to impair development of language ability, memory, learning, and a host of other cognitive and physical functions (Office of the Surgeon General, 2005). Furthermore, a recent series of studies at the University of Pittsburgh indicates that even minimal exposure—in some cases fewer than five drinks per week—can result in lower IQ and significantly retarded physical development: At age 14, children who had been exposed to even light alcohol consumption in utero weighed on



As the brain grows in the developing embryo, it forms as many as 250,000 new neurons per minute.

Embryo In humans, the name for the developing organism during the first eight weeks after conception.

Fetus In humans, the term for the developing organism between the embryonic stage and birth.

Placenta The organ interface between the embryo or fetus and the mother. The placenta separates the bloodstreams, but it allows the exchange of nutrients and waste products.

Teratogen Substance from the environment, including viruses, drugs, and other chemicals, that can damage the developing organism during the prenatal period.

Fetal alcohol syndrome (FAS) A set of physical and mental problems seen in children whose mothers drink excessive amounts of alcohol during pregnancy.

average 16 pounds less than children whose mothers had abstained from alcohol during pregnancy (Day, 2002; Willford, 2006).

Exposure to nicotine, and even to some commonly taken herbs and supplements, can also damage the developing fetus. Women who smoke during pregnancy are more likely to have children with lower birth weight, learning deficits, and ADHD (Button et al., 2005). Maternal smoking is also associated with greater risk of sudden infant death syndrome (SIDS) (Bruin et al., 2007). Even some popular herbal remedies and supplements, such as ginkgo and ginseng, have been found to have detrimental effects on a developing fetus (Chan et al., 2003; Dugoua et al., 2006).

The Neonatal Period: Abilities of the Newborn Child

By the time a newborn arrives in the world, then, a great deal of neural and sensory development has already taken place. (The term **neonatal period** refers to the first month after birth.) This current understanding of the newborn's sensory awareness is a far cry from the "great blooming, buzzing confusion" that experts once thought characterized the newborn's world (James, 1950/1890). Indeed, more recent research has revealed that newborns have all five senses working, as well as a variety of behavioral reflexes that they use to respond to and manipulate their environment. Together, these many abilities effectively help newborns survive and thrive in their environment.

Sensory Abilities in the Newborn What exactly can newborns do with their senses? For one thing, they can respond to taste: the sweeter the fluid, the more continuously and forcefully an infant will suck (Lipsitt et al., 1976). For another, they smile when they smell banana essence, and they prefer salted to unsalted cereal (Bernstein, 1990; Harris et al., 1990). They recoil, however, from the taste of lemon or shrimp or the smell of rotten eggs. And, as early as 12 hours after birth, they show distinct signs of pleasure at the taste of sugar water or vanilla. All these responses are part of the newborn's ability to seek healthy nourishment—as the Core Concept for this section suggested.

Just as heredity biases newborns' tastes, it also programs a preference for human faces to most other visual patterns (Fantz, 1963). Even their neonatal nearsightedness helps: Their optimal focus of about 12 inches is ideally suited for looking at faces. By just a few days after birth, they can recognize their mother's face. Their distance vision, however, is poor, with a visual acuity of about 20/500 (which means that they can discriminate at 20 feet stimuli that most older children can see clearly at 500 feet). These immature systems develop very rapidly (Banks & Bennett, 1988), however, and by about seven weeks, the infant has acquired the visual pathways and motor coordination to be able to maintain eye contact with a caregiver—an important element in establishing a relationship.

What else can newborns do with their senses? Although they can see colors, their ability to differentiate colors, such as red from orange from blue, becomes dramatically better a month or two after birth (Teller, 1998). They also prefer to look at objects with a high degree of contrast, such as checkerboards or target shapes. By three months, the baby can perceive depth and is well on the way to enjoying the visual abilities of adults. Moreover, it may surprise you to know that infants seem to possess a rudimentary ability to "count" objects they see. They know, for example, the difference between two dolls and three (Wynn, 1992, 1995). Such core knowledge serves as the foundation for the later development of more complex skills, such as are required for arithmetic (Spelke, 2000).

Newborns also have strong auditory preferences, preferring human voices over other sounds and the sounds and rhythms of their own language to non-native languages (Goodwyn & Acredolo, 2000). Before assuming these prefer-

Neonatal period In humans, the neonatal (newborn) period extends through the first month after birth.

ences are genetic, though, we must recall that the developing fetus can hear sounds from outside the womb during the last few months in utero. Thus, an alternate interpretation would be that these auditory preferences are due to prior exposure to human voices and their native language. To distinguish whether these preferences are genetic or environmental, one study had expectant mothers read *The Cat in the Hat* aloud twice a day for the last six weeks of their pregnancy; then, after the babies were born, the researchers played audiotapes of the mothers reading that story as well as a different story. The findings? Babies expressed an overwhelming preference for the sound of the familiar story being read over the sound of a different story. Neonates also display greater attraction to female voices than to those of men, and within a few weeks of birth they begin to recognize their mothers' voice (Carpenter, 1973; DeCasper & Spence, 1986). Thus, nurture—by way of prior experience—may be the driving force behind these newborn auditory preferences.

Social Abilities Have you ever noticed that if you stick your tongue out at a baby, he will stick his tongue out back at you? This delightful game reveals just one of many behaviors that researchers are finding newborns and infants will mimic. While in the past, some child development experts wondered if this reflected an in-depth cognitive understanding of the other person's behavior, the recent discovery of *mirror neurons* offers a more realistic explanation. Mirror neurons in the motor cortex fire in response to another person's goal-directed behavior and motivate an immediate “mirroring” response on the part of the observer. **Mimicry** of a variety of behaviors, like other innate abilities we have discussed, helps the infant survive and thrive in the environment.

As the foregoing discussion suggests, infants are built for social interaction. In fact, they not only respond to, but also interact with, their caregivers from the moment of birth. Film studies of this interaction reveal an amazing degree of **synchronicity**: close coordination between the gazing, vocalizing, touching, and smiling of infants and mothers or other caregivers (Martin, 1981). And while babies respond and learn, they also send out their own messages to those willing to listen to and love them. The result of this interaction can be seen in studies showing how the feelings of mothers and infants are coordinated (Fogel, 1991). So, a 3-month-old infant may laugh when her mother laughs and frown or cry in response to her display of negative emotion (Tronick et al., 1980).

Innate reflexes Aside from their sensory abilities and mimicry, babies are born with a remarkable set of **innate reflexes** that provide a biological platform for later development. Among these reflexes, the *postural reflex* allows babies to sit with support, and the *grasping reflex* enables them to cling to a caregiver. The *rooting reflex* can be seen when newborns turn their heads toward anything that strokes their cheeks—a nipple or a finger—and begin to suck it. And if you have ever noticed that when you hold a baby upright over a solid surface, her legs will lift up as if she were marching, you've witnessed the *stepping reflex*, which helps prepare a baby to walk. There are also a number of reflexes that act as built-in safety features to help them avoid or escape from loud noises, bright lights, and painful stimuli. And in their cooing, smiling, and crying, babies have some effective tools for social interaction. All of this, of course, makes much evolutionary sense because these abilities are highly adaptive and promote survival.

Infancy: Building on the Neonatal Blueprint

Following the neonatal period, the child enters **infancy**, a period that lasts until about 18 months of age—the time when speech begins to become better developed. (The Latin root *infans* means “incapable of speech.”) It is a time of rapid, genetically programmed growth and still-heavy reliance on the repertoire of

CONNECTION • CHAPTER 2

Mirror neurons activate regions in our brains that correspond to actions or mental states we perceive in others.

Mimicry The imitation of other people's behaviors.

Synchronicity The close coordination between the gazing, vocalizing, touching, and smiling of infants and caregivers.

Innate reflex Reflexive response present at birth.

Infancy In humans, infancy spans the time between the end of the neonatal period and the establishment of language—usually at about 18 months to 2 years.

CONNECTION • CHAPTER 9

“Instinct” is a common but imprecise term that refers to behaviors that have a strong genetic basis.

reflexes and “instinctive” behaviors that we discussed above. All of these abilities arise from a nervous system that continues to develop at a breathtaking pace.

Neural Development While the prenatal brain was focused on producing new brain cells, many of these neurons are not fully connected to each other at birth. This helps explain why most people have a poor memory for events that occurred before they were about 3½ years of age (Bauer, 2002; Howe & Courage, 1993). To take the next steps in forming the brain’s circuitry, stimulation from the environment assumes an important role in creating and consolidating connections. Each time an infant is exposed to a new stimulus, dendrites and axons actually grow and branch out to facilitate connections between the neurons involved in that experience (Kolb, 1989). The more frequently the fledgling neural connections are utilized, the more permanent they become. In other words, “neurons that fire together, wire together” (Courchesne et al., 1994).

Sensitive Periods The early years are the most fertile time for brain development in many areas, including language and emotional intelligence. In fact, in some domains—such as hearing and vision—stimulation must occur during a specific “window of opportunity,” or the ability will not develop normally (Lewis & Maurer, 2005; Trainor, 2005). This is called a **sensitive period** in development. Evidence for sensitive periods comes from, for example, a study of adults who were born profoundly deaf. Some of them learned American Sign Language (ASL) early in life, whereas others didn’t learn it until much later. (Parents of the late learners had focused their initial efforts on teaching the children to speak and lip-read, but the children had been unable to acquire spoken language due to their profound deafness.) Those who didn’t learn ASL—their first learned language—until adolescence or adulthood never reached the level of competency with the language as did the children who had learned it in early childhood (Mayberry, 1991; Singleton & Newport, 2004). You might feel some connection to this finding if you ever tried to learn a new language as an adult—it was probably far more difficult than it would have been if you’d learned it as a child!

Brain Development As the dendrites and axons grow and connect, the total mass of neural tissue in the brain increases rapidly—by 50% in the first two years. By 4 years of age, it has nearly doubled its birth size. For the next ten years, the types of experiences the infant is exposed to will largely determine which regions and functions of the brain become most developed. The genetic program (along with the physical limitations imposed by the size of the skull) does not allow the tremendous growth of brain circuitry to continue indefinitely, however. The neural growth rate gradually diminishes; and, by about 11 years of age, the brain attains its ultimate mass. Around that time, unused connections begin to be trimmed away through a process called **synaptic pruning**. Notably, this process does not destroy the neurons themselves but instead returns them to an uncommitted state, awaiting a role in future development (Johnson, 1998).

Maturation and Development Sitting, crawling, and walking—like the growth of the brain, the growth spurt of puberty, and the onset of menopause—all occur on their own biological time schedules. Psychologists use the term **maturation** for the unfolding of these genetically programmed processes of growth and development over time. When organisms are raised under adequate environmental conditions, their maturation follows a predictable pattern. In humans, maturation generates all of the sequences and patterns of behavior seen in Figure 6.1.

We must, however, keep in mind the role of the environment and how it interacts with our hereditary nature. While maturation dictates the general time frame in which an individual becomes biologically ready for a new phase, the environment can speed up or slow down the exact time of development. Prominent biologist Edward Wilson (1998, 2004) describes this principle as a **genetic leash**. Because of the genetic leash, a child without special training learns to walk fol-

Sensitive period A span of time during which the organism is especially responsive to stimuli of a particular sort. Organisms may have sensitive periods for exposure to certain hormones or chemicals; similarly, they may have sensitive periods for learning language or receiving the visual stimulation necessary for normal development of vision.

Synaptic pruning The process of trimming unused brain connections, making neurons available for future development.

Maturation The process by which the genetic program manifests itself over time.

Genetic leash Edward Wilson’s term for the constraints placed on development by heredity.

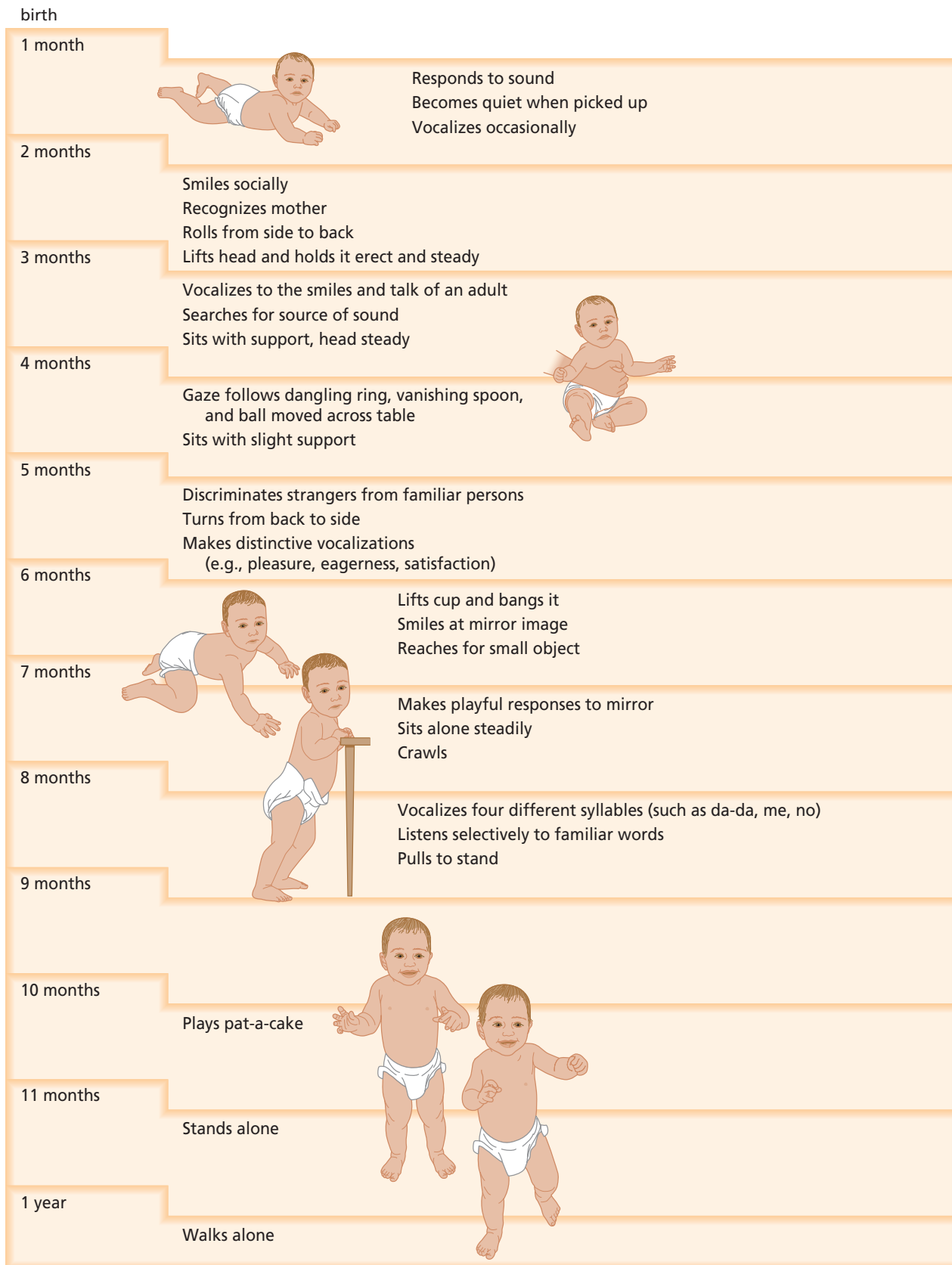


FIGURE 6.1
Maturation Timetable for Motor Control

This figure shows average ages at which each behavior is performed. There are considerable individual differences in the *rate* of development, so the time at which each response occurs is variable. Most infants, however, follow the *sequence* of development outlined here.



One of Harlow's monkeys and its artificial terry-cloth mother. Harlow found that the contact comfort mothers provide is essential for normal development.

lowing a time-ordered pattern typical of all physically capable members of our species. (See Figure 6.1.) Indeed, in the Hopi culture where children are carried in cradle boards, walking occurs on a similar schedule (Dennis & Dennis, 1940). Children who do receive special training, though, can learn to walk up to several months earlier, a finding illustrated in several African cultures who make a habit of bouncing babies on their feet, which speeds development of their leg muscles and motor control (Gardiner et al., 1998). And at the other extreme, children in Iranian orphanages who received little human contact and little opportunity to leave their cribs were significantly slower in learning to walk (Dennis, 1960).

The concept of the genetic leash can be useful to us as we continue to study the various patterns of human development. It eloquently illustrates the inescapable interaction between nature and nurture that is so fundamental to understanding how and why people develop as they do. We will see examples of this interaction throughout our study of language and cognitive development, social development, moral development, and emotional development—and moreover, in all major stages of the human lifespan.

Contact Comfort As infants develop greater sensory and motor abilities through both nature and nurture, they rely on their caregivers to provide the necessary stimulation. One type of stimulation that we haven't yet discussed is the importance of touch. In the first half of the nineteenth century, many experts thought that infants sought physical contact with their caregivers only as a means to an end—with the end being food or nourishment. Beyond providing the necessary nourishment, these “cupboard theory” proponents argued, infants derived no further benefit from physical contact. Psychologists Harry and Margaret Harlow disagreed (Harlow, 1965; Harlow & Harlow, 1966) and tested their theory using infant monkeys who had been separated from their mothers at birth. The Harlows placed orphaned baby monkeys in cages where they had access to two artificial surrogate mothers. One was a simple wire figure that provided milk through a nipple—a “cupboard,” but little else. The other was a cloth-covered figure providing no milk but offering abundant stimulation from its soft terry-cloth cover. The results? Despite the nourishment provided by the wire model, the baby monkeys spent little time with it, preferring instead to remain nestled to the cloth mother. Moreover, when the baby monkeys were frightened, they sought comfort by clinging to the cloth figure. They also used it as a base of operations when exploring new situations. With these observations, then, the Harlows were able to show that the infant monkeys become attached to and prefer a “mother” figure that provides **contact comfort**, the stimulation and reassurance derived from physical touch.

Human infants need contact comfort, too. Since the Harlow's groundbreaking study, we have learned that physical contact promotes the release of pleasure-inducing endorphins. Physical development is affected by touch as well. University of Miami developmental psychologist Tiffany Field first experimented with massage on premature babies in 1986 and found that daily massage resulted in faster weight gain. Since Field's landmark study, further research has revealed a wide array of benefits associated with touch, including faster intellectual development, improved digestive tract functioning, improved circulation, and decreased production of stress hormones. Clearly, a close, interactive relationship with loving adults is a child's first step toward healthy physical growth and normal socialization (Blum, 2002; Sapolsky, 2002).

Attachment Psychologists refer to the establishment of a close emotional relationship between a child and a parent figure as **attachment**, although the popular media often refer to it as “bonding.” By either name, this relationship is especially important because it lays the foundation for other close relationships that follow.

Attachment appears to occur instinctively in many species, although it is not necessarily limited to the infant's interactions with the biological parents. One

Contact comfort Stimulation and reassurance derived from the physical touch of a caregiver.

Attachment The enduring socio-emotional relationship between a child and a parent or other regular caregiver.

striking example occurs in **imprinting**, the powerful attraction of infants of some species (notably in birds) to the first moving object or individual they see. A baby chick hatched by a mother duck will form an attachment to its surrogate mother—even though it is a chicken, not a duck. The imprinted chick will even follow its duck-mother right up to the water’s edge when she and her ducklings go for a swim. (This scientific concept was illustrated in Hans Christian Andersen’s story “The Ugly Duckling.”) Thus, the imprinting tendency is an innate predisposition, although the organism’s environment and experience determine what form it will take.



Konrad Lorenz (1903–1989), a researcher who pioneered the study of imprinting, dramatically demonstrated what can happen when young birds become imprinted on an object other than their mother.

In humans, research on contact comfort provides evidence of some physical need for attachment. Building on the Harlows’ work with monkeys, psychologist John Bowlby (1969, 1973) suggested that human attachment is innate, begins as early as the first few weeks, and functions as a survival strategy for infants. From an evolutionary perspective, it would stand to reason that infants who stayed close to their caregivers would be less vulnerable to threats from the environment. One study found, for example, that when mothers left the room, their 2- to 4-month-old babies’ skin temperature dropped, a sign of emotional distress (Mizukami et al., 1990). In these youngsters, skin temperature dropped even more when a stranger replaced the mother. In contrast, skin temperature remained steady if the mother stayed in the room—even if the stranger was present. Apparently, children only a few months old rely on their caretakers as a “safe base,” even before they can indicate attachment by walking or crawling (Bee, 1994).

Attachment Styles Have you ever noticed, though, that children seem to differ in their types of attachment? Some children seem comfortable with strangers when their primary caregiver is present, while others appear clingy and fearful. Still others seem to care very little who is present. Developmental psychologist Mary Ainsworth not only noticed those patterns but spent a career studying these various forms attachment takes in humans. To do so, she developed an innovative laboratory procedure called the “Strange Situation,” which continues to be used today as the standard for measuring attachment.

What is this clever procedure? The Strange Situation involves putting young children and their primary caregiver into a series of interactions—sometimes together, sometimes separated, and sometimes with a stranger. Researchers then observe how the child responds to these various situations (Ainsworth, 1989; Lamb, 1999). Using such methods in a variety of cultures, Ainsworth found that the children’s responses fell into two main categories, reflecting either **secure attachment** or insecure attachment. *Securely attached* children were relaxed and comfortable with their caregivers and tolerant of or even interested in strangers and new experiences. When separated from their caregivers, they became upset—which, from 6 to 30 months, is a normal behavior called **separation anxiety**—but calmed down immediately on the caregiver’s return and resumed their normal activities. They seemed to perceive their caregivers as a “secure base” from which to explore the world, confident that the caregiver would be available to help if needed.

Insecurely attached children could be divided into two categories: *anxious-ambivalent* and *avoidant*. The **anxious-ambivalent** children wanted contact with their caregivers but cried with fear and anger when separated from their caregivers and proved difficult to console even when reunited. They clung anxiously to their caregivers when a stranger approached and were uncomfortable exploring new situations. Conversely, the **avoidant** children weren’t interested in contact, displaying no distress when separated from their caregivers and no particular happiness when

Imprinting A primitive form of learning in which some young animals follow and form an attachment to the first moving object they see and hear.

Secure attachment The attachment style of children who are relaxed and comfortable with their caregivers and tolerant of strangers and new experiences—as contrasted with children who are *insecurely attached*.

Separation anxiety A common pattern of distress seen in young children when separated from their caregivers.

Anxious-ambivalent attachment One of two primary response patterns seen in insecurely attached children—in which a child wants contact with the caregiver, shows excessive distress when separated from the caregiver, and proves difficult to console even when reunited.

Avoidant attachment One of two primary response patterns seen in insecurely attached children—in which a child shows no interest in contact with the caregiver and displays neither distress when separated from the caregiver nor happiness when reunited.

reunited. Overall, some 60% of American children develop secure attachment, while about 25% are anxious-ambivalent, and 15% are avoidant.

Attachment has become a very hot topic over the past decade, as research is indicating that patterns established in infancy may influence a variety of childhood and adult behaviors, including aggression, friendships, job satisfaction, relationship choices, and intimacy experiences (Berk, 2004; Gomez & McLaren, 2007). But what causes a child to develop a particular attachment style? For many years, nurture was presumed to be the culprit: Specifically, it was thought that good parents produced securely attached children, while inconsistent parenting produced anxious-ambivalent children, and neglectful parenting led to avoidant attachment.

Today, though, most researchers recognize that nature and nurture interact in the development of attachment style. Infant temperament, for example, which is largely genetic, influences how easy or difficult it is to be responsive to an infant. It is not surprising, then, that one study found that babies who were fussier in the first few days of life were more likely to have an anxious-ambivalent attachment style one year later (Miyake, 1993). This seems quite logical, as most parents would have more difficulty consistently “reading” the signals from a temperamental baby than with an easy baby, thus creating an interaction effect between infant temperament and parenting style.

Culture and Attachment Before making up your mind about which attachment style is “best,” though, consider the important factor of culture. Did you assume, like many Americans do, that secure attachment is the ideal? On the contrary, German families prefer avoidant attachment, as it promotes greater self-sufficiency, while Japanese parents rarely leave their children unattended, fostering greater dependence and an accompanying anxious-ambivalent attachment style (Grossman et al., 1985; Miyake et al., 1985). Like many qualities, then, the judgment of which is “ideal” depends heavily on the prevailing values of the culture.

Long-Term Effects of Attachment Attachment isn’t just for kids. As children grow up and become adults, they no longer restrict their attachment to their primary caregiver: They gradually widen their attachments to include other family members, friends, teachers, coworkers, and others in their community. Some evidence suggests that the primary attachment relationship, though, continues to serve as a working model for later important relationships. In other words, whatever the child learns to expect in that first caregiver relationship becomes the lens through which later relationships are perceived and interpreted. We should emphasize, however, that—powerful as attachment is—individuals who lack healthy attachments in infancy and childhood are not necessarily doomed to failure in life. While attachment problems are good predictors of later problems with social relationships, many people do succeed in overcoming attachment difficulties (Kagan, 1996, 1998). Healthy relationships, later in childhood or even in adulthood, can “reset” the working model. With such caveats in mind, we now invite you to take the quiz in the “Do It Yourself!” box, “What’s Your Attachment Style?”

Psychosocial Development: Trust versus Mistrust The large body of research on attachment dovetails nicely with the first stage in one of the major lifespan theories of development. Erik Erikson (1902–1994) was a prominent psychoanalyst who believed that, on an unconscious level, we form basic beliefs about ourselves and our relationship to our social world as we go through life. These basic beliefs, then, influence our development through the choices we make in our relationships. Furthermore, Erikson thought each of these basic beliefs developed out of a crisis (which could be resolved successfully or remain unresolved) at a critical period in our development. Thus, he characterized each of the eight stages in his developmental theory as a choice between two opposing beliefs, such as *trust versus mistrust*, the first developmental problem of our lives. (See Table 6.1.)

CONNECTION • CHAPTER 1

Erik Erikson was a prominent neo-Freudian theorist.

DO IT YOURSELF!**What's Your Attachment Style?**

Identify which one of the following three self-descriptions you most agree with (adapted from Shaver & Hazan, 1994):

1. I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and love partners often want me to be more intimate than I feel comfortable being.
2. I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner, and this sometimes scares people away.
3. I find it relatively easy to get close to others and am comfortable depending on them. I don't often worry about being abandoned or about someone getting too close to me.

What Your Choice Means We realize that it is probably obvious to you which of the statements above is "best." Nevertheless, just considering the alternatives should help you understand attachment styles—and, perhaps, yourself—a little better. Here's

our interpretation: If you selected the first statement, you agreed with the attitude that reflects an avoidant, insecure attachment. This style was chosen by 25% of Shaver and Hazan's respondent sample. The second statement reflects an anxious-ambivalent, insecure attachment style, selected by 20% of the sample. The third statement reflects a secure attachment style, the most common pattern identified, accounting for 55% of respondents (Shaver & Hazan, 1994).

What do these styles signify for later life? Through interviews, observations, and questionnaires, researchers have identified several consequences of attachment style, secure or insecure, in adulthood (see Ainsworth, 1989; Collins & Read, 1990; Hazan & Shaver, 1990; Kirkpatrick & Shaver, 1992; Shaver & Hazan, 1993, 1994; Simpson, 1990):

- Secure individuals have more positive self-concepts and believe that most other people are good natured and well intentioned. They see their personal relationships as trustworthy and satisfying.
- Secure respondents are satisfied with their job security, coworkers, income, and work activity. They put a higher value on relation-

ships than on work and derive their greatest pleasure from connections to others.

- Insecure, anxious-ambivalent persons report emotional extremes and jealousy. They feel unappreciated, insecure, and unlikely to win professional advancement. They make less money than those with other attachment styles, working more for approval and recognition than financial gain. They fantasize about succeeding but often slack off after receiving praise.
- Avoidant people fear intimacy and expect their relationships to fail. They place a higher value on work than on relationships and generally like their work and job security. They follow a workaholic pattern, but (not surprisingly) they are dissatisfied with their coworkers.
- Secure individuals tend to choose as partners others who are secure. After breakups, avoidant individuals claim to be less bothered by the loss of the relationship, although this may be a defensive claim, with distress showing up in other ways (e.g., physical symptoms).

TABLE 6.1 Erikson's Psychosocial Stages

Age/Period (approximate)	Principal challenge	Adequate resolution	Inadequate resolution
0 to 1½ years	Trust vs. mistrust	Basic sense of safety, security; ability to rely on forces outside oneself	Insecurity, anxiety
1½ to 3 years	Autonomy vs. shame or self-doubt	Perception of self as agent; capable of controlling one's own body and making things happen	Feelings of inadequacy about self-control, control of events
3 to 6 years	Initiative vs. guilt	Confidence in oneself as being able to initiate, create	Feelings of guilt over one's limitations or inabilities
6 years to puberty	Industry vs. inferiority	Perceived competence in basic social and intellectual skills; self-acceptance	Lack of self-confidence; feelings of failure
Adolescence	Identity vs. role confusion	Comfortable sense of self as a person, both unique and socially accepted	Sense of self as fragmented, shifting, unclear sense of self
Early adulthood	Intimacy vs. isolation	Capacity for closeness and commitment to another	Feeling of aloneness, loneliness, separation; denial of intimacy needs
Middle adulthood	Generativity vs. stagnation	Focus of concern beyond oneself, to family, society, future generations	Self-indulgent concerns; lack of future orientation
Late adulthood	Ego-integrity vs. despair	Sense of wholeness; basic satisfaction with life	Feelings of futility, disappointment

Erikson theorized that, in the first 18 months of life, the major developmental task facing the infant is to develop a sense of **trust** in the world. As we have seen, infants who develop a secure attachment style see the world as an interesting place, full of new experiences to explore. With the knowledge of a primary caregiver as a “safe base” from which to explore, these infants become prepared to develop into children (and later into adults) who are comfortable in new situations and possess an adventurous and resilient spirit to help them through life. Children who do not develop this will experience difficulties navigating through later developmental challenges, as the issue of trust remains unresolved and acts as a barrier between the individual and the social world. To put it more simply, infants who do not develop a basic sense of trust in their social world will have trouble forming and maintaining satisfactory relationships.

While Erikson’s theory has its critics, the criticism revolves primarily around whether his eight stages occur in their prescribed order for everyone or whether they can be experienced at different times for different people (based at least in part on cultural norms). Critics also note that Erikson’s work was based primarily on his own clinical observations, rather than rigorous scientific methods. Remarkably, though, many of his observations have since been supported by methodologically sound research. And his was the first theory of human development to encompass the entire lifespan: Previous theories were interested only in the first 12 to 17 years of life, with the misguided assumption that, once you got through adolescence, you were fully and permanently developed! For these reasons, Erikson’s theory remains prominent today in the study of human development. We will return to his theory and explore the other seven stages he proposed, in later sections of this chapter.

CONNECTION • CHAPTER 1

Clinical observation is a form of the case study method.

PSYCHOLOGYMATTERS

Psychological Traits in Your Genes

Eye color and the shape of your earlobes are purely genetic traits. Even some food aversions, such as a distaste for broccoli, can be anchored in the genes. But, as far as we know, heredity by itself determines none of our more complex psychological characteristics (Horgan, 1993). Where personality traits, temperament, interests, and abilities are concerned, heredity always acts in combination with environment. Outgoing people, for example, aren’t just born that way; they have also been encouraged to let their tendencies to extraversion show. Still, it’s fair for developmental psychologists and biopsychologists to ask which psychological characteristics have strong genetic links.

A genetic contribution to general intelligence, for example, is well established—although psychologists disagree over the magnitude of heredity’s role (Plomin et al., 1994). There is also a good possibility that genes contribute to your sexual orientation (Hamer et al., 1993). And it just may be that an interest in skydiving, rock climbing, or other risky behavior has a substantial genetic component (Hamer, 1997). The evidence suggests that genes also contribute to your basic temperament and personality, including all of the “Big Five” personality factors (Bouchard, 1994; Plomin, 1997).

Likewise, some clinical disorders are associated with genetic abnormalities (Eley, 1997; Plomin et al., 1994). One of the first to be discovered was Huntington’s disease, a rare problem that causes aggressive behavior and mental deterioration beginning in midlife (Cattaneo et al., 2002). Depression, a far more common problem, can also have genetic roots (although this doesn’t mean that everyone who gets depressed has a genetic problem, nor that medication is always the best way to treat it). Similarly, twin studies have revealed a strong genetic contribution to schizophrenia, a major mental disorder. Fear, too, can have a hereditary basis, especially in those who suffer from a condition known as panic disorder. So can anxiety, the basis for repetitive “neurotic” rituals, such

CONNECTION • CHAPTER 10

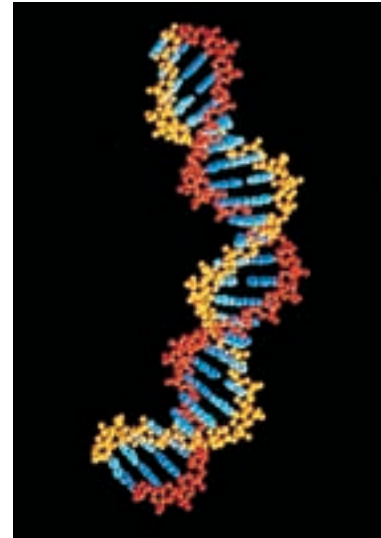
The Big Five are fundamental traits that reliably distinguish different personality patterns among people in all cultures.

Trust The major developmental goal during the first 18 months of life. According to Erikson’s theory, the child must choose between trusting or not trusting others.

as compulsively checking and rechecking the alarm-clock setting, seen in obsessive-compulsive disorder. There's also evidence that the violence that may occur in an antisocial personality and the uncontrollable outbursts of Tourette's syndrome stem ultimately from the genes. And, if you are older, you may worry that every instance of forgetting is a sign of Alzheimer's disease, which (in some forms) arises from a genetic flaw that takes first the memory and then the rest of the mind.

Thus, we see that many psychological traits, both desirable and undesirable, have a connection to our genes, as well as our experience. But, at the risk of playing the same tune too often, we must emphasize: Genetics is not everything. While heredity is involved in nearly all we do, human behaviors also are shaped by environment. And by "environment" we mean not only the influence of learning (including the impact of all our experiences) but also physical factors such as nutrition and physical stress (Brown, 1999). In almost all cases, it is the interaction of heredity and environment that drives a behavior, disorder, or trait.

Unfortunately, people sometimes go to extremes by seeing hereditary effects everywhere. A strong hereditarian stance can, for example, lead to unfair labeling of people as having "bad blood," if they come from troubled or abusive families. Just as disturbing, hereditarian expectations can create complacency and self-centeredness in those whose parents have desirable characteristics, such as high intelligence or good looks. Either way, expectations about genetic influences can create a self-fulfilling prophecy, which leads people to live up (or down) to their expectations. If you expect to be smart and successful (or dumb and a failure), chances are you won't be disappointed.



The genetic code, written in DNA, contains our complete hereditary blueprint, grouped into genes and chromosomes.

Check Your Understanding

1. **RECALL:** "Nature" refers to the effects of _____, and "nurture" refers to the effects of _____.
2. **APPLICATION:** You are a psychologist working in a pediatric hospital. What would you recommend as one of the most important things that the staff could do to promote healthy development in the newborns?
 - a. Talk to them.
 - b. Touch them.
 - c. Make eye contact.
 - d. Sing to them.
3. **ANALYSIS:** What factors influence the type of attachment style an infant develops?
4. **RECALL:** Teratogens can cause
 - a. fetal alcohol syndrome.
 - b. impaired cognitive development.
 - c. ADHD.
 - d. all of the above
5. **UNDERSTANDING THE CORE CONCEPT:** Describe three ways that the infant comes into the world prepared to survive and thrive.

Answers 1. genetics or heredity; the environment 2. b 3. infant temperament and the consistency and responsiveness of the caregivers 4. d 5. Infants have an array of behavioral reflexes, sensory abilities, and social abilities (such as mimicry) that promote adaptation to their environments.

6.2 KEY QUESTION

WHAT ARE THE DEVELOPMENTAL TASKS OF CHILDHOOD?

Three of the greatest accomplishments of your life include acquiring your native language, forming relationships with the important people in your life, and developing your ability to think and reason. Each of these serves as the basis for further development later in life. And we will see that, as children work through these tasks, they undergo profound psychological changes that are the result of both their genetic code and their environment. Here's how our Core Concept states the main idea of this section:

WHAT ARE THE DEVELOPMENTAL TASKS OF CHILDHOOD?

core concept

Nature and nurture work together to help children master important developmental tasks, especially in the areas of language acquisition, cognitive development, and development of social relationships.

As we will see below, the developmental differences between children and adults are huge, but the differences in language, thought, and socialization are not simply the result of adults' greater experience or store of information. The differences between children and adults also involve the unfolding of crucial maturational processes. Let us first observe these processes at work as we examine the development of language in children.

How Children Acquire Language

One of the defining characteristics of humans is the use of complex language—our ability to communicate through spoken and written words and gestures. From a developmental perspective, human language acquisition is awe inspiring: Newborn children know no words at all, yet in only a few years virtually all of them become fluent speakers of any language they hear spoken regularly—or see, in the case of gestural languages such as American Sign Language. What makes them such adept language learners? Developmental specialists believe that human infants possess innate abilities that help them with this task (Pinker, 1994, 2006).

Language Structures in the Brain According to one prominent theory, children acquire language not merely by imitating but by following an inborn program of steps to acquire the vocabulary and grammar of the language in their environment. Psycholinguist Noam Chomsky (1965, 1975) proposed that children are born with mental structures—built into the brain—that make it possible to comprehend and produce speech. Many experts agree with Chomsky that innate mental machinery orchestrates children's development of language (Hauser et al., 2002). Indeed, research based on the Human Genome Project has provided evidence that the foundations of language are, in part, genetic (Liegeois et al., 2001). One such mechanism, we have seen, lies in Broca's area, the motor speech “controller” in the cerebral cortex. Chomsky refers to these speech-enabling structures collectively as a **language acquisition device**, or **LAD**.

In Chomsky's theory, the LAD—like a computer chip—contains some very basic rules common to all human languages. One such rule might be the distinction between nouns (for names of things) and verbs (for actions). These innate rules, Chomsky argues, make it easier for children to discover patterns in languages to which they are exposed. Additional evidence for Chomsky's theory comes from the fact that children worldwide learn their native languages in very similar stages at very similar times. A logical hypothesis for explaining this pattern would be that children possess inborn “programs” for language development that automatically run at certain times in the child's life.

Despite the widespread agreement that humans possess some kind of innate ability to acquire language, we cannot ignore the role of the environment. Although infants are born with the ability to produce all the sounds in the approximately 4000 languages spoken on our planet, by about 6 months of age they seem to have zeroed in on the dominant language in their environment. The months spent hearing these sounds combine with their own experiments at verbalization to refine their efforts, and they lose the ability to produce the sounds that are not part of their own language. Children being raised in a Japanese-speaking culture, for example, lose the ability to distinguish between the sounds made by the letters *R* and *L*, as the letter *L* is not part of the Japanese language (Iverson et al., 2003).

Such cultural variations in the specifics of children's language development suggest that the built-in capacity for language is not a rigid device but a set of “listening rules” or guidelines for perceiving language (Bee, 1994; Slobin,

Language acquisition device (LAD)

A biologically organized mental structure in the brain that facilitates the learning of language because (according to Chomsky) it is innately programmed with some of the fundamental rules of grammar.

1985a,b). Babies pay attention to the sounds and rhythms of the sound strings they hear others speak (or in sign language, see), especially the beginnings, endings, and stressed syllables. Relying on their built-in “listening guides,” young children deduce the patterns and rules for producing their own speech. Such adaptability suggests that the LAD in children is flexible, not rigidly programmed (Goldin-Meadow & Mylander, 1990; Meier, 1991).

Acquiring Vocabulary and Grammar Clearly, then, inborn language abilities don’t tell the whole story, for children must learn the words and the structure of a particular language. Accordingly, learning the basic grammar and vocabulary in the native language represents an important project for children in their first few years of life—and they are excellent language learners. By 4 months of age, babies are **babbling**: making repetitive syllables such as “mamamama.” Interestingly, deaf babies being raised in a sign-language environment start babbling at just the same time—but with their hands, mimicking repetitive syllables from ASL (Pettito & Marentette, 1991). By about the time of their first birthday, babies enter the one-word stage, where they are speaking full words, and by 18 months word learning is accelerating rapidly. At this time, you might notice what psychologists call the “naming explosion,” when children seem to delight in their efforts to point to objects and name them. By age 2, children are entering the two-word stage, and the range of meanings they can convey increases tremendously. By this time, the average child has a vocabulary of nearly a thousand different words (Huttenlocher et al., 1991). By age 6, that number has burgeoned to an astounding 10,000 words (Anglin, 1993, 1995). And the pace of vocabulary acquisition picks up even more between about ages 6 and 10, as you can see in Figure 6.2.

Practice Makes Perfect Even though the rapid development of language seems driven largely by a genetic timetable, the role of culture and the environment have an impact on the degree and the pace at which children learn language. Like many learning tasks, the frequency of practice makes a difference. Mothers tend to talk significantly more with their young daughters than with their young sons (Leaper et al., 1998). Even more pronounced is the difference between children raised in low- versus middle-SES households (the term *SES* refers to socioeconomic status, which is a composite indicator of income and education level). Parents in low-SES households read to their children an average of just 25 hours between the ages of 1 and 5—compared to a whopping 1000 hours in the middle-SES group (Neuman, 2003). These differences in early learning are evident in findings that girls and middle-SES children begin kindergarten with more advanced verbal skills than boys and children from low-income SES families (Ready et al., 2005).

Grammar Turns Vocabulary into Language Even if you have a limited vocabulary, you can combine the same words in different sequences to convey a rich variety of meanings. For example, “I saw him chasing a dog” and “I saw a dog chasing him” both use exactly the same words, but switching the order of the words *him* and *dog* yields completely different meanings. **Grammar** makes this possible: It is a language’s set of rules about combining and ordering words to make understandable sentences (Naigles, 1990; Naigles & Kako, 1993). Different languages may use considerably different rules about grammatical combinations. In Japanese, for example, the verb always comes last, while English is much more lax about verb position.

First Sentences In their early two- and three-word sentences, children produce **telegraphic speech**: short, simple sequences of nouns and verbs without plurals, tenses, or function words like *the* and *of*. For example, “Ball hit Evie cry” is telegraphic speech. To develop the ability to make full sentences, children must learn to use other forms of speech, such as modifiers (adjectives and adverbs) and articles (the, those), and they must learn how to put words together—grammatically.

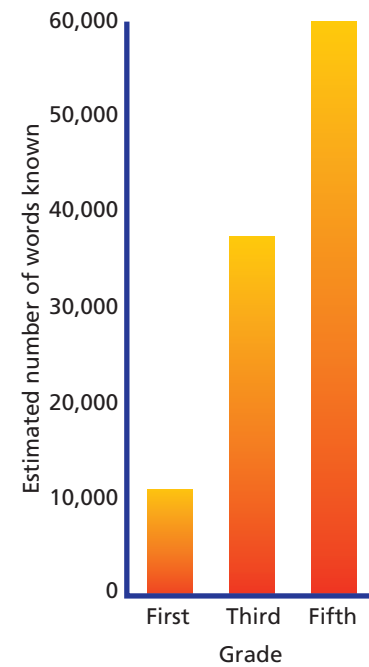


FIGURE 6.2
Growth in Grade-School Children’s Vocabulary

The number of words in a child’s vocabulary increases rapidly during the grade school years—an even faster rate of increase than during the preschool years. The chart shows total vocabulary, including words that a child can use (production vocabulary) and words that a child can understand (comprehension vocabulary). These data were reported in 1995 by J. M. Anglin of the University of Waterloo, Ontario, Canada.

Babbling The production of repetitive syllables, characteristic of the early stages of language acquisition.

Grammar The rules of a language, specifying how to use the elements of language and word order to produce understandable sentences.

Telegraphic speech Short, simple sequences of nouns and verbs without plurals, tenses, or function words like *the* and *of*—somewhat like the language once used in telegrams.

In English, this means recognizing and producing the familiar subject-verb-object order, as in “The lamb followed Mary.”

Finally, as children’s language ability develops, they become skilled in using **morphemes**, the meaningful units that make up words. Morphemes mark verbs to show tense (walked, walking) and mark nouns to show possession (Maria’s, the people’s) and plurality (foxes, children). Often, however, children make mistakes because they do not know the rule or apply an inappropriate one (Marcus, 1996). One common error, known as *overregularization*, applies a rule too widely and creates incorrect forms. For example, after learning to make past tense verb forms by adding *-d* or *-ed*, children may apply this “rule” even to its exceptions, the irregular verbs, creating such nonwords as *hitted* and *breaked*. Learning to add *-s* or *-es* to make plurals, children may apply the rule to irregular nouns, as in *foots* or *mouses*.

Other Language Skills Words and the grammatical rules for combining them are only some of the ingredients of communication. To communicate well, children also need to learn the *social rules of conversation*. They must learn how to join a discussion, how to take turns talking and listening, and how to make contributions that are relevant. Adult speakers use body language, intonation, and facial expressions to enhance their communication. They also use feedback they get from listeners and are able to take the perspective of the listener. Children must master these skills to become successful communicators—to become part of a human language community.

As they grow older, children also begin to express abstract meanings, especially as their thoughts extend beyond the physical world and into their psychological world. For example, after the age of 2, children begin to use words such as *dream*, *forget*, *pretend*, *believe*, *guess*, and *hope*, as they talk about internal states (Shatz et al., 1983). They also use words such as *happy*, *sad*, and *angry* to refer to emotional states. Later, after further cognitive advances that we will explore in the next section, they understand and use highly abstract words such as *truth*, *justice*, and *idea*.

What is the major point that stands out amidst the complexities of language acquisition? It is part of our Core Concept: *Language is a major developmental task of childhood—for which children are exquisitely prepared*. And the way they acquire and use language suggests that these early steps on the path to adulthood involve a combination of learning and innate processes that unfold on their own developmental timetables.

Cognitive Development: Piaget’s Theory

If you have ever known a toddler going through the naming explosion, you have seen that children have an insatiable appetite for labeling things they know. Behind this labeling is their emerging ability for thinking, perceiving, and remembering. The next few pages will focus on the ways that these mental abilities emerge: a process called **cognitive development**, which is the second of the three main developmental tasks of childhood identified in our Core Concept.

Psychologists interested in cognitive development ask such questions as: *When do children realize that objects still exist even when they can’t see them? Do they know that it is possible to hold ideas that aren’t true? Can they understand that people have desires and dreams, but objects do not?* Developmental psychologists investigate not only what children think but how they think, as illustrated in the pioneering work of Swiss psychologist Jean Piaget. For nearly 50 years, Piaget observed children’s intellectual development and formulated his observations into a comprehensive theory.

Piaget began this quest to understand the child’s mind by carefully observing the behavior of his own three children. His methods were simple: He would pose problems to them, observe their responses, slightly alter the situations, and once

Morpheme A meaningful unit of language that makes up words. Some whole words are morphemes (example: *word*); other morphemes include grammatical components that alter a word’s meaning (examples: *-ed*, *-ing*, and *un-*).

Cognitive development The global term for the development of thought processes from childhood through adulthood.

again observe their responses. Piaget paid special attention to the developmental transitions and changes in his children's thinking, reasoning, and problem solving. This focus led to a **stage theory** of development, which emphasized Piaget's view that people undergo distinctive revolutions in their thought processes, producing four discrete *stages* that emerge as they move through childhood and adolescence. We will see below that three key ideas distinguish Piaget's approach: (1) *schemas*, (2) the interaction of *assimilation* and *accommodation*, and (3) the *stages of cognitive development*.

Schemas To illustrate the concept of schemas, think of some four-legged animals. Now think of some that are friendly. Then think of one that barks. You might have started by imagining elephants, tigers, cats, and dogs (all four-legged), then narrowed your choices down to cats and dogs (four-legged and friendly), and finally to just dogs (which bark). You could do this easily only because you have developed mental structures that enable you to interpret concepts and events. Piaget termed such mental structures **schemas**. We have schemas for concepts, such as “dog” and “development.” We have schemas for actions, such as “eating with chopsticks.” We also have schemas for solving problems, such as “finding the area of a circle” or “dealing with a crying baby.” In general, schemas are mental frameworks that guide thinking. According to Piaget, they are also the building blocks of development. Schemas form and change as we develop and organize our knowledge to deal with new experiences and predict future events. As you read this, you are building a schema about schemas!

Assimilation and Accommodation In Piaget's system, two dynamic processes underlie all cognitive growth: assimilation and accommodation. **Assimilation** is a mental process that incorporates new information into existing schemas. So a baby who knows how to grasp a rattle will apply the same strategy to a sparkly piece of jewelry worn by his caregiver. Likewise, an older child whose family has a pet canary might use assimilation during a trip to the zoo when she learns that a large parrot or a flamingo is also a bird. You, too, experience assimilation when you read about a favorite actor's new film or gain skill in using a new program on your computer. Essentially, when we assimilate, we are broadening an existing schema by integrating new information into it.

By contrast, we use **accommodation** when new information does not fit neatly into an existing schema. Accommodation is the process of restructuring or modifying schemas to accommodate the new information. Thus, a child who has learned to grasp rattles and jewelry may have trouble trying to grasp a large ball the same way. Similarly, if the child on her first trip to the zoo later encounters a bat, she will have to create a new schema for “bat,” since it is a creature with wings but is not a bird. Adults experience accommodation of their mental schemas, too. For example, the Internet has caused widespread accommodation in the schemas people use to conceptualize shopping and communicating. You, too, may need to modify a schema when the professor in your psychology course says something that surprises you—such as, “Children have innate language abilities,” when you had always assumed that language was acquired entirely by learning. As a result, your schema about newborn children may change to accommodate your new knowledge.

For Piaget, cognitive development results from the continual interweaving of assimilation and accommodation. Through these two processes, the individual's behavior and knowledge become less dependent on concrete external reality and increasingly reliant on internal thought. In general, assimilation makes new information fit our existing views of the world, and accommodation changes our views to fit new information.

Piaget's Stages of Cognitive Development According to Piaget, the way a child thinks about the world progresses through four revolutionary changes. He

CONNECTION • CHAPTER 5

Schemas are knowledge clusters or general conceptual frameworks that provide expectations about topics, events, objects, people, and situations in one's life.



An infant finds that the sucking reflex works just as well with a bottle as with a breast, and thus assimilates when she adds sucking a bottle to her existing schema for sucking.

Stage theory An explanation of development that emphasizes distinctive or rather abrupt changes. A stage theory of cognitive development, then, emphasizes revolutionary changes in thought processes.

Schema In Piaget's theory, a mental structure or program that guides a developing child's thought.

Assimilation A mental process that incorporates new information into existing schemas.

Accommodation A mental process that modifies schemas in order to include (or accommodate) new information.



A child who knows that small creatures with wings are birds uses accommodation when he learns that this winged creature is not a bird, but a butterfly.

Sensorimotor stage The first stage in Piaget's theory, during which the child relies heavily on innate motor responses to stimuli.

Sensorimotor intelligence Piaget's term for the infant's approach to the world, relying on relatively simple physical (motor) responses to sensory experience, with very little cognition ("intelligence") involved.

Object permanence The knowledge that objects exist independently of one's own actions or awareness.

Goal-directed behavior An ability that emerges during the sensorimotor period by which infants develop the ability to keep a simple goal in mind as they pursue it.

Mental representation The ability to form internal images of objects and events.

Preoperational stage The second stage in Piaget's theory, marked by well-developed mental representation and the use of language.

CONNECTION • CHAPTER 3

Observational learning is the process documented in Bandura's famous "Bobo doll" experiment.

described these changes as stages of cognitive growth: the *sensorimotor stage* (infancy), the *preoperational stage* (early childhood), the *concrete operational stage* (middle childhood), and the *formal operational stage* (adolescence). At each stage, distinct thinking styles emerge as the child progresses from sensory reaction to logical thought. It is important to note that the maturation process dictates that all children progress through the four stages in the same sequence. Due to the interaction of heredity and environment, though, some children take longer to pass through a given stage than others.

The Sensorimotor Stage (Birth to about Age 2) We have seen that children enter the world equipped with many innate sensory abilities and reflexive behaviors, such as recognizing familiar sounds and the grasping and sucking reflexes. None of these require thought—in the sense of the complex mental activity seen later in childhood. Instead, according to Piaget, children in the **sensorimotor stage** explore the world through their senses and motor actions, with very little "thinking" involved. Piaget called this **sensorimotor intelligence**.

During this rapidly evolving stage of development, babies work toward the major achievement of this stage: **object permanence**, which begins at about 8 months. Prior to that time, you might have noticed that babies will not look for a toy or other object that disappears. Piaget interpreted this behavior to mean that they did not understand that the object still existed when they could no longer see it. In other words, it was "out of sight, out of mind." Beginning at around 8 months, though, if you show an infant a toy and then let her see you hide it under, say, a blanket, she will look for it under the blanket. What's more, she will reliably do this even with a delay of a minute or more between the hiding and the seeking. This demonstrates the beginning of the understanding of object permanence. Over the next several months, infants develop the ability to seek something after increasingly longer delays, and they also become more successful at finding objects hidden in different locations than they were the first time (Moore & Meltzoff, 2004).

Concurrently with these accomplishments, infants are learning **goal-directed behavior**, as evidenced by their experiments with various objects. For example, a child who drops a spoon might be very interested in the clatter it makes as it bounces off a tile floor and want to repeat the action over and over again. What may seem annoying to an onlooker with sensitive hearing is really just the infant delighting in exercising some control over her world!

The emergence of object permanence, combined with an infant's increasing experiments with goal-directed behavior, provide substantial evidence that infants are beginning to form **mental representations** of objects and to recognize their own relation to the world. This mental imagery empowers a child's thinking and problem solving. Imitative behaviors that, early in infancy, were confined to the immediate present situation will show up after increasing delays in time, in what is the beginning of *observational learning*. By six months, infants will imitate behaviors they saw the previous day, and during the second year, they can retain and imitate images of previously seen behaviors for as long as a month (Klein & Meltzoff, 1999). These achievements of the sensorimotor stage propel the toddler into the next stage: the preoperational stage.

The Preoperational Stage (from about 2 to 7 Years of Age) The cognitive advances in the next developmental stage, the **preoperational stage**, grow out of the ability to represent objects mentally. After noting rapid development during the sensorimotor stage, Piaget seems to have seen the preoperational stage as a sort of transition stage between the sensorimotor stage and the third stage (the concrete operational stage). In his observations, this was a period in which symbolic abilities that emerged in the sensorimotor stage were expanded on and consolidated. As such, he described the primary features of this stage as limitations in a child's thinking, rather than advances. Let's consider some of those features.

- **Egocentrism** causes children to see the world only in terms of themselves and their own position. Further, they assume that others see the world in the same way that they do. (We hasten to add that Piaget did not intend egocentrism to be interpreted as selfishness but rather as a limited perspective on the world.) Piaget discovered this through an experiment he called the “three mountains task.” (See Figure 6.3.)

So, when you are talking to a preoperational child on the phone, she may say, “Look at my new dollie!” assuming you can see things on her end of the line. As a result of this egocentrism, Piaget thought that preoperational children were not yet able to fully empathize with others or take others’ points of view. This is one aspect of Piaget’s theory that has been challenged, a point that we will elaborate on shortly.

- **Animistic thinking** involves the belief that inanimate objects have life and mental processes, just as people do. This is when children display some very charming behaviors, such as having a tea party with their teddy bears, or putting a Band-Aid on a doll that has fallen and hit the ground, or worrying that trimming a tree might hurt it.
- **Centration** is seen when a child focuses attention too narrowly, while ignoring other important information. That is, the child can “center” on only one bit of information at a time. As a result, the child will not understand the “big picture” of an event or problem. So, for example, a thirsty child may insist on drinking a “big glass” of juice, preferring a tall narrow container to a short wide one, mistakenly assuming that the height of the glass ensures that it will hold more juice, while ignoring the other relevant dimension of width (Figure 6.4). (See the nearby “Do It Yourself!” box.)
- **Irreversibility** is the inability to think through a series of events or steps involved in solving a problem and then to reverse course, returning to the mental starting point. In short, preoperational children lack the mental trial-and-error ability of older children to do and then undo an act in their minds. For example, Sam might see Maria spill a box of raisins on the table and—because the raisins are spread out over a large area—think, “Wow! Maria has lots more raisins than I have in my little box.” But preoperational Sam cannot mentally reverse the process and think, “If she put them all back in the box, it would look like the same amount I have in mine.” This inability—to do a mental “experiment,” then undo it and mentally try another approach—represents the biggest obstacle to logical thinking in the preoperational child.

While we might see these as limitations, it is important to recognize what developments are taking place during this time. Children are experimenting with their newly acquired ability to use mental representations, and in the process they are



FIGURE 6.3
Piaget's Three-Mountain Task

In Piaget's Three Mountain task, a child is shown a figure of three mountains. One mountain has a red cross at the top, one has a small house, and the third is snow-capped. On the other side of the figure (across the table from the child) sits a doll. When asked which mountain view the doll has, the preoperational child typically thinks the doll's view is the same as the child's own view. Piaget used this task to illustrate egocentrism, or the inability to understand that others' perspectives may differ from our own.

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FIGURE 6.4
Conservation of Liquid Task

Preoperational thinkers cannot understand that the amount of liquid remains the same when poured into a different-sized container. Mastery of this conservation task marks the transition to the concrete operational stage

Egocentrism In Piaget's theory, the self-centered inability to realize that there are other viewpoints beside one's own.

Animistic thinking A preoperational mode of thought in which inanimate objects are imagined to have life and mental processes.

Centration A preoperational thought pattern involving the inability to take into account more than one factor at a time.

Irreversibility The inability, in the preoperational child, to think through a series of events or mental operations and then mentally reverse the steps.

DO IT YOURSELF!**Playing with Children—Piagetian Style**

If you have access to a child, you can try out some of the problems Piaget posed for his children to study their thinking. For example, with a preoperational or concrete operational child, it's always fun to give a conservation problem that involves pouring liquid from a tall, narrow container into a short, wide one. Begin by pouring the same amounts into two identical vessels, such as glass measuring cups. Get the child to agree that you are

starting with the same amount in each. Then pour the liquid from one vessel into a shallow pan. Ask the child, "Does one of these have more than the other, or are they both the same?" Then see if your child's responses fit with Piaget's observations.

Piaget found that the concrete operational child—one who understands conservation—will know that the volume of liquid remains the same, regardless of the shape of the con-

tainer. The preoperational child will think that the shallow pan has less because the liquid does not come up as far on the container. This shows that the younger child does not know that volume is conserved, regardless of the shape of the container. Piaget claimed that it also showed that the younger child cannot reason about both height and width simultaneously.

(Note: Be sure to get parental permission before attempting this experiment.)

often highly creative. We see this creativity in the animism they display and also in their other make-believe games that are a central feature of the preoperational stage. In fact, it can be argued that, when creativity in problem solving declines in the next stage, the decline is not just a gain but in some ways also a loss.

The Concrete Operational Stage (from about 7 to about 11 Years of Age) At the next stage, children break through the barrier of irreversibility to understand, for the first time, that many things may stay essentially the same even when their superficial appearance changes. In this **concrete operational stage**, they can understand that a short, wide glass can hold as much juice as a tall, narrow one or that the spilled raisins must fit back in the box. In mastering **conservation**, the problems that defeated the preoperational child now yield to a new understanding of the way that volume is conserved. Similarly, they now understand that a string of red beads is not longer than an identical string of blue beads, even though the red beads are stretched out in a line while the blue beads lie in a small pile. They realize that the beads look different in their grouping, but this does not mean that they are different in number.

Along with the new ability to understand conservation, children at this stage have a wondrous new ability. They now can solve problems by manipulating concepts entirely in their minds: That is, they can perform **mental operations**. This allows concrete operational children to think things through before taking action. As a result, they may be less impulsive. They are also less gullible, giving up many "magical" notions, such as the belief in Santa Claus, that they now believe to be impossible.

Using their ability for performing mental operations, concrete operational children begin to use simple reasoning to solve problems. The symbols they use in reasoning are, however, still mainly symbols for concrete objects and events, not abstractions. The limitations of their concrete thinking are shown in the familiar game of "20 questions," the goal of which is to determine the identity of an object by asking the fewest possible yes/no questions of the person who thinks up the object. A child in this stage usually makes a series of specific guesses about what the object is ("Is it a bird?" "Is it a cat?"), rather than asking higher-level questions that more efficiently narrow down the possibilities for the correct answer ("Does it fly?" "Does it have fur?").

We will save our discussion of Piaget's final stage of cognitive development—the formal operational stage—for our discussion of adolescence. For now, suffice it to say that this final stage involves the development of abstract thought. Table 6.2 summarizes Piaget's four stages.

Beyond Piaget: Contemporary Perspectives on Cognitive Development

Most psychologists accept the broad picture that Piaget painted of development (Beilin, 1992; Lourenço & Machado, 1996). However, researchers have shown that

Concrete operational stage The third of Piaget's stages, when a child understands conservation but still is incapable of abstract thought.

Conservation The understanding that the physical properties of an object or substance do not change when appearances change but nothing is added or taken away.

Mental operation Solving a problem by manipulating images in one's mind.

TABLE 6.2 Piaget's Stages of Cognitive Development

Stage (Ages)	Characteristics and major accomplishments
Sensorimotor (approximately 0–2 years)	Children explore the world through their senses and motor abilities. Object permanence and goal-directed behavior emerge, along with the beginning of symbolic thought.
Preoperational (approximately 2–7 years)	Children's thought is characterized by egocentrism, animistic thinking, centration, and irreversibility. Symbolic thought continues to develop.
Concrete operations (approximately 7–11 years)	Children have mastered conservation and develop the ability to perform mental operations with images of concrete, tangible objects.
Formal operations (approximately 12+ years)	Teens and adults in this stage develop ability for abstract reasoning and hypothetical thought.

children are, in some ways, more intellectually sophisticated at each stage than Piaget had found (Munakata et al., 1997).

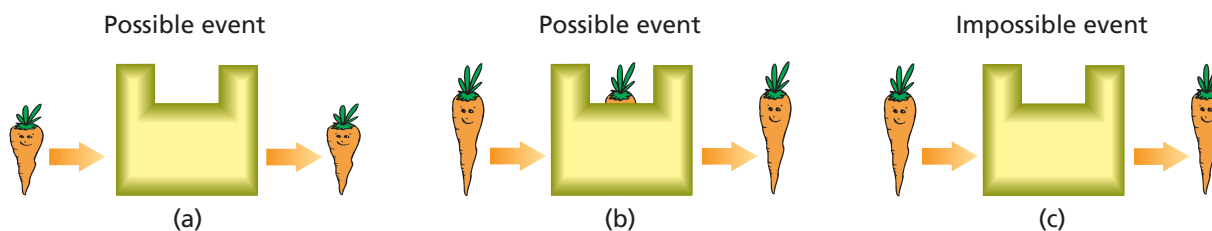
Hints of Abilities Appear Earlier Than Piaget Thought The limitations Piaget observed in the sensorimotor and preoperational stages have all been found to be mastered by children still in these age ranges. Object permanence is one example: The beginning of mental representation occurs as early as 4 months of age, rather than in the second year, as Piaget had thought. Children at that age shown “possible” and “impossible” events do not show surprise when viewing the possible event but do show surprise upon seeing the “impossible” event (Baillargeon & DeVos, 1991). (See Figure 6.5.)

Researchers have also found, in contrast with Piaget's notion of centration, that by age 3 or 4, children understand that the insides of objects (such as an egg, a rubber ball, or a dog), although invisible, are not necessarily identical to their external appearances (Gelman & Wellman, 1991). And in contrast with Piaget's claims about animistic thinking, 3- to 5-year-old children, when pressed to do so, are consistently able to distinguish between real and purely mental (imaginary) entities (Wellman & Estes, 1986). Finally, regarding egocentrism, by age 4, children can often see others' perspectives, as illustrated by the fact that they use simpler language and shorter words when talking with 2-year-olds than they do with older children or adults (Gelman & Shatz, 1978). Overall, Piaget's observations regarding the sequence of stages is accurate, but children today seem to develop some cognitive skills at a more accelerated pace than Piaget believed.

A Theory of Mind These cognitive advances signal the development of a **theory of mind**, which is an understanding that others may have beliefs, desires, and emotions

Theory of mind An awareness that other people's behavior may be influenced by beliefs, desires, and emotions that differ from one's own.

Test Events

**FIGURE 6.5**

Testing Infants for Object Permanence

In this innovative test of object permanence, infants are shown a series of “possible” and “impossible” events. In (a), a short carrot approaches a screen with a window at the top, then moves behind the screen, and finally emerges from the other side of the screen. In (b), a tall carrot does the same thing. The top of the short carrot is *not* visible through the window as it passes (because it is shorter than the window), but the top of the taller carrot *is* visible as it passes the window. Because both of these scenarios are logical, they represent the “possible” events. In (c), a tall carrot approaches and passes behind the screen, but this time the carrot top is *not* visible through the window (as it should be). Three- to four-month-old infants gaze longer at this “impossible” scenario than they do at the “possible” events, indicating what may be the beginnings of object permanence.

(Source: Adapted from L. E. Berk, *Child Development*, 6th ed. Copyright © 2002 by Pearson Education. Reprinted by permission of the publisher.)

different from one's own and that these mental states underlie their behavior (Frith & Frith, 1999). Your theory of mind underlies your expectations about how people will act in certain situations—such as when given a gift or when spoken to angrily. It also includes recognition that expectations about others' actions may have to be adjusted based on what we know about the individual in question. It facilitates empathy for others, enables deception, and increases our chance of making sound judgments about people when it counts.

Recent evidence indicates that these abilities may begin as early as 6 months of age—which dovetails with recent findings on object permanence discussed in the previous section. At that age, one study showed that infants could reliably distinguish between a helpful character and a harmful character and unfailingly chose the helpful character as a playmate (Hamlin et al., 2007). The cognitive milestones of the sensorimotor and preoperational stages facilitate further development of this initial accomplishment; and, by 5 years of age, children cross-culturally seem to understand that others' perceptions of the world may differ from their own (Callaghan et al., 2005).

Stages or Waves? A second criticism of Piaget's theory questions his notion of the stages as abrupt transitions. Newer research suggests that the transitions between one stage and another are more continuous than Piaget's theory implies. Psychologist Robert Siegler suggests that what is needed is a new metaphor for development (Siegler, 1994). Instead of the abrupt changes implied by stage theories, he proposes that we think of “waves.” The **wave metaphor**, he says, better fits both the scientific data and our everyday experience, which shows the variability of children's behavior. For example, during a single day, a child may use several different strategies to solve the same linguistic problem: “I ate,” “I eated,” and “I ated.” This is not the pattern we would find if a child were making a sudden leap from one stage to another. Instead, says Siegler, this is a pattern of overlapping developmental waves, where each wave can be thought of as the ebb and flow in the strength of a cognitive strategy (Azar, 1995).

Social and Emotional Development

Our health, happiness, and even our survival depend on forming meaningful, effective relationships, in the family, with peers—and, later in life, on the job. This means that children need to begin the long process of learning the rules their society uses for social and political interactions. They must also learn to monitor their own feelings and behavior and to understand those of others. This process of social and emotional development is one of the most important developmental tasks of childhood.

Smiling is one simple but important way people begin social and emotional interactions. So essential is a smile to human communication that a baby's first smile is probably generated automatically by genetically controlled processes. In fact, smiles occur in babies throughout the world (Gazzaniga, 1998a). The delight parents take in a baby's first smile represents the beginning of lifelong lessons in social behavior. People smile not only as a sign of positive feelings but also because their audience expects such a facial expression (Fridlund, 1990). However, social and emotional development involves much more than a winning smile. On the “nature” side, psychologists have found that our innate disposition or temperament influences our responsiveness to others. And, on the “nurture” side, psychologists have found many environmental factors that influence socialization. Furthermore, children's cognitive advancements are an essential component in their development of effective social relationships. In this section, we will examine how nature and nurture work hand-in-hand in the social and emotional development of children.

Temperament One powerful influence on the way children interact with the world is their **temperament**. Psychologists use the term *temperament* for an individ-

Wave metaphor A way of conceptualizing cognitive development, as occurring more gradually—in “waves”—rather than abruptly, as the stage theory suggests.

Temperament An individual's characteristic manner of behavior or reaction—assumed to have a strong genetic basis.

ual's inherited, "wired-in" pattern of personality and behavior. Harvard researcher Jerome Kagan, who has studied temperament in thousands of children, observed that about 20% of children are born with tendencies toward shyness, while about 40% are born predisposed to boldness (Kagan, 1998). Shy babies, in the face of unfamiliar situations, become upset or subdued and are likely to try to avoid the situation. Bold babies, on the other hand, are more sociable and likely to react with interest to new situations. Brain-imaging studies indicate that these differences are physiological: Shy babies have much more active amygdalas than do bold babies (Schwartz et al., 2003).

While basic temperaments can be recognized almost at birth, they are not written in stone (Kagan, 1996). From very early on, the environment interacts with these genetic tendencies, so that parenting styles and other aspects of a child's experience can modify the way temperament expresses itself. Oftentimes, people are less likely to engage and be playful with a shy baby, which will accentuate the child's initial disposition. On the other hand, if a shy baby's parents recognize the child's withdrawal and gently play with her and encourage her to interact, the child will become more outgoing than her temperament would otherwise have predicted. And a bold child reared by bold parents will certainly experience and respond to the world differently than will a bold child reared by timid or fearful parents.

Thus, family members and friends can teach every individual a variety of responses to the world, all within his or her temperamental range. We must also note that no temperament is ideal for all situations. We should "remember that in a complex society like ours, each temperamental type can find its adaptive niche" (Kagan, quoted in Gallagher, 1994, p. 47).

Socialization Through interaction with your parents, peers, and others, you learned how to get along with people, a developmental task called **socialization**. Socialization, however, doesn't just happen in childhood. It is the lifelong process of shaping an individual's behavior patterns, values, standards, skills, attitudes, and motives to conform to those regarded as desirable in a particular society (Hetherington & Parke, 1975). Socialization of gender roles is one example. Institutions exert pressure on the child to adopt socially approved values. Among these, the school and leisure-time choices, such as television and peers, have heavy influences. Increasingly, many preschool children are also shaped by their experiences in day care. And one other influence is of supreme importance: parenting styles.

Four Parenting Styles and Their Effects Most approaches to child rearing fall into one of four distinct parenting styles that developmental psychologists have found in families all over the world (Baumrind, 1967, 1971; Russell et al., 2002). (As you read about these, you might try to imagine how you would have turned out differently if your parents had used one of the other approaches.) **Authoritarian parents** often live by the slogan, "Spare the rod and spoil the child." They demand conformity and obedience, and they tolerate little discussion of rules, which they enforce with punishment or threats of punishment. In an alternative approach, **authoritative parents** can be demanding, too. They have high expectations of their children, which they enforce with consequences. But unlike authoritarian parents, they combine high standards with warmth and respect for the child's views: They are quite willing to listen to a child's ideas and feelings, and they often encourage a democratic family atmosphere. Authoritative parents usually place a heavy emphasis on reasoning and explaining to help their children learn to anticipate the consequences of their behavior.

Taking a third approach, **permissive parents** set few rules and allow the children to make their own decisions. Like authoritative parents, they are caring and communicative, but permissive parents give most decision-making responsibility to their children. Permissive parents believe that children can learn better from the consequences of their own actions than they can from following rules set by

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The amygdala, a part of the limbic system, is especially involved in the emotions of fear and aggression.

Socialization The lifelong process of shaping an individual's behavior patterns, values, standards, skills, attitudes, and motives to conform to those regarded as desirable in a particular society.

Authoritarian parent One of the four parenting styles, characterized by demands for conformity and obedience, with little tolerance for discussion of rules, which the parent enforces with punishment or threats of punishment.

Authoritative parent One of the four parenting styles, characterized by high expectations of the children, which the parent enforces with consequences, rather than punitive actions.

Authoritative parents combine high standards with warmth and respect for the child's views.

Permissive parent One of the four parenting styles, characterized by setting few rules and allowing children to make their own decisions. While they may be caring and communicative, permissive parents give most decision-making responsibility to their children.

TABLE 6.3 Features of the Four Parenting Styles

Style	Emotional involvement	Authority	Autonomy
Authoritative	Parent is warm, attentive, and sensitive to child's needs and interests.	Parent makes reasonable demands for the child's maturity level; explains and enforces rules.	Parent permits child to make decisions in accord with developmental readiness; listens to child's viewpoint.
Authoritarian	Parent is cold and rejecting; frequently degrades the child.	Parent is highly demanding; may use coercion by yelling, commanding, criticizing, and reliance on punishment.	Parent makes most decisions for the child; rarely listens to child's viewpoint.
Permissive	Parent is warm, but may spoil the child.	Parent makes few or no demands—often out of misplaced concern for child's self-esteem.	Parent permits child to make decisions before the child is ready.
Uninvolved	Parent is emotionally detached, withdrawn, and inattentive.	Parent makes few or no demands—often lacking in interest or expectations for the child.	Parent is indifferent to child's decisions and point of view.

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their parents. Finally, **uninvolved parents** tend to be either indifferent or rejecting, sometimes to the point of neglect or abuse (Maccoby & Martin, 1983). Typically, parents in this group lead such stress-filled lives that they have little time or energy for their children. (See Table 6.3.)

You can probably guess the usual outcomes of these different parenting styles. Research shows that children with authoritative parents tend to be confident, self-reliant, and enthusiastic. Overall, these children are happier, less troublesome, and more successful. Those with authoritarian parents tend to be anxious and insecure. Children with permissive or uninvolved parents are typically less mature, more impulsive, more dependent, and more demanding. Thinking back to our earlier discussion of attachment, these findings shouldn't be surprising. Generally speaking, authoritative parents take a more involved, interactive role in their children's lives—forming a stronger social-emotional attachment—than do the other three types of parents. This lays a strong foundation for prosocial behavior in the developing child.

Much of the early research on parenting styles was conducted in middle-class Western cultures, however. Can we expect the same findings elsewhere? Recent studies reveal that culture does play a role in parenting styles and parenting effectiveness, but not in the way you might think. Chinese, Hispanic, and Asian Pacific Island parents all tend to engage in stricter parenting than many Western parents, and from a distance may resemble the authoritarian parenting style. A closer look, however, reveals that these same parents typically combine their strict rules and demands for respect with a great deal of warmth—especially from fathers. When this combination is present, their children exhibit the same positive outcomes seen in Western children with authoritative parents (Berk, 2007). And in the United States, low-SES African American families exert high degrees of control over their children with positive results: These children do better in school and with peers than their counterparts who do not receive strict parenting.

Effects of Day Care As working parents make increasing use of day care for their children, we should ask the following question: How necessary is it to have a full-time caregiver? The question is an urgent one in many countries, including the United States, where over 60% of women with 1-year-old children work outside the home, and more children are cared for by paid providers than by relatives (Scarr, 1997, 1998).

Uninvolved parent One of the four parenting styles, characterized by indifference or rejection, sometimes to the point of neglect or abuse.

The research on this issue sends mixed messages. First the good news: Most children thrive in day care. Both intellectually and socially, they do as well as—sometimes better than—children raised at home by a full-time parent. Now the bad news: Poor-quality day care experiences can influence children to be aggressive, depressed, or otherwise maladjusted. Fortunately, a recent nationwide study of child care indicates that the overwhelming majority of day care centers do a fine job (Bower, 1996; NICHD Early Child Care Research Network, 2003).

As important as day care is in our society, it is comforting to note that having alternative caregivers does not in itself cause psychological problems. Rather, difficulties appear most often in poorly staffed centers where large numbers of children get little attention from only a few adults (Howes et al., 1988; NICHD Early Child Care Research Network, 2000). Another source of difficulty results from the unfortunate fact that children who are placed in the poorest-quality day care programs are most often from the poorest, most disorganized, and most highly stressed families. Developmental psychologist Laura Berk (2004) concludes that this volatile combination of inadequate day care and family pressure places some children at high risk for emotional and behavioral problems. Yet, she says, using this evidence to curtail day care services would be mistaken, because forcing a parent on a marginal income to stay home may expose children to an even greater level of risk.

All this means that day care is, in itself, neither good nor bad. It is the quality of care, whether given by a parent or a paid provider, that makes all the difference. Development expert Sandra Scarr (1998) says:

There is an extraordinary international consensus among child-care researchers and practitioners about what quality child care is: It is warm, supportive interactions with adults in a safe, healthy, and stimulating environment, where early education and trusting relationships combine to support individual children's physical, emotional, social, and intellectual development. . . . (p. 102)

Leisure Influences Children and adolescents in the United States and other industrialized countries have much more free time than do children elsewhere in the world. In nonindustrialized societies, children average some six hours a day working at some sort of chores or labor. By comparison, the typical American child spends less than one-half hour at such tasks. On the other hand, American children spend more time (on the average) doing schoolwork than did children in years past—although not as much as their foreign counterparts in other industrialized countries. Overall, though, the amount of free time available to U.S. children has increased dramatically over the last several generations (Larson, 2001). On average, American children today spend between 40 and 50% of their waking hours in discretionary activity.

What do children and teens do with all this leisure time? Almost 7 hours per day (averaged to include weekends) is spent with media: A majority of that time is spent watching television, with an additional 2 hours a day on the computer and playing video games (Kaiser Foundation, 2005). Reading for pleasure is moderately popular; it is more so for girls than boys, though, and declines for both sexes as children grow into adolescence (Nippold et al., 2005). Time spent playing decreases as a child ages, becoming replaced largely by media-oriented activities, which are often engaged in with friends as well. Overall, kids and teens spend twice as much time with media as they do with friends and family combined, and six times more than they spend in physical activity, reading, or doing homework.

What impact do these leisure-time activities have on a child's development? Research findings are mixed. Time with friends is associated with well-being at all ages (Rawlins, 1992) and may be especially important in adolescence. Playing sports, which kids and teens do for just over an hour a day on average, has



Time spent in physical activity typically decreases as children get older.

obvious benefits for health, as well as—depending on the sport and the environment—leadership, cooperation, and motivation. The effects of television, a topic of close scrutiny over the past few decades, seem to depend primarily on the type of programming being viewed. Educational television, which accounts for about 25% of children’s television viewing, has a positive impact on literacy and cognitive development (Linebarger et. al., 2004). Heavy viewing of entertainment television, on the other hand, is a strong predictor of later deficiency in reading ability for young children (Ennemoser & Schneider, 2007). And the hundreds of studies examining the impact of viewing violent television leave no doubt that it increases aggressive behavior in viewers (Strasburger, 1995). Moreover, viewing violent or nonviolent entertainment television prior to the age of the 3 is powerfully linked to attention problems later in childhood (Zimmerman & Christakis, 2007). We will examine the mechanics of this association in the next Psychology Matters feature.

Playing video games with violent content affects aggression in a manner similar to that of watching violent television. In addition, research shows that violent video games decrease players’ sensitivity to real-world violence (Carnagey et al., 2007) and also decreases prosocial (helping) behavior (Anderson & Bushman, 2001). On the other hand, frequent video-gaming appears to improve visual-spatial processing (Green & Bavelier, 2007). And not all video games are violent. Educational video games have been found to improve critical thinking and learning in a variety of subjects ranging from social studies to math. Once again, the message seems clear: The content matters more than the medium itself.

CONNECTION • CHAPTER 3

Habituation occurs when we become desensitized to a repeated stimulus so that it no longer produces the initial response.

Gender Differences in Socialization Anyone who has watched young boys and girls playing has noticed gender differences in their social interaction. The sexes usually prefer to segregate themselves—a pattern that holds across cultures (Maccoby, 1998, 2000). In their play, boys are typically more aggressive than girls, although there are certainly exceptions. Girls tend to organize themselves into small, cooperative groups. By contrast, boys often form larger groups that have a hierarchical structure, or “pecking order.” In these groups, individual boys continually compete for higher-ranking positions. They frequently resort to aggressive tactics, such as hitting, shoving, and verbal threats. Gender differences are noticeable in choices of leisure activities as well. Boys are more likely to play sports or computer games with their leisure time than girls are, whereas girls watch more television (Cherney & London, 2006). Evolutionary psychologists believe that these gender differences have an innate basis (Buss, 1999), which may be related, in part, to gender differences in testosterone levels (Dabbs, 2000). This does not mean, of course, that environmental factors, such as parenting styles and peer influences, make no difference. Social-cognitive theorists like Kay Bussey and Albert Bandura (1999) remind us that children also learn gender roles and gender-related behaviors, such as aggressiveness, competitiveness, or cooperation, from their social environments and role models.

Psychosocial Development in Childhood: Erikson’s Stages In the first section of this chapter, we introduced you to Erikson’s theory of lifespan development and examined his first stage of trust versus mistrust. In childhood, an individual progresses through three more of Erikson’s **psychosocial stages**. In each stage, children encounter a new “crossroad,” at which point they develop another key component in their schema regarding themselves and their relation to the world. What do these stages reveal about what the social world looks like through a child’s eyes?

Psychosocial stage In Erikson’s theory, the developmental stages refer to eight major challenges that appear successively across the lifespan, which require an individual to rethink his or her goals, as well as relationships with others.

Autonomy In Erikson’s theory, autonomy is the major developmental task of the second stage in childhood. Achieving autonomy involves developing a sense of independence, as opposed to being plagued by *self-doubt*.

Autonomy versus Shame or Self-Doubt In the second stage, which runs from about 18 months to 3 years of age, toddlers are rapidly learning to walk and talk. This increasing level of interaction with the world is laden with opportunities to directly influence outcomes. To develop a sense of independence, or **autonomy**—the main developmental task in this stage—children need the freedom (and sometimes the encouragement) to try to do things on their own when appropriate. Too much

restriction or criticism can lead to self-doubt, whereas harsh demands made too early, such as attempting toilet training before the child is ready, can lead to shame and discourage efforts to persevere in mastering new tasks; hence the name for this stage, *autonomy versus shame or self-doubt*. Children who enter this stage with a general sense of trust in the world are more likely to successfully develop autonomy than children who did not master the first stage.

Although Erikson didn't address the role of temperament in psychosocial development, we should point out its influence: We would expect shy children to need more gentle encouragement than bold children. Thus, although a nurturing and supportive environment is key to development of autonomy, nature plays a role as well.

Initiative versus Guilt Once a child has developed trust and autonomy, the third challenge is to develop **initiative**, or the ability to initiate activities oneself, rather than merely responding to others. During the preschool years, autonomous children will become more purposeful, wanting to choose what to wear, what to eat, or how to spend their time. The danger at this stage comes from overcontrolling adults, who demand an impossible degree of self-control (“Why can't you sit still?”), which can result in the child feeling overcome by inadequacy and guilt. The term for this stage reflects these two alternatives: *initiative versus guilt*. Caregivers' responses to self-initiated activities either encourage or discourage the freedom and self-confidence needed for the next stage.

Industry versus Inferiority Children who successfully master Erikson's first three stages enter elementary school ready to develop their skills and competencies in a more systematic way. From ages 6 to 12, school activities and sports offer arenas for learning more complex intellectual and motor skills, while peer interaction offers the chance to develop social skills. Successful efforts in these pursuits lead to feelings of competence, which Erikson called **industry**. Nurturing and supportive parenting at this stage helps children reflect on their experiences, learning from both their successes and failures and also recognizing that some failures are inevitable. On the other hand, children with overly demanding or disengaged parents may have trouble seeing their failures in perspective and ultimately develop a sense of inferiority. Likewise, youngsters who had trouble with one or more of the earlier stages may become discouraged spectators rather than performers, leading also to feelings of inferiority rather than competence. The term for this stage, therefore, is *industry versus inferiority*.

In summary, we have seen how development of language, cognitive skills, and social competencies all interact during the rapid growth and changes of childhood. Individual gains in each of these areas progress on a general biological timetable, but the pace and nature of the gains are heavily influenced by our environment. In the next section, we will see how these achievements of childhood lay the foundation for another period of rapid changes: the world of adolescence.

● PSYCHOLOGY MATTERS

● The Puzzle of ADHD

- ADHD, or **attention-deficit hyperactivity disorder**, is a psychological disorder found in 3 to 5% of school-age children in America, with cross-cultural prevalence similar at about 5% (Faraone et al., 2003). Symptoms of ADHD include
- poor impulse control, difficulty concentrating on a task for a sustained period
- of time, high distractability, and excessive activity. In boys, these symptoms often
- manifest themselves in disruptive behavior—such as the boy who frequently
- jumps out of his seat in class, blurts out answers, or interrupts a conversation.
- In girls, however—who comprise only about 20% of ADHD diagnoses—the dis-

Initiative In Erikson's theory, initiative is the major developmental task in the third stage of childhood. Initiative is characterized by the ability to initiate activities oneself, rather than merely responding to others or feeling *guilt* at not measuring up to other's expectations.

Industry Erikson's term for a sense of confidence that characterizes the main goal of the fourth developmental stage in childhood. Children who do not develop industry (confidence) will slip into a self-perception of *inferiority*.

Attention-deficit hyperactivity disorder (ADHD) A psychological disorder involving poor impulse control, difficulty concentrating on a task for a sustained period of time, high distractability, and excessive activity.

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ADHD is classified as one of several developmental disorders—a category that also includes autism and dyslexia.

order more often looks like lack of organization or a tendency to lose things. In both boys and girls, these difficulties bleed over into multiple domains, often resulting in poor academic performance and unstable peer relationships. In fact, the impact of symptoms on multiple domains in life is a key criterion for diagnosis of ADHD and necessary to distinguish true ADHD from commonly occurring symptoms of stressful lives or features of normal childhood development. The disorder seems to follow a predictable developmental path, with symptoms appearing in the early childhood years and, in roughly 50% of cases, spontaneously fading away as the child enters adolescence. Nonetheless, some individuals continue to exhibit symptoms of ADHD throughout adulthood.

ADHD has received quite a bit of public attention in recent years, and as a result, most people know something about it. As is often the case, though, the layperson's knowledge of a psychological disorder may rely on media reports, Hollywood portrayals, and the words of a well-meaning (but sometimes misinformed) friend or even teacher—and consequently isn't as factual as he or she thinks it is. And overconfidence in one's knowledge about something medical or psychological sometimes leads to self-diagnosis, which may or may not be accurate. Given the increasing numbers of our students who report having symptoms of ADHD, we think it's important to set the record straight about what ADHD is, what we know about its causes, and what research tells us about effective treatments.

Research to determine the causes of ADHD is in the early stages, although twin studies and other heritability research point to a strong genetic component. From a nurture perspective, prenatal exposure to nicotine and alcohol have been found to increase incidence of ADHD. And while some theories of environmental causes—such as a diet too high in sugar—have been debunked, recent research has revealed some provocative findings. As we know, the first few years of life are a time when the brain is developing synaptic connections at a furious pace. A recent longitudinal study with a nationally representative sample has now provided strong evidence that viewing noneducational television prior to the age of 3 predicts attention deficits later in childhood (Zimmerman & Christakis, 2007). What's more, the culprit wasn't only violent television—even non-violent entertainment programs and DVDs produced this effect. Researchers suggest that it is the fast-paced movement of entertainment programming driving the finding: In other words, watching programs that quickly and frequently switch from one scene to another—during a time when brain connections are forming—limits the brain's opportunities to create pathways for more extended focus and concentration. This explains why viewing similar amounts of educational television (which moves more slowly) did not increase incidence of attention deficits later in childhood. The study controlled for other factors that may influence development of attention deficits, such as family environment, parenting style, and cognitive stimulation. According to a companion study, 90% of children under 24 months regularly watch television, and half of what they view is entertainment television (Zimmerman et al., 2007).

Physiologically, how does an ADHD brain differ from a “normal” brain? One important difference has to do with the neurotransmitter dopamine, which is active when a person is engaged in an interesting task. People with ADHD seem to receive fewer and/or weaker dopamine bursts, which correlates with less engagement and long-term interest in a task. And while earlier research indicated that ADHD brains were smaller than non-ADHD brains, newer research reveals that ADHD brains develop normally and achieve normal size; they simply take a few years longer to do so in the cortical regions. The prefrontal cortex is slowest to develop in ADHD brains—up to five years later than non-ADHD brains—which fits with ADHD patients' difficulties staying focused on a multistep task requiring planning and follow-through. Interestingly, the motor cortex actually develops faster than normal in ADHD brains, which researchers suggest might explain the hyperactivity feature of ADHD (Shaw et al., 2007). Overall, the find-

ing that ADHD brains develop normally, albeit more slowly, may explain why some children with ADHD seem to “grow out of it” sometime in adolescence—but still leaves a puzzle as to why some do not.

Both medication and psychological treatments can be effective in treating ADHD, but optimal treatment varies considerably among individuals. Some do very well on medication, but careful monitoring and management by a physician with expertise in ADHD is highly recommended to match each patient with the right medication and the right dosage for that individual. Also, recent findings suggest periodic “trial withdrawals” to determine whether a child still needs medication (Swanson et al., 2007)—of course, trial withdrawals must be conducted with the close supervision of the prescribing physician.

Alternatively, behavioral therapy helps children with ADHD learn to control some of their problematic behaviors and replace them with more effective behaviors—for example, learning to recognize an impulse and count to ten before acting on it. Parents and other family members are crucial partners in effective behavioral therapy. Parents can set clear expectations and use principles of operant conditioning to help shape the child’s behavior, one step at a time. All members of the family can help provide redirection when the child loses focus and reinforcement for each success. As with any type of behavior modification program, though, consistency is important, which means the family must prioritize the time and attention necessary for treatment to be effective—which can be a challenge when a family is already juggling multiple tasks and priorities.

Behavioral therapy is the treatment of choice for very young children (for whom medication is not recommended). Also, it may be the best initial treatment for someone who has recently developed symptoms of ADHD; then, if it does not improve symptoms, medication may be added to the treatment plan. Indeed, one recent national study found that, for many, a combination of medication and behavior treatment works best (MTA Cooperative Group, 1999).

In closing, we offer a few notes of caution. First, although studies to date do not show any serious long-term effects of ADHD medication, it may be too soon to know for sure. We do know that children not taking ADHD medication grow about an inch taller, on average, than those who have taken medication such as Ritalin (Swanson et al., 2007). Also, families and teachers should keep in mind the power of labeling. When we label someone as having ADHD, especially without a valid diagnosis, we run the risk of the individual developing an identity consistent with the symptoms of ADHD, habits which later may be hard to overcome—even if the individual’s brain no longer fits the ADHD profile. Finally, a recent article offers what may be a more balanced perspective on the disorder:

[We must] remember that ADHD children possess many positive traits. They tend to be free-spirited, inquisitive, energetic and funny, as well as intelligent and creative. Their behavior is often spontaneous, helpful and sensitive. Many ADHD children are talented multitaskers, last-minute specialists and improvisationalists. Parents and educators should encourage these strengths and let their children know whenever possible that these qualities are highly valued (Rothenberger & Banaschewski, 2007).

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Behavioral psychology examines how we learn by association and by reward and punishment.

Check Your Understanding

1. **ANALYSIS:** Is the human ability for language innate or learned?
 - a. conservation
 - b. egocentrism
 - c. object permanence
2. **MATCHING:** Match the ability/limitation with the Piagetian stage at which it becomes an important characteristic of thinking:
 1. sensorimotor stage
 2. preoperational stage
 3. concrete operational stage

3. APPLICATION: Imagine that you are a family counselor. What parenting style would you encourage parents to adopt in order to promote confidence and self-reliance in their children?

4. ANALYSIS: According to research cited in this section, what is the best advice you can give parents about

whether their children should watch television and play video games?

5. UNDERSTANDING THE CORE CONCEPT: Which is most important for healthy development in childhood: nature or nurture?

Answers 1. We are born with specialized structures in our brain that are especially designed for language, but environmental factors—such as the frequency of exposure to language and the specific language spoken or signed in the environment—determine the specific pace and type of language that develops. Thus, it is both innate and learned. 2. $a = 3; b = 2; c = 1$ 3. authoritative 4. Educational television promotes literacy and cognitive development, but the viewing of entertainment television predicts later reading deficiencies in young children and has also been linked to the development of ADHD. Violent television increases aggression in viewers. Violent video games do the same and also decrease sensitivity to real-world violence and the likelihood of prosocial behavior. Educational video games can improve critical thinking and learning. 5. Nature and nurture both play critical roles in healthy development.

6.3 KEY QUESTION WHAT CHANGES MARK THE TRANSITION OF ADOLESCENCE?

Were all your developmental tasks finished by the time you entered *adolescence*? Most early theorists thought so. After that, they assumed, the psyche was set for life and would undergo few important changes. Modern research disputes these older views. Today's psychologists agree that we have a remarkable capacity for developmental change throughout our lifespan (Kagan, 1996, 1998). Again in adolescence the big changes lie in three important areas—as our Core Concept says:

core concept

Adolescence offers new developmental challenges growing out of physical changes, cognitive changes, and socioemotional pressures.

So, when does adolescence begin? Or, to put the question more personally, what event first made you think of yourself as an adolescent? Chances are that it had something to do with your sexual maturation, such as a first menstrual period or a nocturnal ejaculation. Psychologists mark the beginning of **adolescence** at the onset of puberty, when sexual maturity, or the ability to reproduce, is attained. However, they cannot so precisely identify the point at which adolescence ends and adulthood begins.

Adolescence and Culture

Variations among cultures compound the difficulty of specifying the span of adolescence. Although the physical changes that take place at this stage are universal, the social and psychological dimensions of adolescence depend on the cultural context. For example, if you enter your teen years in a society that celebrates puberty as the entry to adulthood and rewards you with the power to make responsible choices, you will have a very different experience from someone whose culture condemns teenagers as confused and potentially dangerous troublemakers.

In fact, most nonindustrial societies do not identify an adolescent stage as we know it. Instead, children in these societies move directly into adulthood with **rites of passage**. These rituals usually take place at about the time of puberty and serve as a public acknowledgment of the transition from childhood to adulthood. Rites of passage vary widely among cultures, from extremely painful rituals to periods of instruction in sexual and cultural practices or periods of seclusion involving survival ordeals. For example, in some tribal groups, the young person may be asked to take a meditative journey alone or to submit to sym-

Adolescence In industrial societies, a developmental period beginning at puberty and ending (less clearly) at adulthood.

Rite of passage Social ritual that marks the transition between developmental stages, especially between childhood and adulthood.

bolic scarring or circumcision surrounded by friends and family. Once individuals have completed the passage, there is no ambiguity about their status: They are adults, and the ties to their childhood have been severed.

Our own culture has some transition rituals, but their meanings are less well defined, and as a result they do not provide clear markers for the beginning of adolescent or adult status. Qualifying for a driver's license is one such rite of passage for many middle-class teenagers in America. Another, as you might recall, is high school graduation. Mexican American girls may celebrate *quinceañeras*, and Jewish American teens may celebrate bat mitzvahs or bar mitzvahs. All provide a young person with an added measure of freedom and independence that is not available to children, but none are necessarily aligned with the transition into or out of adolescence.

Although many issues loom large in adolescence, we will focus on a few of the most important developmental tasks that confront adolescents in the United States and the industrialized Western world: coming to terms with physical maturity, a new level of cognitive development, redefining social roles and emotional issues, dealing with sexual opportunities and pressures, and the development of moral standards. Each of these issues is just one component of the central task of establishing one's identity. We begin with the physical changes that mark the end of childhood and the onset of adolescence.

Physical Maturation in Adolescence

One of the first signs of approaching adolescence is the pubescent growth spurt. Two to three years after the onset of the growth spurt, **puberty**, or sexual maturity, arrives. Puberty for males begins with the production of live sperm (usually at about age 14 in the United States), while for girls it begins at **menarche**, the onset of menstruation (usually between ages 11 and 15). These serve as indicators that the *primary sex characteristics*—the sex organs and genitals—are undergoing dramatic change. Equally dramatic changes are occurring in the *secondary sex characteristics*: the enlargement of breasts and the widening of hips in girls, the deepening of the voice and appearance of facial hair in boys, and the sprouting of pubic hair in both sexes.

During adolescence, you may recall becoming more aware of your own appearance. Boys and girls alike often judge themselves harshly by the standards they think other people may be applying to them. And, unfair as it may be, physical attractiveness does influence the way people think about each other (Hatfield & Rapson, 1993). Thus, one of the most formidable tasks of adolescence involves coming to terms with one's physical self by developing a realistic yet accepting body image (one's personal and subjective view of one's own appearance). This image is dependent not only on measurable features, such as height and weight, but also on perceptions of other people's assessments and on cultural standards of physical beauty. During adolescence, dramatic physical changes and heightened emphasis on peer acceptance—especially acceptance by sexually attractive peers—intensifies concern with one's body image. And the age at which a teen goes through puberty has an impact on his or her body image: boys who mature earlier than their peers generally have a positive body image, whereas early-maturing girls often have a negative body image.

And note other gender differences: Approximately 44% of American adolescent girls and 23% of boys claimed that they have “frequently felt ugly and unattractive”; similar data have been found across many cultures (Offer et al., 1981, 1988). Physical appearance is clearly one of the biggest concerns among adolescents (Perkins & Lerner, 1995). Girls' self-concepts are particularly tied to perceptions of their physical attractiveness, while boys seem more concerned with their physical prowess, athletic ability, and effectiveness in achieving goals (Lerner et al., 1976; Wade, 1991). In general, girls and women



Body image becomes especially important in the teenage years.

Puberty The onset of sexual maturity.

Menarche The onset of menstruation.

are more dissatisfied with their weight and shape than are males, and they experience more conflict about food and eating (Rolls et al., 1991). These differences probably mirror a preoccupation with female beauty and male strength—an inevitable source of concern because not all adolescents can embody the cultural ideals of attractiveness. There are also cultural influences on self-concept: Some research indicates that the self-esteem of white adolescents of both sexes is more tied to physical attractiveness than is that of black adolescents (Wade, 1991). Although adolescents seem to become more accepting of their appearances over time, the attainment of acceptable body images can be a difficult task.

Adolescent Sexuality

A new awareness of sexual feelings and impulses accompanies physical maturity. In one large study, a majority of American adolescent males and females reported thinking about sex often (Offer et al., 1981). By age 17, about 40% of teens in the United States and Canada have had their first sexual experience, a figure that rises to about 75% by age 20 (Berk, 2007; Harvey & Spigner, 1995). Many of these teens, however, still lack adequate knowledge or have misconceptions about sex and sexuality.

Masturbation is the most common orgasmic expression of sexual impulses in adolescence (Wilson & Medora, 1990). By age 16, almost 90% of boys and 60% of girls in the United States report that they have masturbated (Janus & Janus, 1993). But the figures we have are only estimates and could well be low. You can imagine the problems scientists face in trying to get good data on such private sexual practices. Sex research typically involves anonymous surveys, which may not give a complete picture of behaviors that are often associated with shame and guilt.

Sexual orientation also begins to emerge in adolescence, with the majority of adolescents having a predominantly heterosexual orientation. Males and females, though, differ in their reports of their first sexual experiences. For the vast majority of females, emotional involvement is an important ingredient of sexual attraction. In contrast, for most males personal relationships appear to be less important than the sex act itself. In fact, the average male reports little emotional involvement with his first sexual partner (Miller & Simon, 1980; Sprecher et al., 1995).

The same cautions that apply to the data on masturbation also apply to the research on adolescents who report they are gay, lesbian, or bisexual. One study involved some 83,000 youth in grades 7 through 12, obtained by combining information from several smaller surveys (Reis & Saewyc, 1999). Overall, the study found that same-sex sexual activity was reported by between 1% and 5.3% of the respondents.

Same-sex sexual behavior does not necessarily mean that the individual considers him- or herself to be homosexual or bisexual. Some experiment with same-sex activity yet think of themselves heterosexual. For others, however, such experiences do fit with a gay, lesbian, or bisexual orientation. And still others remain unsure of their primary sexual orientation. Overall, one sample from the study cited above found that 8.5% of the respondents identified themselves as gay, lesbian, bisexual, or undecided.

Exclusively homosexual feelings are difficult to resolve during adolescence, when individuals are intensely concerned with the conventions and norms of their society. While most gay and lesbian individuals first become aware of their sexual orientation in early adolescence, many may not attain self-acceptance of their sexual identities until their middle or late 20s (Newman & Muzzonigro, 1993). The time lag undoubtedly reflects the relative lack of social support for a homosexual orientation and exemplifies the importance of society's role in all aspects of identity development.

Sexual orientation The direction of one's sexual interests (usually for individuals of the same sex, the opposite sex, or both sexes).

Cognitive Development in Adolescence

Changes that began in the womb continue to occur in the adolescent brain (Spear, 2000). While early childhood is the most rapid period for development of neural connections, the frontal lobes of the brain are the last to develop. What are the implications of this adolescent change in neurology?

Teens: Guided by Reason or Emotion? The frontal lobes are involved in social and emotional behaviors, as well as rational thinking and judgment. So, during adolescence (when these lobes have not fully developed), the teen brain is more likely to process information through the amygdala rather than through the more rational frontal cortex as they will later in adulthood. As a result, their reactions will be more emotional. In addition, brain-imaging studies indicate that teens' difficulty controlling their impulses is the inevitable consequence of the premature frontal cortex combined with the overactive amygdala. This, along with the increases in estrogen and testosterone levels, probably contributes to adolescents' sensation-seeking and risk-taking behaviors, as well as to increasing preoccupation with body image, sex, and social-emotional issues.

Piaget's Final Stage: Formal Operational Thought Adolescence brings with it Piaget's final stage of cognitive growth, involving the ability for abstract and complex thought. In this **formal operational stage**, the individual begins to ponder introspective problems, such as how to become better accepted by peers. Teens also become capable of dealing with abstract and intangible issues, such as fairness, love, and reasons for existence. Essentially, they learn to deal with hypothetical problems, rather than needing the concrete base of the previous stage. With these formal operational reasoning powers, adolescents and adults can now approach life's problems using more systematic thinking strategies. In the "20 questions" game we mentioned earlier, for example, they impose their own structures on the task, starting with broad categories and then formulating and testing hypotheses in light of their knowledge of categories and relationships. Their questioning moves from general categories ("Is it an animal?") to subcategories ("Does it fly?") and then to specific guesses ("Is it a bird?") (Bruner et al., 1966).

Current research, however, questions Piaget's notion that formal operational thought necessarily develops in adolescence. Some adults, it seems, never develop this capacity; instead, it appears dependent on education and experience. College-educated people are more likely to demonstrate formal operational thought, and in general, people are most skillful with abstractions and hypotheticals in their areas of expertise (Keating, 2004). Overall, development of this type of cognitive ability, more than any of Piaget's other cognitive tasks, appears highly reliant on cultural values and the environment.

Moral Development: Kohlberg's Theory

Is there a pattern in the development of our sense of right and wrong? The best-known psychological approach to moral development comes from the late Lawrence Kohlberg (1964, 1981), who based his theory on Piaget's view of cognitive development. After all, reasoned Kohlberg, moral thinking is just a special form of cognition. Mirroring Piaget's stages, each stage in Kohlberg's theory of moral reasoning is based on a different moral standard. Table 6.4 summarizes these stages.

What interested Kohlberg most were the ways that people reason about moral problems, rather than what they might do when led into temptation (Alper, 1985; Kohlberg, 1968). Accordingly, Kohlberg probed people's moral thinking by presenting people with a series of *moral dilemmas*, such as this one:

In Europe a woman was near death from a very special kind of cancer. There was one drug that the doctors thought might save her. It was a form of

Formal operational stage The last of Piaget's stages, during which abstract thought appears.

TABLE 6.4 Kohlberg's Stages of Moral Reasoning

Levels and stages	Reasons for moral behavior
I. Preconventional morality	
Stage 1: Egocentric pleasure/pain/profit	Avoid pain or avoid getting caught orientation
Stage 2: Cost/benefit orientation; reciprocity	Achieve/receive rewards or mutual benefits ("I'll scratch your back if you'll scratch mine")
II. Conventional morality	
Stage 3: "Good child" orientation	Gain acceptance, avoid disapproval
Stage 4: Law-and-order orientation	Follow rules, avoid penalties
III. Postconventional (principled) morality	
Stage 5: Social contract orientation	Promote the welfare of one's society
Stage 6: Ethical principle orientation (e.g., Gandhi, Jesus, Mohammed)	Achieve justice, be consistent with one's principles, avoid self-condemnation

radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid \$200 for the radium and charged \$2000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$1000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug, and I'm going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. Should Heinz have done that? Why? (Colby et al., 1983, p. 77)

Think about your own response to this situation before you read further.

Note that it made no difference to Kohlberg whether a person said that Heinz should or should not have stolen the drug. The problem is a genuine dilemma, so a well-reasoned case can be made on either side. For Kohlberg and his colleagues, the interesting part of an individual's answer was the moral thinking behind it. They found that the reasons given fell into six categories, corresponding to the following stages. See if you can tell where your own response to the Heinz problem fits:

- *Stage 1.* People reasoning at this stage think only of reward and punishment. They show no concern for others. In response to the Heinz dilemma they might say, "He should take the drug because he might get in trouble if he let his wife die." Or, on the other hand, "He shouldn't steal the drug because he might get caught and go to jail."
- *Stage 2.* The first sign of awareness of other perspectives shows itself at the second stage of moral reasoning. Still concerned about reward and punishment, the stage 2 person may seek personal gain by appealing to another person's self-interest, saying, in effect: "You scratch my back, and I'll scratch yours." Here is a sample stage 2 response to the Heinz case: "He should steal the drug because he is poor and needs his wife to help him make a living."
- *Stage 3.* The main concerns at this stage are seeking social approval and keeping everyone happy. Decisions are based on personal relationships, rather than on principle. A typical stage 3 response: "They won't blame him for stealing the drug, but everyone would think he is bad if he let his wife die."
- *Stage 4.* Maintaining social order is paramount at stage 4. In this stage people often emphasize laws, rules, policies, promises, duty, or respect for authority in their responses. Someone at stage 4 might say, "He shouldn't steal the

drug because it would violate the Ten Commandments,” or “He should steal the drug because his first obligation is to his wife.”

- **Stage 5.** Kohlberg called this the “social contract” stage because it emphasized the idea that rules and laws are flexible and can be changed by social consensus and by legislation. Emphasis at this stage is on fairness, rather than on the blind obedience of the previous stage. A possible stage 5 response to the Heinz dilemma: “He should take the drug, and the law should be interpreted to allow an exception under such desperate circumstances.”
- **Stage 6.** At this stage the individual bases a decision on universal principles of conscience that he or she would apply to all people in all situations. These are abstract and general principles, which often refer to the dignity and worth of each person, rather than concrete rules, such as the Ten Commandments. A possible stage 6 response: “He should take the drug because, if he doesn’t, he is putting a greater value on property than on human life.”

You can see how Kohlberg’s **stages of moral reasoning** parallel the stages of Piaget’s theory, as the individual moves from concrete, egocentric reasons to more other-oriented, abstract ideas of right and wrong. Accordingly, at the first stages, a child may not steal a cookie for fear of punishment, while at a more advanced level, the child may resist stealing for fear of not living up to the parents’ expectations. In general, the earliest stages of moral reasoning are based on self-interest, while later, more advanced stages center on others’ expectations or on broader standards of social good. Unfortunately, not all people attain the later, least egocentric stages. In fact, Kohlberg found that many adults never even reach stage 4.

Critiques of Kohlberg’s Theory Does moral development follow the same developmental sequence everywhere? Yes, said Kohlberg. Cross-cultural work shows that individuals attain the same stages in the same order in all cultures studied, including Turkey, Taiwan, Guatemala, Japan, and the United States (Eckensberger, 1994). However, this research also hints at some limitations of the theory to explain moral development in other cultural contexts: The higher stages, as defined by Kohlberg, have not been found in all cultures. Even in his native United States, Kohlberg found that stages 5 and 6 do not always emerge. Their emergence appears to be associated with high levels of verbal ability and formal education (Rest & Thoma, 1976).

One of the most stinging criticisms of Kohlberg’s theory has come from Carol Gilligan (1982), a colleague at Kohlberg’s own campus. Gilligan argued that the theory has a male bias and ignores uniquely feminine conceptions of morality. For women, says Gilligan, morality is embedded in social relationships and personal caring, which makes them appear to reach a plateau at stage 3. To his credit, Kohlberg responded by taking a fresh look at his data for stage 3 and stage 4. As a result, he redefined stage 4 by moving militant law-and-order responses (most often given by males) to stage 3. Most subsequent studies have found no significant sex differences in moral reasoning (Walker, 1989, 1991; Walker & de Vries, 1985).

A more telling critique suggests that research on moral reasoning may have limited practical value. Studies have found no close connection between people’s moral reasoning and their behavior. Moreover, most moral reasoning comes after people have intuitively decided how to act. Moral reasoning, then, may be little more than rational justification for an emotional decision, claims psychologist Jonathan Haidt (2001). In the arena of morality, says Haidt, it’s the “emotional dog” that wags its “rational tail,” not the other way around.

Social and Emotional Issues in Adolescence

As teens develop their own identity, the relative importance of others in their spheres of influence shifts. Family ties become stretched as the adolescent spends more time outside the home (Paikoff & Brooks-Gunn, 1991). What adolescents

Stage of moral reasoning Distinctive way of thinking about ethical and moral problems. According to Kohlberg, moral reasoning progresses through a series of developmental stages that are similar to Piaget’s stages of cognitive development.



According to Erikson, during the search for identity, adolescents must define their identities as individuals, even as they seek the comfort and feeling of belonging that comes from being with family and friends. One compromise might be to experiment with different norms—such as clothing and hairstyles—within the security of supportive relationships with companions, cliques, or romantic partners.

Identity In Erikson's theory, identity is a sense of who one is—a coherent self. Developing a sense of identity is the main goal of adolescence.

do with that time, however, depends on gender (Buhrmester, 1996). Friendships among girls are built on emotional closeness, with girls often getting together “just to talk.” By contrast, friendships among boys emphasize activities, with talk centering on personal achievements or those of others.

Do Parents Still Matter? Some developmental experts argue that the effects of parents, family, and childhood become nearly lost as the adolescent peer group gains influence (Harris, 1995). In American society, the adolescent encounters new values, receives less structure and adult guidance, and feels a strong need for peer acceptance. As a result, adolescents report spending more than four times as much time talking to peers as to adults (Csikszentmihalyi et al., 1977; Larson, 2001). With their peers, adolescents refine their social skills and try out different social behaviors. Gradually, they define their social identities, the kind of people they choose to be, and the sorts of relationships they will pursue.

Are parents still important to the adolescent? The answer is an unequivocal yes. Parents who continue to monitor their teens' activities, and maintain open and healthy communication through these years, are most likely to see their teenagers successfully navigate the challenges of adolescence. A high-quality parent–child relationship remains the strongest predictor of adolescent mental health (Steinberg & Silk, 2002).

Erikson's Psychosocial Development in Adolescence Erik Erikson noted the emergence of an independent self in adolescence and characterized it as the essential dilemma of adolescence. This search for **identity**, Erikson asserted, can be impeded by the confusion of playing many different roles for different audiences in an expanding social world. Thus, he called this stage *identity versus role confusion*. Resolving this *identity crisis* helps the individual develop a sense of a coherent self. While it is normal and healthy for one's identity to change throughout life, failure of the adolescent to find a satisfactory resolution for his or her identity issues may result in a self-concept that lacks a stable core. Resolution of this issue is both a personal process and a social experience (Erikson, 1963).

Is Adolescence a Period of Turmoil? Problems with loneliness, depression, and shyness can also become significant during adolescence, which is one reason for the sharp increase in suicide among teenagers (Berk, 2004; U.S. Bureau of the Census, 2002). Studies of adolescent suicide show that the triggering experience for such a tragedy is often a shaming or humiliating event, such as failure in some achievement or a romantic rejection (Garland & Zigler, 1993). The intensity of a young person's social and personal motives, combined with the overactive emotional brain, can make it hard to keep perspective and recognize that even difficult times will pass and that everyone makes mistakes.

Another factor also has a huge influence on adjustment: the biological changes associated with puberty, for which many teenagers are unprepared. An awakening interest in sexuality is amplified by the hormonal surges of adolescence. High levels of testosterone, particularly in boys, have been associated with risky and antisocial behavior. Again, however, relationships with parents are crucial: Testosterone-related problems are much more likely in teens who lack the stabilizing force of a solid relationship with their parents (Booth et al., 2003).

But is adolescence inevitably a period of turmoil? It is a period in which individuals are likely to have conflicts with their parents, experience extremes of mood, and engage in risky behaviors (Arnett, 1999). For some, adolescence certainly presents overwhelming problems in relationships and in self-esteem. Yet, for most teens these years are not a time of anxiety and despair (Myers & Diener, 1995). While many parents anticipate that the relationship with their children will encounter a rocky road when the children enter adolescence, the more typical experience is relatively tranquil. In fact, the majority of adolescent youth say

that they feel close to their parents (Galambos, 1992). In general, those who have the least trouble are adolescents with authoritative parents—who are responsive and, at the same time, hold their children to high standards. Those adolescents who have the most difficulty are most likely to come from homes where parenting is either permissive or authoritarian (Collins et al., 2000).

PSYCHOLOGY MATTERS

Using Psychology to Learn Psychology: Cognitive Development in College Students

Does your arrival at the formal operational stage, in the middle or high school years, signal the end of the cognitive line? Or will your thinking abilities continue to develop as you go on through college? If you are a returning student in your 30s, 40s, or beyond, will your cognitive development continue apace with your younger counterparts? A study by developmental psychologist William Perry suggests that your perspective on learning will change and mature as your college experience unfolds. This prediction is based on a sample of students who Perry followed through their undergraduate years at Harvard and Radcliffe. Specifically, he found that students' views of psychology and their other social science courses changed radically, as did their view of what they were there to learn (Perry, 1970, 1994).

At first, students in Perry's study had the most difficulty coming to grips with the diverse and conflicting viewpoints they encountered in their courses. For example, many confronted, for the first time, the idea that reasonable people can disagree—even about their most cherished “truths” concerning good and evil, God, nature, and human nature:

A few seemed to find the notion of multiple frames of reference wholly unintelligible. Others responded with violent shock to their confrontation in dormitory chat sessions, or in their academic work, or both. Others experienced a joyful sense of liberation. (Perry, 1970, p. 4)

In dealing with this academic culture shock, Perry's students passed through a series of distinct intellectual stages that were reminiscent of Piaget's stages. And, although they arrived at college at different levels of cognitive maturity and continued to develop at different rates, all progressed through the same intellectual stages in the same sequence. Here are some of the highlights of this intellectual journey:

- Students at first typically see a college or university as a storehouse of information—a place to learn the Right Answers. Thus, they believe it is the professor's job to help students find these answers.
- Sooner or later, students discover an unexpected—perhaps shocking—diversity of opinion, even among the experts. At this stage, college students are likely to attribute conflicting opinions to confusion among poorly qualified experts.
- Eventually, students begin to accept diverse views as legitimate—but only in the fuzzy areas (such as psychology, other social sciences, and humanities) where experts haven't yet found the Right Answers. They decide that, in subjects where the Right Answers haven't been nailed down, professors grade them on “good expression” of their ideas.
- Next, some students (not all) discover that uncertainty and diversity of opinion are everywhere—not just in the social sciences and humanities. They typically solve this problem in their minds by dividing the academic world into two realms: (a) one in which Right Answers exist (even though they haven't all been discovered) and (b) another in which anyone's opinion is as good as anyone else's. Often, at this stage, they perceive math and the “hard” sciences

- as the realm of Right Answers, leaving the social sciences and humanities in the realm of opinion.
- Finally, the most mature students come to see that multiple perspectives exist in all fields of study.

The students who achieve the final stage begin to see “truth” as tentative. They now realize that knowledge is always building and changing—even in the “hard” sciences. And they realize that a college education is not just learning an endless series of facts. Rather, it is learning to think critically about the important questions and major concepts of a field. In this text we have called them “Key Questions” and “Core Concepts.”

At what stage do you find yourself?

Check Your Understanding

1. **RECALL:** What is the major developmental task of adolescence, according to Erikson?
 - a. industry
 - b. autonomy
 - c. identity
 - d. intimacy
2. **ANALYSIS:** You are watching a television program and see an interview with a psychologist who has written a new book entitled, “The Teen Years: Face It, Parents—You Don’t Matter Anymore!” Is this point of view accurate, according to research?
 3. **RECALL:** About what percent of North American teens have had their first sexual experience by age 17?
 - a. 20%
 - b. 40%
 - c. 60%
 - d. 75%
 4. **APPLICATION:** Your next-door neighbor is a teenage boy who recently got arrested for shoplifting. In talking about it, he says, “I realize now I shouldn’t have done that. My parents are really mad at me, and my teachers think I’m a troublemaker.” Which of Kohlberg’s stages of moral development does this boy seem to be in?
 5. **UNDERSTANDING THE CORE CONCEPT:** What three categories of changes lead to the challenges faced in adolescence?

Answers 1. c 2. No, it is not accurate. Although peers become more influential in adolescence, parents still play a key role in their teens’ healthy development. 3. b 4. Kohlberg’s Stage 3 5. physical changes, cognitive changes, and socioemotional pressures

6.4 KEY QUESTION WHAT DEVELOPMENTAL CHALLENGES DO ADULTS FACE?

The transition from adolescence to young adulthood is marked by decisions about advanced education, career, and intimate relationships. Making such decisions and adjusting to the consequences are major tasks of adulthood because they shape the course of adult psychological development. But development doesn’t stop there. Continuing pressures of careers, families, and friends, along with the relentless physical maturation (and eventual decline) of the body continually present new developmental challenges. In today’s world, though, the traditional clock for aging has been set back, essentially “buying more time” for adults in all stages of adulthood. This revolution in aging is a key element in our Core Concept for this section:

core concept

Nature and nurture continue to interact as we progress through a series of transitions in adulthood, with cultural norms about age combining with new technology to increase both the length and quality of life for many adults.

A couple of points in our Core Concept should be noted before we examine adulthood in more depth. First, you have probably gathered from reading the earlier sections of this chapter that stage theories—although very popular for describing human development—are often guilty of oversimplification. While the major developmental tasks and categories of the leading stage theories, such as

those proposed by Piaget, Kohlberg, and Erikson, are largely holding up to empirical scrutiny, psychologists now agree that development doesn't occur in rigid stages. Rather, it is a more continuous process, occurring in waves or spurts. In other words, then, the stage theories may have gotten the “what” correct, but the “when” is more fluid than they thought it was. At no time in the lifespan is this more true than in adult development. Research on adult development indicates that healthy adults pass through a series of transitions as they progress from early through middle and into late adulthood. Successful passage through these transitions involves some reflection and readjustment, which we will discuss over the next few pages.

A second point worth noting is the changing nature of adulthood in the Western world. Thanks to better health care and technology, people are living longer than ever before and oftentimes enjoying better health during the later years than previous generations. This, in turn, is changing adults' perceptions of the lifespan and the various ages and stages involved in it. Fewer adults feel compelled to marry or settle down in their early 20s, or to retire when they hit 65. We are seeing the beginning of a “revolution” in aging, spawned by both nature (the longer lifespan) and nurture (the ways our culture is adapting to the change).

This **revolution in aging** is prompting renewed attention to the study of adult development in psychological science. Whereas for many years, we relied on theories based on clinical observation, we are now accumulating an increasing body of empirical research. Interestingly, much of the new research supports the traditional clinical theories—but it also sheds new light on the processes of adulthood in the 21st century. To see how these developmental changes unfold, let's begin with personality—where, for once, we find an area of agreement between Freud and psychologists who came after him.

Freud taught that adult development is driven by two basic needs: love and work. Abraham Maslow (1970) described the critical needs as love and belonging, which, when satisfied, allow the emergence of the needs for esteem and fulfillment. Other theorists divide the basic needs of adulthood into affiliation or social acceptance needs, achievement or competence needs, and power needs (McClelland, 1975, 1985; McClelland & Boyatzis, 1982). And in Erikson's theory, the early and middle adult years focus on needs for intimacy and “generativity.” Nearly every theorist has proposed some sort of social or affiliative need as a fundamental theme running through adulthood, and this and the other needs they identified play key roles in healthy adulthood. Because Erikson gave the most comprehensive account of adult development, we will use his theory as our framework, into which we will build recent empirical research that illuminates the course of adulthood today.

Early Adulthood: Explorations, Autonomy, and Intimacy

What are the developmental tasks of early adulthood? And perhaps a bigger question for 20-somethings is this: When exactly does adulthood begin? In our teen years, many of us look forward to the “freedom” of turning 18 and becoming a legal adult. But does psychological adulthood arrive at 18 as well?

Intimacy versus Isolation Early adulthood, said Erikson, poses the challenge of establishing close relationships with other adults (look again at Table 6.1 on page 241). He described **intimacy** as the capacity to make a full commitment—sexual, emotional, and moral—to another person. Making intimate commitments requires compromising personal preferences, accepting responsibilities, and yielding some privacy and independence—but it can also bring great rewards. To achieve intimacy, however, the individual must resolve the conflict between the need for closeness and the fear of the vulnerability and risks such closeness can bring. Failure to successfully resolve this crisis leads to *isolation* and the inability to connect to others in meaningful ways.

Revolution in aging A change in the way people think about aging in modern industrialized nations. This new perspective grows out of increased longevity, better health care, and more lifestyle choices available to older adults. It has also stimulated the psychological study of adult development.

Intimacy In Erikson's theory, the main developmental task of early adulthood, involving the capacity to make a full commitment—sexual, emotional, and moral—to another person.

For Erikson, the young adult must consolidate a clear sense of identity (by resolving the crisis of adolescence) before being able to cope successfully with the risks and benefits of adult intimacy. In essence, you must know who and what you are before you can be ready to make a commitment to love and share your life with someone else. However, the sequence from identity to intimacy that Erikson described may not accurately reflect present-day realities. The trend in recent years has been for young adults to live together before marrying and to delay making contractual commitments to lifelong intimacy with one person. In addition, many individuals today must struggle with identity issues (for example, career choices) at the same time they are trying to deal with intimacy issues. Life for young adults today offers more choices and more complications than did the same period of life for the generation described by Erikson.

Emerging Adulthood: The In-Between Stage Psychologist Jeffrey Arnett (2000, 2001), in recognition of the differences between adulthood today and in previous generations, has proposed a transitional period to adulthood that he calls **emerging adulthood**. This period encompasses the late teens through the 20s, a time during which many individuals in industrialized societies have passed through adolescence but do not yet perceive themselves to be adults. Whereas in earlier historical times, visible events such as marriage, the birth of the first child, and establishment in a career were perceived as the markers of entrance into adulthood, today's young people cite more opaque events such as accepting personal responsibility for themselves and making independent decisions as the most important indicators of adulthood. And most emerging adults today report only partial progress toward these milestones of self-sufficiency (Arnett, 1997).

Emerging adulthood is a time of exploration and experimentation in all areas. Late teens and 20-somethings are trying out different types of work, exploring alternative lifestyles and worldviews, and figuring out what kind of person is right for them romantically. As they do so, they are less predictable in their educational pursuits, choice of residences, and degree of financial responsibility than at any other time in their life. Almost half will move out of their parents' home and back in again during this period, and while 60% start taking college classes within one year after graduating from high school, only half of these students have completed four or more years by their late 20s (Bianchi & Spain, 1996; U.S. Bureau of the Census, 1997). Of those who do graduate from college, though, more are choosing graduate school than in previous generations (Mogelonsky, 1996). They are also more likely to take risks than at any other time of their life—including adolescence. Rates of alcohol and substance abuse, reckless driving, and unprotected sex peak during these years (Arnett, 1992). This latter finding might be explained by the absence of serious role responsibilities combined with freedom from parental supervision.

Did Erikson get it right, then, in his identification of the major tasks of adolescence and early adulthood? In general, he did. Although not widely noted, he observed that, in industrialized societies, young people seemed to enjoy what he called a prolonged period of adolescence during which role experimentation continued. This, indeed, is exactly what empirical research such as that of Arnett is demonstrating today. And current studies indicate that, by about age 30, a majority of Westerners have married and had their first child, have made the transition from school to full-time work, and perceive themselves as having entered adulthood. Presumably, then, at this point they have achieved the intimacy that Erikson described as the major developmental task of early adulthood. Notably, they also name intimacy, or personal relationships, as the key to a happy life (Arnett, 2000b), although many struggle with balancing intimacy with the need for autonomy. As we will see, this pursuit of an optimal balance of the two needs will continue to characterize later phases of adulthood.

Modern Approaches to Intimacy How, then, do today's adults achieve intimacy? Though 95% still marry, marriage often occurs more than once in an indi-

Emerging adulthood A transition period between adolescence and adulthood.

vidual's life. The same pattern applies to gay and lesbian long-term relationships—whether they may legally marry in their state or not (Knox & Schact, 2008). In fact, half of all U.S. marriages end in divorce (U.S. Bureau of the Census, 2002). Moreover, an increasing number of couples are cohabitating rather than getting married (Doyle, 2002b). The high divorce rate probably results in part from individuals seeking intimacy before they have resolved their own identities. Unrealistic expectations of each other and of what constitutes an ideal marriage and family structure contribute to divorce as well (Cleek & Pearson, 1985), as does our cultural priority on individual happiness. On the other hand, there is evidence that communication and affection between spouses is now better than it was in earlier times and that those who have learned good communications skills have substantially improved their chances of avoiding divorce (Caplow, 1982; Markman & Notarius, 1993).

Married people are now more likely to see each other as partners and friends and less likely to feel constrained by the stereotype of what society expects of a “husband” or “wife.” Partners in **peer marriages** talk with and help each other in ways that work best for their relationship, irrespective of traditional ideas about the man being “boss” or the wife being responsible for “women’s work” (Schwartz, 1994). The key to such a fair and satisfying relationship is communication in which both partners feel able to openly express their hopes and fears (Klagsbrun, 1985). A mushrooming of knowledge on how good communication can maintain relationships has helped our culture to view marriage as a worthwhile investment and therapy as a valuable option for supporting such efforts (Gottman, 1994; Notarius, 1996). In brief, relating is no longer viewed as a set of skills that “comes naturally” with the establishment of intimacy. Instead, close relationships are seen as lifelong works in progress, worthwhile investments of time and energy whose quality can be improved with clearer self-understanding, effective conflict resolution, and good communication.

What makes for good communication and effective conflict resolution? Surprisingly, there is no correlation between the frequency of a couple’s conflicts and the health of their relationship: Couples who disagree often are no more likely to divorce than couples with less frequent conflict. What does matter is the ratio of positive interactions to negative interactions, with the optimal balance found to be 5:1 (Gottman, 1995). In other words, regardless of how much conflict there is in a marriage, the marriage will be healthy if the couple has five times more positive than negative interactions with each other. And “positive interactions” don’t have to be long romantic weekends or elaborate dates: small things such as a smile, a kiss, a compliment, or a thank-you all qualify as positive interactions. (A long romantic weekend or a great date would, then, presumably have quite a few positive interactions.) Negative interactions, on the other hand, can also be small—but pack a powerful punch—and include such behaviors as hostile sarcasm, name calling, a frustrated roll of the eyes, or an angry slam of the door. By maintaining a 5:1 ratio of positive to negative interactions, the couple is creating a supportive foundation that strengthens the relationship’s immune system, so to speak. When conflict does arise, then, partners are less likely to take things personally or feel defensive, which allows the focus to remain on problem solving rather than blaming.

The Challenges of Midlife: Complexity and Generativity

For many people, the concept of midlife conjures up thoughts of the dreaded midlife crisis and birthday cards poking fun at being “over the hill.” Contrary to stereotypes of middle age, though, research finds middle adulthood to be a peak period of development in many respects. Research in cognitive development reveals that many adults in this age range have developed considerable skill in combining and integrating a variety of thinking styles, including reflection, analysis, and dialectical reasoning (which is the ability to compare and evaluate con-



This happy couple can expect a successful marriage if they maintain a 5:1 ratio of positive to negative interactions with each other.

Peer marriage Marriage in which the couple see each other as partners and friends, as contrasted with the older stereotypic roles of “husband” and “wife.”

tradictory viewpoints) (Baltes & Staudinger, 1993; King & Kitchener, 1994). They are also experts at integrating their cognitions and emotions, resulting in more thoughtful, deliberate, and reflective coping responses to stressful events (Diehl et al., 1996).

Taken together, these skills enable the midlife adult to juggle a variety of interests, which often include work, family, community, hobbies, and self-care. And indeed, this busy, complex lifestyle is what characterizes healthy midlife adults today. Psychologists Rosalind Barnett and Janet Hyde (2001) note that dual-career families are now the norm, with women receiving professional training at an unprecedented level. Hand in hand with this trend is the increasing fluidity among roles as worker and family member: Men less often define themselves only as workers and family providers, and women are less likely to define themselves solely as wives and mothers. For most people, these expanded roles provide a greater network of social support and an increased sense of well-being. In addition to greater diversity in roles, midlife adults today enjoy greater variety in their relationships, resources, and lifestyle than ever before (Moen & Wethington, 1999). This *complexity* is related to well-being in that complex individuals see life as a series of challenges, full of variety, that lead to growth (Ryff & Heincke, 1983).

Generativity versus Stagnation According to Erikson, **generativity** is the major developmental task of middle adulthood. For those who have successfully met the earlier challenges of identity and intimacy, generativity is an opportunity to make a meaningful and lasting contribution to family, work, society, or future generations. Thus, people in this phase of life broaden their focus beyond self and partner, often by raising children, serving as volunteers in community service groups, or nurturing the next generation in some other way. Research confirms that adults who express a strong sense of being generative and productive also report high life satisfaction (McAdams et al., 1993). In contrast, those who have not resolved earlier crises of identity and intimacy may experience a “midlife crisis.” Such people may question past choices, becoming cynical and stagnant or, at the other extreme, self-indulgent and reckless. The good news is that—once again contrary to stereotypes of midlife—most people do not undergo a midlife crisis. What’s more, the idea that adults become depressed and lose direction when their children “leave the nest” is also a myth (Clay, 2003a,b).



Engaging in new challenges is one of the keys to successful passage through the transitions of adulthood.

Generativity The process of making a commitment beyond oneself to family, work, society, or future generations. In Erikson’s theory, generativity is the developmental challenge of midlife.

Transition An individual’s redefinition or transformation of a life role.

Transitions What does happen for most adults in midlife is that they progress through a **transition**, which involves redefining, or transformation, of a life role. Indeed, there is evidence that adult life is characterized by a series of transitions, starting with the transition to adulthood and occurring perhaps every 15 to 20 years throughout adulthood (Levinson, 1986; Sugarman, 2001). Successful transitions typically involve a period of heightened self-reflection, which includes a reappraisal of the current role, exploration of new possibilities that offer a renewed sense of meaning, and the decision making involved in letting go of the old role and making a commitment to the new one. Transitions may involve expected events such as getting married, having children, or retiring, or unexpected events such as a sudden illness, breakup, or loss of a job or loved one. In addition, events that were expected but that did not occur—such as a job promotion that never materialized or a person who always wanted children but never had any—can prompt a transition. And finally, transitions can be gradual, as with a relationship or job that over time becomes less and less fulfilling or a person who becomes increasingly self-confident: In any case, at some point the individual becomes aware of a critical difference.

Given that our physical, cognitive, and emotional capabilities—as well as our social contexts—tend to evolve and change throughout our life, transitions are seen as a natural response to these shifts in our internal and external worlds. And there is accumulating evidence that adults who live the longest and health-

iest lives are the ones who successfully navigate through these transitions and emerge from each one with a renewed sense of meaning and passion for life (Levinson, 1978, 1996; Ryff & Heidrich, 1997). Interestingly, transitions may sometimes involve a revisit to one of Erikson's earlier stages, such as a retooling of one's identity or the transformation of an intimate relationship. And, given what we know about complexity, we might predict that complex individuals—with their positive, challenge and growth-oriented outlook—would be more likely to experience successful transitions.

In summary, the reality of middle adulthood in today's Western society is a far cry from the "over-the-hill" stereotype that still persists in some people's minds. Many midlife adults are energetic, forward-moving individuals who are making meaningful contributions to the world and enjoying the many opportunities available to them in love, work, and personal growth. And it appears to be generativity and complexity that fuels achievement of this healthy model of middle adulthood.

Late Adulthood: The Age of Integrity

At the beginning of the 20th century, only 3% of the U.S. population was over 65. One hundred years later that figure is about 13%. As the baby boom generation reaches this age over the next few years, nearly one-fourth of our population will be in this oldest group.

If you are now a 20-something college student, you will be in your 40s by the year 2030, and you will have witnessed a profound demographic shift (change in population characteristics). By that time, more than 80 million Americans will be over 60 years of age. For the first time in history, the number of people in the 60-plus age group will outnumber those under 20 years of age. This will represent a dramatic reversal of all previous demographics and a potentially significant shift away from today's youth-oriented culture (Pifer & Bronte, 1986). Among the effects: Tattoos and body piercings will become common in nursing homes, and there will also be far fewer people to pay the Social Security and Medicare bills.

With drastic changes in our society's age distribution looming, it is more crucial than ever to understand the nature of aging as well as the abilities and needs of the elderly (Roush, 1996). And, on a personal level, it may be helpful to anticipate some of the developmental challenges your parents and grandparents are facing, as well as what you will face in the last phase of your life.

From a biological perspective, aging typically means decline: Energy reserves are reduced, and cell machinery functions less efficiently. From a cognitive perspective, however, aging is no longer synonymous with decline (Qualls & Abeles, 2000). Many abilities, including expert skills and some aspects of memory, may actually improve with age (Azar, 1996; Krampe & Ericsson, 1996). A lifetime's accumulation of experience may finally culminate in wisdom—if the mind remains open and active. Activity, in fact—whether physical, social-emotional, or cognitive—seems to be key to healthy aging: The phrase "Use it or lose it!" applies to many aspects of late adulthood. Thus, we see that theories of aging are models of balance or trade-offs: In old age, a person may lose energy reserves but gain an ability to control emotional experiences and thereby conserve energy (Baltes, 1987). And many of our negative assumptions about aging are related to our cultural values: Cultures that revere their elders have very different perspectives and expectations of aging. What are the tasks of aging, and what resources and limitations must we confront as we look ahead to the autumn of our lives?

Ego-Integrity versus Despair According to Erikson, an increasing awareness of your own mortality and of the changes in your body, behavior, and social roles will set the stage for late adulthood. Erikson called the crisis he identified at this

stage *ego-integrity versus despair*. **Ego-integrity**, the healthy end of this dimension, involves the ability to look back on life without regrets and to enjoy a sense of wholeness. It requires reflection on times both good and bad, with appreciation for what turned out well and acceptance of what did not. By now, you know that Erikson believed that previous crises must have had successful resolutions in order to master new challenges, so you are probably considering how a well-developed identity, meaningful close relationships, and a sense of having contributed to the next generation would probably facilitate this type of reflection and acceptance. For those whose previous crises had unhealthy solutions, however, aspirations may remain unfulfilled, and these individuals may experience futility, despair, and self-deprecation. Sadly, they often then fail to resolve the crisis successfully at this final developmental stage.

Physical Changes Some of the most obvious changes that occur with age affect people's physical appearances and abilities. As we age, we can expect our skin to wrinkle, our hair to thin and gray, and our height to decrease an inch or two. Our hearts and lungs operate less efficiently, so we can expect decreased physical stamina. We can also expect some of our senses to dull. These changes occur and develop gradually, so we have ample opportunity to gauge them and try to adjust. Successful aging takes into consideration both individual potential and realistic limits (Baltes, 1993). Two of the most noticeable sensory deficiencies occur with vision and hearing.

As we age, the lenses in our eyes become discolored and less flexible, affecting both color vision and distance vision. Most people over 65 experience some loss of visual acuity, and without corrective lenses half of the elderly would be considered legally blind. Glasses do aid in adjusting to these changes in vision, however, especially for night driving or close work such as reading.

Diminished hearing is common among those 60 and older, especially the ability to hear high-frequency sounds. Problems can ensue if the loss is undetected or denied (Maher & Ross, 1984; Manschreck, 1989). Those with a hearing loss might explain others' actions inaccurately because they lack information or blame their misinterpretations on evil intentions instead of simple bad hearing (Zimbardo et al., 1981). The problem can escalate if a person then begins to believe that others are deliberately whispering to avoid being heard, leading to a mild form of paranoia (belief that one is being victimized). Fortunately, early hearing-aid therapy can be more effective than later psychotherapy. Hearing aids can compensate for much of one's hearing loss. Unfortunately, though, hearing aids—though increasingly needed by our population—are rarely covered by medical insurance and often cost several thousand dollars. In addition, those close to someone with a probable hearing loss can help that person by speaking in lower-pitched tones, enunciating clearly, and reducing background noise.

Are declines in other physical capabilities inevitable as well? Not as much as previously thought. Continuing (or even beginning) a consistent program of physical exercise helps older adults ward off some of the physical decline typically associated with aging. Aerobic activity such as walking or swimming improves cardiovascular functioning, and weight training improves blood flow and builds muscle mass, which in turn improves posture, balance, and the ability to physically manage everyday activities (such as grocery shopping or gardening). Even for individuals who have previously been sedentary, beginning an exercise program as late as age 80 results in measurable gains physically, emotionally, and even cognitively. New research indicates that regular exercise provides better blood and oxygen flow to the brain, which in turn reduces deterioration of brain cells and improves attention (Colcombe et al., 2004). There is also evidence that exercise reduces incidence of Alzheimer's and other brain disorders (Marx, 2005).

Another myth about aging in Western culture is that elderly people cannot or should not be sexually active. Belief in such a myth can be a greater obsta-

Ego-integrity In Erikson's theory, the developmental task of late adulthood—involving the ability to look back on life without regrets and to enjoy a sense of wholeness.

cle than any physical limitations to experiencing satisfying sex in late adulthood. Although frequency and desire may decrease somewhat, there is no age, for either men or women, at which the capability for arousal or orgasm ceases. (This is particularly true now that drugs, such as the well-advertised Viagra, have enhanced erectile ability for millions of older men.) And while sex loses its reproductive functions in late adulthood, it doesn't lose its capacity for providing pleasure. Regular sexual practice also enhances healthy aging because it provides arousal, aerobic exercise, fantasy, and social interaction (Ornstein & Sobel, 1989). Experience and creativity clearly compensate for minor physical changes or losses of physical stamina.

Cognitive Changes Older adults often fear that aging is inevitably accompanied by the loss of mental abilities. But is this fear justified? Certain parts of the brain, particularly the frontal lobes, do lose mass as we age, but there is little evidence that this causes a general mental decline in healthy adults. Performance on tasks requiring imagination, such as vivid imagery strategies for memorizing, does seem to decline with age (Baltes & Kliegl, 1992). And people do acquire information more slowly by the time they are in their 70s and 80s. By that age, many older people—but not all—begin to show some decline in cognitive abilities. The older the group, the more variation we find (Kramer & Willis, 2002). But on the other hand, the decline for the average person may not be as severe as folk wisdom had assumed (Helmuth, 2003c). Brain imaging studies suggest that older people's brains compensate by processing information differently, bringing more regions into play (Cabeza, 2002; Helmuth, 2002). In fact, there is new research showing that moderate physical fitness training improves cognitive abilities in older adults and may forestall or even prevent age-related mental decline (Colcombe et al., 2004). Moreover, some abilities improve with age. Vocabulary, for example, is consistently better in older adults, as are social skills. And, with regard to skilled performance, musicians have been shown to improve well into their 90s (Krampe & Ericsson, 1996). Psychologists are now exploring age-related gains in wisdom, such as expertise in practical knowledge and life experience (Baltes, 1990).

What about memory? A common complaint among older adults is that their ability to remember things is not as good as it used to be. Most of these age-related memory difficulties appear in a part of the memory system that processes and stores new information (Poon, 1985), whereas aging does not seem to diminish access to knowledge or events that occurred long ago. So, an elderly person may have to ask the name of a new acquaintance several times before finally remembering it but have no trouble recalling the names of old friends. A more important concern might be that people explain memory loss differently depending on the age of the forgetful person. Using a double standard, younger adults attribute other young adults' memory failures to lack of effort but those of older adults to loss of ability (Parr & Siegert, 1993).

Particularly worrisome to older people and those who love them is **Alzheimer's disease**, a degenerative disorder of the brain that produces diminished thinking abilities, memory problems, and ultimately, death. Alzheimer's disease is estimated to occur in about 4% of the population over the age of 65, with the incidence increasing with age to over 50% in people beyond age 85 (National Institute on Aging, 2004). One of the early signs involves memory problems, causing many older persons to become anxious when they are unable to remember a name or an event—a difficulty to which they would have given little thought when younger. It is an especially frightening disorder because it can render people helpless, rob them of their ability to make new memories, and make them forget loved ones. New advances in Alzheimer's research, though, are making some promising headway into our understanding and treatment of this serious disorder. Although a cure has not yet been discovered, early diagnosis and treatment can now slow the progress of the disease, thus extending the quality of life of the Alzheimer's patient.



Older adults who pursue higher degrees of environmental stimulation tend to maintain higher levels of cognitive abilities.

Alzheimer's disease A degenerative brain disease usually noticed first by its debilitating effects on memory.

Social and Emotional Changes An unfortunate consequence of living a long life is outliving some friends and family members. In addition, the reduced mobility associated with aging can make people become somewhat less socially active in later adulthood. While older adults reduce the extent of their social contacts, they remain more invested in those ties they choose to keep. Maintaining even a single intimate relationship can markedly improve personal health, as can living with a beloved pet (Siegel, 1990). Research shows that as people age, they tend to engage in **selective social interaction**, maintaining only the most rewarding contacts for the investment of precious physical and emotional energy (Carstensen, 1987, 1991; Lang & Carstensen, 1994).

Emotionally, another stereotype of aging sees old age as a time of depression and restriction of emotions. The evidence, however, doesn't support this view in healthy older adults. Age often improves people's ability to control their emotions—when they want to (Lawton, 2001). Moreover, older individuals report experiencing more positive emotions and fewer negative emotions than do younger adults (Mroczek, 2001).

How do older adults characterize well-being? In a series of interviews with middle-aged and older men and women, Ryff (1989) found that nearly everyone of both sexes defined well-being in terms of relationships with others: They strived to be caring, compassionate people and valued having a good social support network. Respondents also emphasized the value of accepting change, enjoying life, and cultivating a sense of humor.

Keys to Successful Aging In addition to the information already presented, what other strategies have been found to be effective in coping with aging? Older adults can remain both active and close to people by doing volunteer work in the community, traveling, joining clubs and classes, or spending time with grandchildren. Much research supports this notion of the need for close relationships with others. And it is the basis for one of the most practical applications that you can take with you from this text: *Anything that isolates us from sources of social support—from a reliable network of friends and family—puts us at risk for a host of physical ills, mental problems, and even social pathologies.* We are social creatures, and we need each other's help and support to be effective and healthy (Basic Behavioral Science Task Force, 1996). In addition, we might learn lessons from other cultures where older citizens are respected and venerated for their wisdom. Before this happens, however, people must overcome stereotypes of the elderly as incapable and incompetent (Brewer et al., 1981).

Perhaps successful aging, much like success at any age, consists of making the most of gains while minimizing the impact of losses (Schulz & Heckhausen, 1996). Additionally, it is helpful to realize that losses of specific abilities need not represent threats to one's sense of self. As one's physical and psychological resources change, so do one's goals (Carstensen & Freund, 1994). In this fashion, late adulthood may be a time not of increasing frustration but of increasing fulfillment.

● PSYCHOLOGY MATTERS

● A Look Back at the Twin Studies

● Now that you have learned some key elements of human development over the lifespan, what conclusions can you draw about the similarities of the Jim twins reported at the beginning of this chapter? Are we all simply products of our genes, destined to develop on a preprogrammed path despite environmental influences? By now, you have enough knowledge about the interaction of genes and environment to know that is not the case. How, then, can the remarkable similarities of the “Jim twins” and media reports of others like them be explained?

Selective social interaction

Choosing to restrict the number of one's social contacts to those who are the most gratifying.

To see these twin pairs in a broader perspective, you need to know that they are “outliers”—extreme among the twins studied at Minnesota, even though they have received a lion’s share of media coverage. Although Bouchard and his colleagues found many unexpected developmental similarities between individuals in all the twin pairs they studied, most were not nearly so much alike as Oskar and Jack or the Jims. Bouchard acknowledges that many of the similarities are just coincidences (The Mysteries, 1998). It is precisely such coincidences that make the news and catch our eye. But, says twin researcher Richard Rose, “If you bring together strangers who were born on the same day in the same country and ask them to find similarities between them, you may find a lot of seemingly astounding coincidences” (Horgan, 1993). While mere coincidence does not offer a very dazzling explanation, the alternatives seem absurd. No one seriously suggests, for example, that the names of Betty and Linda could have been written into the genes of the two Jims or that heredity really specifies storing rubber bands on one’s wrists.

The real story, then, is both less dramatic and more important: Identical twins do show remarkable similarities, but mainly in the characteristics you might expect: intelligence, temperament, gestures, posture, and pace of speech—all of which do make sense as traits that could be genetically influenced. And the fact that fraternal twins and other siblings show fewer similarities also suggests that hereditary forces are at work in all of us, whether we are twins or not. Bouchard (1994) himself takes a rather extreme position, suggesting that heredity accounts for up to 80% of the similarities observed among identical twins (What We Learn, 1998). Critics aren’t so sure.

What objections do the critics raise concerning the twin studies Bouchard and his colleagues have been conducting? First, they note that, stunning as the similarities between identical twins may seem, the effect of the environment also shows up in each pair of twins. None of the twin pairs displays behavior that is identical across the board. And the fact that twins reared together typically are more alike than those reared apart provides further testimony to the effect of environment. Furthermore, the personalities of most twin pairs become less alike as they age, providing additional evidence that the environment, as well as heredity, is at work (McCartney et al., 1990). We should note, too, that many of the twin pairs studied by Bouchard had been reunited for some time before he found them—an environmental condition that could easily accentuate, or even create, similarities. This was true, for example, of Oskar Stör and Jack Yufe, the Nazi and Jewish twins, who met five months before Bouchard got to them. In fact, says psychologist Leon Kamin, Bouchard’s twins face strong incentives to exaggerate their similarities and minimize their differences to please the research team and to attract media attention (Horgan, 1993). (Since their story broke in the press, Stör and Yufe have hired agents, made paid appearances on TV, and sold their story to a Hollywood film producer.)

A second criticism points out that because identical twins look alike, people often treat them alike. This is an environmental factor that can easily account for many similarities in behavior. For example, some people’s faces look good with moustaches, and, if a pair of twins has such faces, people may encourage them to grow moustaches—whether or not they have been raised together. The resulting similarity, then, can be due as much to environment as it is to heredity.

Finally, the critics also remind us that scientists’ hopes and expectations can influence their conclusions in this sort of research. Because Bouchard and other investigators of identical twins expect to find some hereditary influences, their attention will be drawn more to similarities than to differences. In fact, this is what most people do when they meet: Their conversation jumps from topic to topic until they discover common interests, attitudes, experiences, or activities.

So, is there any point of consensus about the twin studies and about the effects of heredity and environment? Bouchard and his critics all would say that neither heredity nor environment ever acts alone to produce behavior or mental

CONNECTION • CHAPTER 1

Expectancy bias can distort perceptions and research findings.

- processes. They always interact. That is, from a developmental perspective,
- heredity and environment work together throughout a person's life. In addition,
- most would agree that the important findings coming out of the Minnesota twin
- research have nothing to do with unique and amazing similarities between par-
- ticular twins. Rather, they have to do with the similarities found across all the
- identical twin pairs they studied: Twins show extraordinary similarities with each
- other in personality, attitudes, facial expressions, and temperament—almost
- everything, oddly enough, except their choice of mates: The spouses of identical
- twins were no more similar to each other than were people who would have
- been chosen at random (El-Hai, 1999). What the twin studies really did was to
- remind us that we are products of both heredity and environment—nature and
- nurture.

Check Your Understanding

1. **ANALYSIS:** How is emerging adulthood different than early adulthood?
2. **APPLICATION:** The couple who lives next door to you has a very successful marriage: They have been together over 25 years, have raised three well-adjusted children, and spend a lot of time together doing things they both enjoy. When a friend of yours visits, though, and notices them arguing in the backyard—which they often seem to do—she asks you how they can have such a good marriage but argue so much. How can you explain that to her?
3. **RECALL:** What are the keys to successful middle adulthood?
4. **RECALL:** Describe at least two ways that the phrase “Use it or lose it!” applies to healthy aging.
5. **UNDERSTANDING THE CORE CONCEPT:** Describe two factors that contribute to the current “revolution” in aging.

Answers 1. Emerging adulthood is a transitional period between adolescence and early adulthood, during which individuals in industrialized societies experiment with different roles, viewpoints, and relationships. 2. They probably maintain a ratio of 5:1 positive to negative interactions. 3. Generativity and complexity. 4. Older adults must keep physically active and mentally active in order to keep their bodies and brains healthy. 5. Technology is helping us stay healthier and live longer, and changing social norms are changing the Western perception of aging.

Critical Thinking Applied: The Mozart Effect

Imagine this: You have just had your first child, and now you are the proud parent of what you are sure is the most amazing baby ever born (we aren't making fun of you—we all feel that way about our kids!). Like many parents, you want to offer your child every opportunity you can to help him (or her) reach full potential. So what would you do if you heard that listening to Mozart would make your baby smarter? In 1993, this provocative finding was announced by a pair of scientific researchers who, indeed, found that listening to Mozart boosted IQ scores (Rauscher et al., 1993). The report received widespread media coverage and gave birth to a host of innovations. Governors in at least two states instituted requirements to provide a Mozart CD to every newborn; websites sprung up that sold all things musical with promises of transforming the listener's “health, education, and well-being” (www.themozarteffect.com); and expectant mothers began to play Mozart to their unborn

children via headphones on their tummies. Before jumping on the bandwagon, though, it might be wise to apply some critical thinking to this remarkable claim.

What Are the Issues?

Could listening to Mozart really improve IQ? If the study appears valid, how does the new finding fit in with other established findings about effects of music and about boosting intelligence? Would other types of music—classical or otherwise—have similar effects? And finally, if listening to a certain type of music really does boost IQ, can we be sure it is the music itself boosting the IQ, or could it be something else about the experience of listening to music that was driving the IQ gain? These are just a few of the questions that a good critical thinker might ask when first hearing this remarkable claim.

What Critical Thinking Questions Should We Ask?

Now that we've identified some of the issues this claim raises, let's apply our critical thinking guidelines to see which ones might help us resolve the issues.

The first thing that might come to mind for you is the extreme nature of this assertion: The original study reported that IQ scores increased by 8 to 9 points after listening to just 10 minutes of Mozart! Is there extraordinary evidence to support this *extraordinary claim*? An inspection of the *source* reveals that the claimants are researchers at a respected university, which lends initial credibility to their assertion. What, then, is the nature of the *evidence*? First, the finding was indeed based on an empirical study, rather than anecdotal evidence, so it passes that test. A second element of the evidence to examine is the sample: Who were the participants, and how well do they represent the population at large? In this case, participants were college students, which might give you pause. But would the findings necessarily apply to babies? Or could the effect be limited to people already at a certain level of cognitive development?

Another critical thinking question to ask concerns the reasoning: Does it avoid *common fallacies*? One common fallacy is the correlation–causation issue. In this study, researchers used an experimental design with random assignment to groups, so the findings do appear causal rather than correlational in nature. Even when the findings of a study are valid, though, another common fallacy can occur when the findings are interpreted in a manner that oversimplifies or exaggerates the meaning of the findings. In this case, is it reasonable to conclude from the findings of this study that listening to Mozart boosts IQ? (Here's where it gets really interesting!) A closer look at the findings reveals that the IQ gain found in the study was only temporary and disappeared after about 15 minutes. And, second, the measure used to assess IQ (which by definition is a global measure) was actually a test of visual–spatial competence (which is just one specific element of IQ tests). To say that Mozart boosts intelligence is clearly an exaggeration of the actual findings.

What Conclusions Can We Draw?

In the years following the original study over 20 similar studies have been conducted and published in recognized scientific journals. While a few found evidence of what has become popularly known as “the Mozart effect,” most did not (Steele et al., 1999). In fact, in-

depth studies of the process reveal that the short-term boost in IQ score is more accurately a result of a slight increase in positive mood that most participants report when listening to the particular Mozart composition used in many of the studies: When mood was measured before and after listening to the music and statistically removed from the equation, the temporary IQ increase disappeared (Thompson et al., 2001). What's more, other mildly positive experiences, such as listening to a story rather than sitting in silence for 10 minutes, produce the same increase in mood and subsequently the same temporary IQ gain (Nantais & Schellenberg, 1999).

A more reasonable conclusion of these studies is that experiences that increase positive mood facilitate better visual–spatial reasoning while the mood remains elevated. This finding, contrary to the “Mozart effect” claim, is corroborated by other psychological research. Some studies, for example, have uncovered a relationship between positive mood and performance on cognitive tasks (Ashby et al., 1999; Kenealy, 1997). And listening to music that promotes happiness has been found to increase speed and productivity on a variety of tasks.

To be fair, it wasn't the original research report that exaggerated the findings or implied that they would apply to babies, but the media reports that proliferated in the wake of the research. Stanford University professor Chip Heath thinks he knows why: His analysis reveals that the original 1993 article received far more attention in newspaper stories than any other research report published around that time, and the greatest coverage in states with the lowest student test scores. “Problems attract solutions,” says Heath, and Americans as a culture seem more obsessed with early childhood education than many other cultures worldwide (Krakovsky, 2005).

The anxiety noted by Heath, as we learned in Chapter 1, can breed emotional bias, which in turn can influence people to latch on to solutions that seem simple and promise grand results. Add to that findings from memory research indicating that each time a story is told by one person to another, details become distorted—and can you imagine how many people read a newspaper article (which likely distorted the original finding), then told a friend, who told another friend, and so on? It's no wonder the myth of the Mozart effect took such strong hold in our culture. And finally, the confirmation bias helps us understand why people still persist in believing the Mozart effect to be true, despite research reports and newspaper articles that have debunked it.

Chapter Summary

6.1 What Innate Abilities Does the Infant Possess?

Core Concept 6.1: Newborns have innate abilities for finding nourishment, avoiding harmful situations, and interacting with others—all of which are genetically designed to facilitate survival.

From the moment of conception, genetics and the environment interact to influence early development. During the nine-month **prenatal period**, the fertilized egg (**zygote**) becomes an **embryo** and then a **fetus**. **Teratogens** are harmful substances taken in by the mother that can cause damage to the developing fetus. Development of sensory abilities and basic reflexes begins in the prenatal period, and at birth newborns prefer sweet tastes and familiar sounds and have visual abilities ideally suited for looking at faces. **Innate reflexes** such as grasping and sucking help them survive and thrive, as does their ability for **mimicry**. The newborn brain contains some 100 billion neurons.

Infancy spans the first 18 months of life. **Maturation** refers to the genetically programmed events and timeline of normal development, such as crawling before walking and babbling before language development. And while exposure to a rich variety of stimuli in the environment promotes optimal brain development and can speed up the “average” pace of development, the **genetic leash** limits the degree to which the environment plays a role.

Infants need human contact to survive and thrive, and their innate sensory abilities, reflexes, and mimicry promote development of social relationships. During infancy, they establish a close emotional relationship with their primary caregiver that lays the foundation

for the way they perceive and interact in close relationships later in their lives. This attachment style is either secure, anxious-ambivalent, or avoidant, and it is influenced by both the child’s temperament and the responsiveness and accessibility of the primary caregiver. Erikson referred to this first stage of social development as **trust** versus mistrust. Cultural practices and preferences regarding attachment style vary, illustrating the role of the environment in development.

Adoption study (p. 232)	Maturation (p. 236)
Anxious-ambivalent (p. 240)	Mimicry (p. 235)
Attachment (p. 238)	Nature–nurture issue (p. 231)
Avoidant attachment (p. 240)	Neonatal period (p. 234)
Contact comfort (p. 238)	Placenta (p. 233)
Developmental psychology (p. 231)	Prenatal period (p. 232)
Embryo (p. 233)	Secure attachment (p. 240)
Fetal alcohol syndrome (FAS) (p. 233)	Sensitive period (p. 236)
Fetus (p. 233)	Separation anxiety (p. 240)
Genetic leash (p. 236)	Synaptic pruning (p. 236)
Imprinting (p. 238)	Synchronicity (p. 235)
Infancy (p. 235)	Teratogen (p. 233)
Innate ability (p. 232)	Trust (p. 242)
Innate reflex (p. 235)	Twin study (p. 231)
	Zygote (p. 232)

MyPsychLab Resources 6.1:

- Watch:** Fetal Development
- Watch:** The Newborn’s Reflexes
- Watch:** Attachment to Infants

6.2 What Are the Developmental Tasks of Childhood?

Core Concept 6.2: Nature and nurture work together to help children master important developmental tasks, especially in the areas of language acquisition, cognitive development, and development of social relationships.

The rapid development of language ability is one of the most amazing developmental feats of early childhood.

There is widespread agreement that we are born with innate mental structures that facilitate language development, which Chomsky called **language acquisition devices (LADs)**. While all normally developing infants will acquire language on a relatively predictable timeline—as long as they are exposed to language in their environment—the specific language that they develop depends on the language(s) to which they are exposed and can be verbal or sign language. Frequency of exposure can also modify the pace of language development.

Babbling begins about 4 months of age, and is the first step toward language development. **Grammar**, **telegraphic speech**, and use of **morphemes** follow in just a few years.

Cognitive development refers to the emergence of mental abilities such as thinking, perceiving, and remembering. Jean Piaget proposed the most influential model of cognitive development, which suggests that children progress through four distinct stages, each of which is characterized by identifiable changes in mental abilities. Throughout the stages, **schemas** form the mental frameworks for our understanding of concepts, and these schemas are modified by assimilation and accommodation as we acquire new information. The **sensorimotor stage** is characterized by the emergence of goal-directed behavior and object permanence, while the subsequent **preoperational stage** is marked by egocentrism, animistic thinking, centration, and irreversibility. Progression beyond the limitations of the preoperational stage marks the beginning of the **concrete operations stage**, during which children master conservation. Piaget's fourth stage doesn't begin until adolescence. Although many of Piaget's observations have withstood the test of time, in general today's researchers note that children progress more rapidly and less abruptly through the stages than Piaget believed.

The third developmental task of childhood is development of social relationships. Our basic temperament, present at birth, plays a strong role in our socioemotional development; but, like most other abilities, it can be modified by support or challenges in our environment. **Socialization** refers to the process by which children learn the social rules and norms of their culture, and parenting style plays a significant role in socialization. Overall, the best child outcomes typically result from an **authoritative** parenting style. The influence of day care on development depends entirely on the quality of day care rather than the amount of time spent in day care. The influence of leisure activities, such as television and video games, depends on both the time spent in the activity as well as the type of program or game being viewed or played.

Erikson observed three major developmental stages during childhood. **Autonomy** can be encouraged by an optimal balance of freedom and support. **Initiative**, the goal of the third stage, is marked by increased choices and self-directed behavior. **Industry** can develop in the elementary school years when children are encouraged to develop their skills and abilities and learn to respond effectively to both successes and failures. Optimal development at each stage increases the chances for mastery of each successive stage.

Accommodation (p. 247)	Language acquisition device (LAD) (p. 244)
Animistic thinking (p. 249)	Mental operation (p. 250)
Assimilation (p. 247)	Mental representation (p. 248)
Attention-deficit hyperactivity disorder (ADHD) (p. 257)	Morpheme (p. 246)
Authoritarian parent (p. 253)	Object permanence (p. 248)
Authoritative parent (p. 253)	Permissive parent (p. 253)
Autonomy (p. 256)	Preoperational stage (p. 248)
Babbling (p. 245)	Psychosocial stage (p. 256)
Centration (p. 249)	Schema (p. 247)
Cognitive development (p. 246)	Sensorimotor intelligence (p. 248)
Concrete operational stage (p. 250)	Sensorimotor stage (p. 248)
Conservation (p. 250)	Socialization (p. 253)
Egocentrism (p. 249)	Stage theory (p. 247)
Goal-directed behavior (p. 248)	Telegraphic speech (p. 245)
Grammar (p. 245)	Temperament (p. 252)
Industry (p. 257)	Theory of mind (p. 251)
Initiative (p. 257)	Uninvolved parent (p. 253)
Irreversibility (p. 249)	Wave metaphor (p. 252)

MyPsychLab Resources 6.2:

Explore: Piaget's Stages of Cognitive Development

Watch: Conservation of Liquids

Watch: Early Gender Typing

6.3 What Changes Mark the Transition of Adolescence?

Core Concept 6.3: Adolescence offers new developmental challenges growing out of physical changes, cognitive changes, and socioemotional pressures.

Physically, **adolescence** begin with the onset of **puberty**, marked by the production of live sperm in males and the onset of menstruation in females. Psychologically, the meaning of adolescence varies culturally, as does the

time at which adolescence is thought to end. In Western culture, the physical changes brought on by puberty often promote greater attention to physical appearance, which in some Western cultures is linked to self-esteem. Sexuality and **sexual orientation** begin to develop during adolescence, with almost half of North American teens having their first sexual experience by age 17.

Cognitively, adolescence is characterized by Piaget's **formal operational stage**, during which increasing ability for abstract thought develops—if cultural educa-

tional norms support abstract thought. Moral thinking may also progress to higher levels. Risk-taking increases during adolescence for Western teens, and although hormonal surges sometimes increase emotionality, most teens do not experience adolescence as a time of turmoil. While the influence of peers takes on greater importance than in the childhood years, a stable relationship with parents is a crucial factor in the successful transition through adolescence. The primary developmental task of this period, according to Erikson, is the development of a unique **identity**.

Adolescence (p. 260)

Formal operational stage
(p. 263)

Identity (p. 266)

Menarche (p. 261)

Puberty (p. 261)

Rite of passage (p. 260)

Sexual orientation (p. 262)

Stage of moral reasoning
(p. 265)

MyPsychLab Resources 6.3:

Watch: Adolescent Sexuality: Deborah L. Tolman

Watch: Friends

6.4 What Developmental Challenges Do Adults Face?

Core Concept 6.4: Nature and nurture continue to interact as we progress through a series of transitions in adulthood, and cultural norms about age combine with new technology to increase both the length and quality of life for many adults.

Adult development is a relatively new field of study and is receiving increased attention by psychologists as more adults live longer and healthier lives. Rather than perceiving adulthood as a series of concrete and well-defined stages, research indicates that well-developed adults progress through a series of transitions throughout adulthood, each of which is marked by reflection on past years and growth into new directions.

According to Erikson, the major developmental task of *early adulthood* is the development of **intimacy**, characterized by a long-term commitment to an intimate partner. In previous generations, Westerners expected this to occur in a person's 20s, but in industrialized societies today a transition period called **emerging adulthood** may precede intimacy and early adulthood. After the exploration and experimentation of emerging adulthood, most adults marry. Successful intimate relationships rely on effective communication and conflict resolution and on a 5:1 ratio of positive to negative interactions.

Contrary to popular belief, research indicates that midlife is a peak period of development in many respects. Middle adults' ability to integrate a variety

of complex thinking skills facilitates a complex life that includes work, relationships, and healthy coping with stressful life events. Erikson saw the main developmental task of **middle adulthood** as **generativity**, which involves contributing to the next generation. Midlife crises are not experienced by most midlife adults, although those who have not resolved earlier developmental tasks successfully are more at-risk for a midlife crisis.

Late adulthood, according to Erikson, is best navigated by the achievement of **ego-integrity**, or the ability to accept both the successes and failures of one's past and present. While our sensory abilities do typically decline in late adulthood, both cognitive and physical decline can—to some extent—be slowed significantly by regular physical and mental exercise. Moreover, some abilities, such as vocabulary and social skills, actually improve with age. Cultural norms also have an impact on aging and foster expectations of positive or negative changes along with it. Remaining active and engaged on all levels—physically, intellectually, and socially—is the most important key to healthy aging.

Alzheimer's disease (p. 275)

Ego-integrity (p. 274)

Emerging adulthood (p. 270)

Generativity (p. 272)

Intimacy (p. 269)

Peer marriage (p. 271)

Revolution in aging (p. 269)

Selective social interaction
(p. 276)

Transition (p. 272)

Discovering Psychology Viewing Guide



Watch the following videos by logging into MyPsychLab (www.mypsychlab.com). After you have watched the videos, complete the activities that follow.



PROGRAM 5: THE DEVELOPING CHILD



PROGRAM 6: LANGUAGE DEVELOPMENT



PROGRAM 17: SEX AND GENDER



PROGRAM 18: MATURING AND AGING

PROGRAM REVIEW

- What task of infancy is aided by a baby's ability to recognize his or her mother's voice?
 - avoiding danger
 - seeking sustenance
 - forming social relationships
 - learning to speak
- Jean Piaget has studied how children think. According to Piaget, at what age does a child typically master the idea that the amount of a liquid remains the same when it is poured from one container to another container with a different shape?

a. 2 years old	c. 6 years old
b. 4 years old	d. 8 years old
- A baby is shown an orange ball a dozen times in a row. How would you predict the baby would respond?
 - The baby will make the same interested response each time.
 - The baby will respond with less and less interest each time.
 - The baby will respond with more and more interest each time.
 - The baby will not be interested at any time.
- Which of the following do newborns appear not to already be equipped with?
 - a temperament
 - a preference for novelty
 - a preference for complexity
 - the ability to understand reversibility in conservation
- The Wild Boy of Aveyron represents which important issue in developmental psychology?
 - ethics in experimentation
 - the relation of physical development to social development
 - nature versus nurture
 - interpretation of experimental data
- At 1 month of age, babies
 - are best described as "a blooming, buzzing confusion."
 - prefer stimuli that are constant and don't vary.
 - have not yet opened their eyes.
 - prefer human faces over other visual stimuli.
- Which of the following is last to emerge in children?
 - fear of heights
 - preference for mother's voice over other people's voices
 - temperament
 - ability to see analogies between a real situation and a scale model of it
- Which of the following psychological characteristics appear(s) to have a genetic component?
 - activity level
 - tendency to be outgoing
 - risk for some psychopathologies
 - all of the above
- What sounds do very young babies prefer?

a. ocean sounds	c. other babies
b. human voices	d. soft music

10. How does the development of language competence compare from culture to culture?
 - a. It varies greatly.
 - b. It is remarkably similar.
 - c. Western cultures are similar to each other, whereas Eastern cultures are very different.
 - d. This topic is just beginning to be explored by researchers.
11. Which of the following stages of communication consist of simple sentences that lack plurals, articles, and tenses, but tend to have the constituent words in the order appropriate to the child's native language?
 - a. telegraphic speech
 - b. babbling
 - c. question-asking
 - d. ritualistic speech
12. What is the correct progression in the development of communication?
 - a. babbling, cooing, crying, two-word phase
 - b. crying, babbling, cooing, two-word phase
 - c. crying, cooing, babbling, two-word phase
 - d. cooing, crying, babbling, two-word phase
13. According to research by Zella Lurin and Jeffrey Rubin, the difference in the language parents use to describe their newborn sons or daughters is primarily a reflection of
 - a. actual physical differences in the newborns.
 - b. differences in the way the newborns behave.
 - c. the way the hospital staff responds to the babies.
 - d. the parents' expectations coloring their perceptions.
14. Which difference between the ways in which boys and girls play seems linked to sex hormones?
 - a. Girls play with dolls.
 - b. Boys engage in rough and tumble play.
 - c. Boys play in larger groups than girls do.
 - d. Girls build rooms, and boys build towers.
15. The term *androgynous* would best apply to which of the following people?
 - a. a macho man who participates in body-building competitions
 - b. a dainty woman who belongs to a sewing club
 - c. a young boy who never talks in class because he feels shy
 - d. a male rock star who wears heavy makeup, long hair, and feminine clothing
16. Because of the way we socialize our children, men tend to experience more freedom to _____, whereas women tend to experience more freedom to _____.
 - a. explore; criticize
 - b. withdraw; invent
 - c. discover; express themselves
 - d. express themselves; explore
17. How has research on lifespan development changed our idea of human nature?
 - a. We see development as a growth process of early life.
 - b. We see that a longer lifespan creates problems for society.
 - c. We view people as continuing to develop throughout life.
 - d. We regard development as a hormonally based process.
18. According to Erikson, the young adult faces a conflict between
 - a. isolation and intimacy.
 - b. heterosexuality and homosexuality.
 - c. autonomy and shame.
 - d. wholeness and futility.
19. Assuming that a person remains healthy, what happens to the ability to derive sexual pleasure as one ages?
 - a. It does not change.
 - b. It gradually diminishes.
 - c. It abruptly ceases.
 - d. It depends on the availability of a suitable partner.
20. In which of the following areas do the elderly typically have an advantage over college students?
 - a. The elderly are better able to climb stairs.
 - b. The elderly generally have higher short-term memory capacity.
 - c. The elderly are less lonely.
 - d. The elderly have a more developed sense of humor.

QUESTIONS TO CONSIDER

1. How might the knowledge of developmental norms affect a parent's response to a child? How might advanced techniques to detect prenatal perception and cognition inform parents? Speculate on what would happen if parents raised their children following inaccurate or out-of-date theories of child development.
2. Can some of the measures used to determine the cognitive capabilities of preverbal infants be applied to nonhuman animals? What would we be able to conclude from patterns of results that are similar to or different from those found in human infants?
3. How closely tied are language and thought? Is language ability necessary for thought?
4. If you tried to raise a child without exposing him or her to any gender-typing biases, how extensively would you need to change the social and physical environments that the child would normally encounter? How big of a job would this be? Could you ultimately be successful?

5. How do social conditions help create the characteristics of adolescence and adulthood in the human life cycle?

ACTIVITIES

1. Compare yourself to your siblings. What traits, abilities, and interests do you share? Speculate on the roles of genetics and environment in the development of your similarities and differences.
2. Make a list of the labels used to describe people at various stages of life from infancy to old age.

Which age group has the most labels? Compare the synonyms and modifiers for childhood to the words that help define adulthood. What might explain the difference?

3. Interview an elderly person to find out what his or her experiences have been of the costs and benefits, both cognitively and socially, of aging in this country. Does the elder ever find that he or she is discriminated against? Does the elder find that people are more generous with him or her than with other people?