Human Development

In 1987 Hulda Crooks climbed Mount Whitney in the Sierra Nevada Mountains of California for the 23rd time. This would be a noteworthy feat for any person, given that at 14,495 feet, Mount Whitney is the tallest mountain in the contiguous 48 states. What made it more impressive was that Hulda was 91 years old at the time, making her the oldest person ever to reach the summit. That year she also became the oldest woman to climb Mount Fuji, the tallest mountain in Japan. The Japanese sponsors of her ascent honored her with a banner reading "Grandma Fuji."

The following year Hulda decided to add the U.S. Capitol to her long list of conquests. She barely worked up a sweat as she ascended the 350-step staircase in the building's dome in just 30 minutes. Hulda, a physical fitness proponent who also held eight Senior Olympics world records in track and field at the time, made the climb to celebrate National Women in Sports Day (Connors, 1988).

In 1991 a peak near Mount Whitney was named Crooks Peak in Hulda's honor. "You have not only highlighted the importance of physical fitness for all Americans, but also served as a role model for senior citizens everywhere," wrote President George H. W. Bush in a letter recognizing her accomplishments. At the ceremony naming the peak, Hulda observed, "It's never too late to change your lifestyle if you realize it's not appropriate. I want to impress to young people that they're building their old age now" (Kuebelbeck, 1991).

Hulda, who died in 1997 at the age of 101, was a vegetarian who took up hiking in her 40s following a bout with pneumonia. She did not scale her first peak until she was 66, when many people are content to lead a more sedentary life. Hulda advocated a sparse diet, vigorous exercise, and avoiding caffeine and alcohol. She also credited her healthy life to her spirituality as a devout member of the Seventh Day Adventist Church. Hulda published her memoirs, *Conquering Life's Mountains*, as a testament to the importance of mental, physical, and spiritual well-being. At a book signing, she was treated as a celebrity. Mountaineers lined up to have her sign their copies. One of them laughed when he realized that he had retired from mountain climbing at 55, when he was more than 10 years younger than Hulda was when she began her climbing career (Fieckenstein, 1996).

Hulda Crooks' accomplishments in old age contradict the stereotype of the elderly as frail and lacking in vitality. Psychologists who study the aging process find that severe mental and physical decline is not
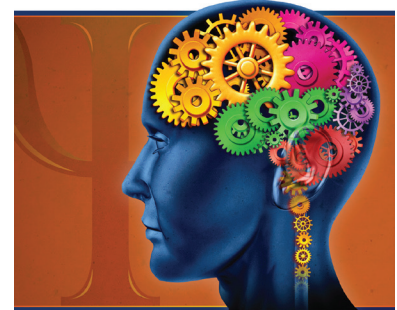
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Chapter Outline

Research Methods in Developmental Psychology

Prenatal Development

Infant and Child Development

Adolescent Development

Adult Development

necessarily a characteristic of old age. As Hulda noted, by keeping mentally and physically active in adulthood we can have rich, rewarding lives throughout our later years. **Developmental psychology** is the study of the physical, perceptual, cognitive, and psychosocial changes that take place across the life span. Though opinions about the nature of human development can be found in the writings of ancient Greek philosophers, the scientific study of human development did not begin until the 1870s. That decade saw the appearance of the "baby biography," usually written by a parent, which described the development of an infant. Though much of infant development depends on learning, it also is guided by physical **maturation**—the sequential unfolding of inherited predispositions (as in the progression from crawling to standing to walking). Developmental psychologists recognize that most aspects of human development depend on the interaction of genetic and environmental factors (Belsky & Pluess, 2009). The 1890s saw the beginning of research on child development after infancy (White, 1990), most notably at Clark University by G. Stanley Hall (1844–1924). Hall based his views on Darwin's theory of evolution, earning him the title of "the Darwin of the mind." He applied research findings to the improvement of education and child rearing, and today he is recognized as the founder of *child psychology*. Until the 1950s the study of human development was virtually synonymous with child psychology. During that decade, psychologists began to study human development across the life span. More recently, psychologists have come to realize the importance of considering social-cultural factors in human development.

developmental psychology The field that studies physical, perceptual, cognitive, and psychosocial changes across the life span.

maturation The sequential unfolding of inherited predispositions in physical and motor development.

Research Methods in Developmental Psychology

Though developmental psychologists often use the same research methods as other psychologists, they also rely on methods that are unique to developmental psychology. These include *longitudinal research*, *cross-sectional research*, and *cohort-sequential research*, which enable researchers to study age-related differences and changes in their participants.

Longitudinal Research

longitudinal research A research design in which the same group of participants is tested or observed repeatedly over a period of time.

Longitudinal research follows the same participants over a period of time, typically ranging from months to years. The researcher looks for changes in particular characteristics, such as language, personality, intelligence, or perceptual ability. Suppose you wanted to study changes in the social maturity of college students. If you chose to use a longitudinal design, you might assess the social maturity of an incoming class of first-year students and then note changes in their social maturity across their 4 years in college. Longitudinal research has been used to study numerous topics, such as factors associated with the development of creativity in children and adolescents (Weller, 2012), the relationship between identity, intimacy, and well-being in midlife (Sneed, Whitbourne, Schwartz, & Huang, 2012), and older adults' evaluations of their physical health as they age (Sargent-Cox, Anstey, & Luszcz, 2010).

Though longitudinal research has the advantage of permitting us to study individuals as they change across their life spans, it has major weaknesses. First, the typical longitudinal study takes months, years, or even decades to complete. This often requires ongoing financial support and continued commitment by researchers—neither of which can be guaranteed. Second, the longer the study lasts, the more likely it is that participants will drop out. They might refuse to continue or move away or even die. If those who drop out differ in

important ways from those who remain, the results of the research might be less generalizable to the population of interest (Feng, Silverstein, Giarrusso, McArdle, & Bengtson, 2006). For example, a 14-year longitudinal study of changes in adult intelligence found that those who dropped out had scored lower on intelligence tests than did those who remained. This made it unwise to generalize the study's findings to all adults. Including only those who remained in the study would have led to the erroneous conclusion that as adults age they show a marked increase in intelligence (Schaie, Labouvie, & Barrett, 1973).

Cross-Sectional Research

The weaknesses of longitudinal research are overcome by **cross-sectional research**, which compares groups of participants of different ages at the same time. Each of the age groups is called a **cohort**. If you chose to use a cross-sectional design to study age-related differences in social maturity of college students, you might compare the current social maturity of four cohorts: first-year students, sophomores, juniors, and seniors. A cross-sectional research design was used in a study of differences in male sexuality across adulthood. The researchers compared samples of men in their 30s through 90s. The stereotypical view of old age as a time of asexuality was countered by the finding that all of the participants in the oldest groups reported feelings of sexual desire (Mulligan & Moss, 1991). Cross-sectional research designs have been used to study topics as varied as differences in attitudes about love, sex, and "hooking up" among students during their first year of college (Katz & Schneider, 2013) and the relationship between medical education and differences in moral reasoning across four years of medical school (Self & Baldwin, 1998).

Like longitudinal research, cross-sectional research has its own weaknesses. The main one is that cross-sectional research can produce misleading findings if a cohort in the study is affected by circumstances unique to that cohort (Fullerton & Dixon, 2010). Thus, cross-sectional studies can identify differences between cohorts of different ages, but those differences might not hold true if cohorts of those ages were observed during another era. Suppose that you conduct a cross-sectional study and find that older adults are more prejudiced against minorities than are younger adults. Does this mean that we become more prejudiced with age? Not necessarily. Perhaps, instead, the cohort of older adults was reared at a time when prejudice was more acceptable than it is today. Members of the cohort might simply have retained attitudes that they developed in their youth.

Cohort-Sequential Research

One way to deal with the shortcomings of longitudinal and cross-sectional research is to use **cohort-sequential research**, which begins as a cross-sectional study by comparing different cohorts and then follows the cohorts longitudinally. As an example, consider how a cohort-sequential research design was employed in a study of alcohol use in old age. Healthy cohorts ranging in age from 60 to 86 years were first compared cross-sectionally. The results showed a decline in the percentage of drinkers with age. The cohorts then were followed longitudinally for 7 years. The results remained the same: as the drinkers aged, they drank less. This made it more likely that the decline in drinking with age was related to age rather than to life experiences peculiar to particular cohorts (Adams, Garry, Rhyne, & Hunt, 1990). Another cohort-sequential study found that participation in sports, athletics, or exercising was related to lower levels of substance abuse by teenagers and young adults rather than merely being associated with different patterns of substance abuse for different age cohorts (Terry-McElrath & O'Malley, 2011).

Cohort-sequential research designs also may reveal age differences that are cohort effects rather than being age-related effects. This was the case in the Seattle Longitudinal Study. Cognitive abilities of participants in the longitudinal aspect of the study were measured in 1956, 1963, 1970, and 1977. At each of those times, the cognitive abilities of participants of different ages were compared cross-sectionally. The findings showed that there was a larger cognitive decline in the cross-sectional comparisons than in the longitudinal comparisons. This indicates that observed differences in cognitive ability at

cross-sectional research A research design in which groups of participants of different ages are compared at the same point in time.

cohort A group of people of the same age group.

cohort-sequential research A research design that begins as a cross-sectional study by comparing different cohorts and then follows the cohorts longitudinally.

different ages is more related to factors affecting particular cohorts than to changes that naturally accompany aging (Williams & Klug, 1996).

Longitudinal research, cross-sectional research, and cohort-sequential research have long been staples of research on development from birth to death. Today, technology permits developmental psychologists to study ongoing developmental processes even before birth, during the prenatal period.
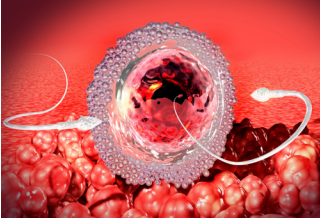
The Germinal Stage

The germinal stage begins with conception, when one sperm penetrates the outer layer of the egg in a fallopian tube. Once this occurs, cells divide until a multi-cell clump, called a blastocyst, which continues on its journey to the uterus.

Source: Ralwel/Shutterstock.com.

germinal stage The prenatal period that lasts from conception through the second week.

embryonic stage The prenatal period that lasts from the end of the second week through the tenth week.

Section Review: Research Methods in Developmental Psychology

1. What is maturation?

2. What are the strengths and weaknesses of cross-sectional and longitudinal research designs?

Prenatal Development

All of us began life as a single cell. The formation of that cell begins the prenatal period, which lasts about 9 months and is divided into the germinal stage, the embryonic stage, and the fetal stage.
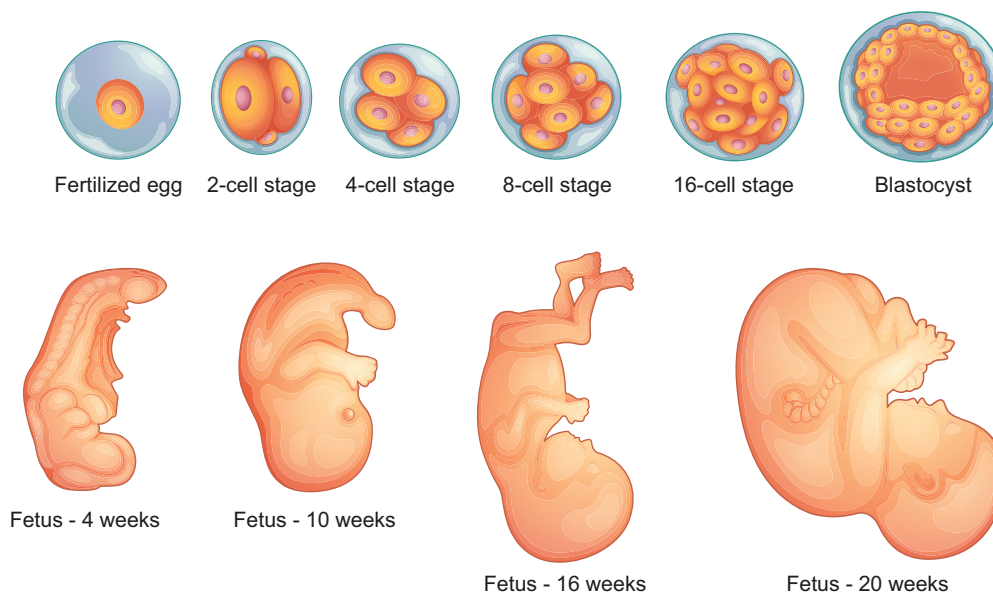
The Germinal Stage

The **germinal stage** begins with conception, which occurs when a *sperm* from the man unites with an egg (or *ovum*) from the woman, usually in one of her two *fallopian tubes*, forming a one-celled *zygote*. The zygote contains 23 pairs of chromosomes, one member of each pair coming from the ovum and the other coming from the sperm. The chromosomes, in turn, contain genes that govern the development of the individual. The zygote begins a trip down the fallopian tube, during which it is transformed into a larger, multicelled ball, called a *blastocyst*, by repeated cell divisions. By the end of the second week, the blastocyst attaches to the wall of the uterus. This marks the beginning of the embryonic stage.

The Embryonic Stage

The **embryonic stage** lasts from approximately the end of the second week through approximately the tenth week of prenatal development. The embryo, nourished by nutrients that cross the placenta, increases in size and begins to develop specialized organs, including the eyes, heart, and brain. What accounts for this rapid, complex process? The development and location of bodily organs is regulated by genes, which determine the kinds of cells that will develop and also control the actions of *cell-adhesion molecules*. These molecules direct the movement of cells and determine which cells will adhere to one another, thereby determining the size, shape, and location of organs in the embryo (Rungger-Brändle, Ripperger, Steiger, Soltanieh, & Rungger, 2010). By the end of the embryonic stage, development has progressed to the point at which the heart is beating and the approximately one-inch-long embryo has facial features, limbs, fingers, and toes.

But what determines whether an embryo becomes a female or a male? The answer lies in the 23rd pair of chromosomes, the sex chromosomes, which are designated *X* or *Y*. Embryos that inherit two X chromosomes are genetic females, and embryos that inherit one X and one Y chromosome are genetic males. The presence of a Y chromosome directs the development of the testes; in the *absence* of a Y chromosome, the ovaries differentiate. Near the end of the embryonic period, the primitive gonads of male embryos secrete the hormone *testosterone*, which stimulates the development of male sexual organs. And the primitive gonads of female embryos secrete the hormones *estrogen* and *progesterone*,

Human Embryonic and Fetal Development

Fertilized egg 2-cell stage 4-cell stage 8-cell stage 16-cell stage Blastocyst

Fetus - 4 weeks Fetus - 10 weeks Fetus - 16 weeks Fetus - 20 weeks

which stimulate the development of female sexual organs. Thus, the hormonal environments of female and male fetuses differ at the embryonic stage of development.

Prenatal hormones direct the differentiation of sexual organs and the brain, especially the hypothalamus (see Chapter 3). The secretion of testosterone by the male fetus directs the differentiation of the male sexual organs. In cases where testosterone is absent, female sexual organs differentiate. There is evidence, though, that estrogen plays a greater role in sexual differentiation of the female fetus than has been estimated in the past (Collaer, Geffner, Kaufman, Buckingham, & Hines, 2002).

The Fetal Stage

The presence of a distinctly human appearance marks the beginning of the **fetal stage**, which lasts from the beginning of the third prenatal month until birth. By the fourth month, pregnant women report movement by the fetus. And by the seventh month, all of the major organs are functional, which means that an infant born even 2 or 3 months prematurely has a chance of surviving. The final 3 months of prenatal development are associated with most of the increase in the size of the fetus.

The fetus also develops rudimentary sensory and cognitive abilities, including the ability to hear sounds and form long-term memories. In one study, 143 fetuses were exposed to a series of conditions. First, there was 2 minutes of silence. Second, there was a tape recording of their mother reading a story. The recording was played for 2 minutes through a speaker held about 4 inches from the mother's abdomen. Then, they were exposed to another 2 minutes of silence. Fetal heart rate increased in response to the mother's voice and decreased when they were exposed to silence. This indicates that the fetus can perceive and form a memory of its mother's voice (Kisilevsky & Haines, 2011).

Premature infants tend to be smaller and less physically and cognitively mature than full-term infants. For example, when an object approaches the eyes of a premature infant, the infant might not exhibit normal defensive blinking (Pettersen, Yonas, & Fisch, 1980). Moreover, though prenatal development usually produces a healthy infant, in some cases genetic defects produce distinctive physical and psychological syndromes. The chromosomal disorder called Down syndrome (discussed in Chapter 10), for example, is associated with intellectual disabilities and abnormal physical development. Other sources of prenatal defects are **teratogens**, which are noxious substances or other factors that can disrupt prenatal development and prevent the individual from reaching her or

fetal stage The prenatal period that lasts from the end of the eighth week through birth.

teratogen A noxious substance, such as a virus or drug, that can cause prenatal defects.

his inherited potential. (The word *teratogen* was coined from Greek terms meaning "that which produces a monster.")

Most teratogens affect prenatal development by first crossing the placenta. A potent teratogen is the German measles (rubella) virus, which can cause defects of the eyes, ears, and heart—particularly during the first 3 months of prenatal development. Many drugs, both legal and illegal, can cross the placenta and cause abnormal physical and psychological development. These drugs include nicotine (Piper, Gray, & Birkett, 2012) and marijuana (Keegan, Parva, Finnegan, Gersen, & Belden, 2010). And alcohol consumption during pregnancy is associated with **fetal alcohol syndrome**. Fetal alcohol syndrome is associated with facial deformities, intellectual disabilities, attentional deficits, and poor impulse control. Researchers have demonstrated the striking teratogenic effect of alcohol in animal studies. When pregnant rats were given alcohol during the embryo stage, their offspring had physical deformities and behavioral deficits similar to those seen in humans (Sulik, Johnston, & Webb, 1981).

Factors that are correlated with parental substance abuse also may have harmful long-term effects. Recreational drug use has adverse effects on the father's health, including damaged DNA that results in abnormal sperm (Pollard, 2000). Parents with a history of substance abuse also are more likely to have turbulent relationships. One study found that women who were heavy cocaine users were more likely to report that the father of the child abused alcohol or other drugs. And fathers with a history of a drug or alcohol problems were more likely to subject their partner to physical or mental abuse during her pregnancy (Frank, Brown, Johnson, & Cabral, 2002). Sadly, children with a history of prenatal drug exposure also are at risk of receiving poor-quality parental care after birth (Eiden, Schuetze, & Coles, 2011). Thus, teratogens not only have a direct effect upon prenatal development, they also may harm the child indirectly by contributing to an environment that fails to ensure the child's well-being.

fetal alcohol syndrome A disorder, marked by physical defects and intellectual disability, that can afflict the offspring of women who drink alcohol during pregnancy.

Section Review: Prenatal Development

1. What are cell-adhesion molecules?

2. What are the symptoms of fetal alcohol syndrome?

Infant and Child Development

childhood The period that extends from birth until the onset of puberty.

infancy The period that extends from birth through 2 years of age.

Childhood extends from birth until puberty and begins with **infancy**, a period of rapid physical, cognitive, and psychosocial development, extending from birth to age 2 years. Many developmental psychologists devote themselves to studying the changes in physical, perceptual, cognitive, and psychosocial development that occur during childhood.

Physical Development

Newborn infants exhibit reflexes that promote their survival, such as blinking to protect their eyes from an approaching object and rooting (searching) for a nipple when their cheeks are touched. Through maturation and learning, the infant quickly develops motor skills that go beyond mere reflexes. The typical infant is crawling by 6 months and walking by 13 months. Though infant motor development follows a consistent sequence, the timing of motor milestones varies somewhat from one infant to another. Figure 4-1 depicts the major motor milestones.

Infancy also is a period of rapid brain development, when many connections between brain cells are formed and many others are eliminated. Though some of these changes are governed by maturation, research studies by Marian Diamond and her colleagues over the past few decades have demonstrated that life experiences can affect brain development (Diamond, 1988). One of these studies determined the effect of enriched and impover-
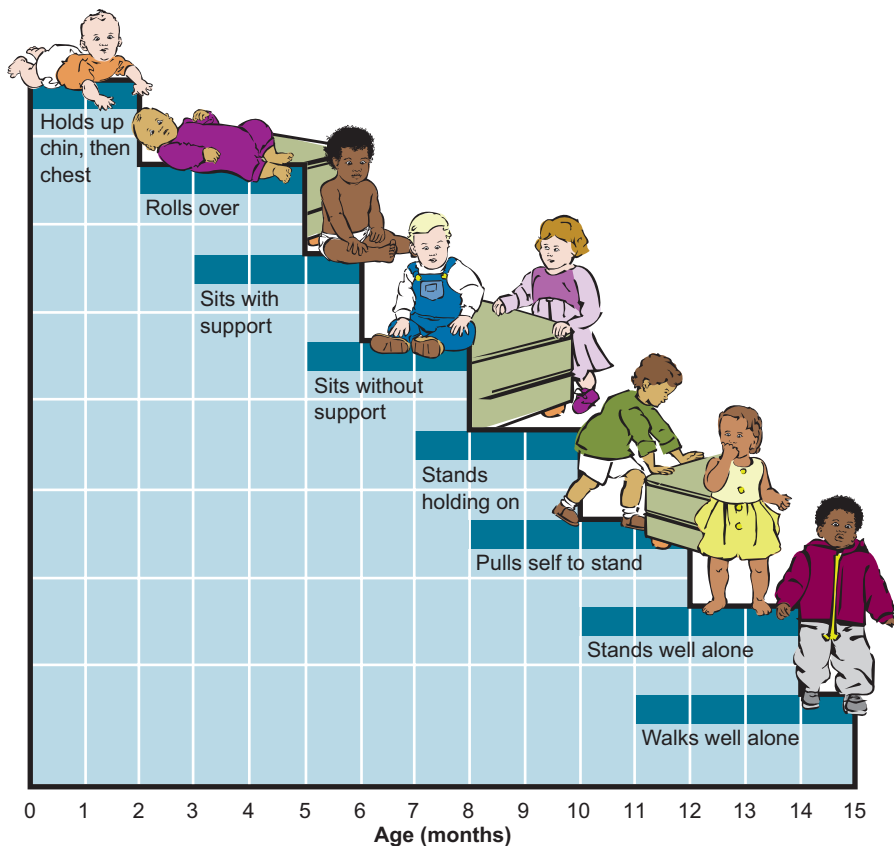
FIGURE 4-1
Motor Milestones

Infancy is a period of rapid motor development. The infant begins with a set of motor reflexes and, over the course of little more than a year, develops the ability to manipulate objects and move independently through the environment. The ages at which healthy children reach motor milestones vary somewhat from child to child, but the sequence of motor milestones does not.

Labels on figure: Holds up chin, then chest; Rolls over; Sits with support; Sits without support; Stands holding on; Pulls self to stand; Stands well alone; Walks well alone. X-axis: Age (months) 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ished environments on the brain development of rats (Camel, Withers, & Greenough, 1986). A group of infant rats spent 30 days in an enriched environment and another group spent 30 days in an impoverished environment. In the enriched environment, the rats were housed together in two large, toy-filled cages, one containing water and one containing food, which were attached to the opposite ends of a maze. The pattern of pathways and dead ends through the maze was changed daily. In the impoverished environment, the rats were housed individually in small, empty cages.

Microscopic examination of the brains of the rats found that those exposed to enriched environments had longer and more numerous dendrites (see Chapter 3) on their brain neurons than did those exposed to the impoverished environment. The increased size and number of dendrites would provide the rats exposed to the enriched environment with more synaptic connections among their brain neurons. The benefits of enriched environments on neural development also have been replicated in studies of children (Bryck & Fisher, 2012).

After infancy, the child's growth rate slows, and most children grow two or three inches a year until puberty. The child's motor coordination also improves. Children gradually learn to perform more sophisticated motor tasks, such as using scissors, tying their shoes, and riding bicycles. The development of motor skills even affects the development of cognitive skills. For example, children's ability to express themselves through language depends on the development of motor abilities that permit them to speak and to write.

Perceptual Development

Over a century ago, in describing what he believed was the chaotic mental world of the newborn infant, William James (1890/1981, Vol. 1, p. 462) claimed, "The baby, assailed by eyes, ears, nose, skin, and entrails at once, feels it all as one great blooming, buzzing confusion." But subsequent research has shown that newborn infants have more highly developed sensory, perceptual, and cognitive abilities than James believed. For example, though newborns cannot focus on distant objects, they can focus on objects less than a

foot away—as though nature has programmed them to focus at the distance of the face of a person who might be holding them (Aslin & Smith, 1988). Newborn infants can use their sense of touch to discriminate between objects with different surface textures (Molina & Jouen, 1998). Newborns also have a more sophisticated sense of smell than James would have presumed. In one study, infants were exposed to either the odor of amniotic fluid (which they experienced while in the womb) or another odor they had not been exposed to before. The results showed that the infants were more likely to turn their heads toward the odor of amniotic fluid than toward the other odor (Schaal, Marlier, & Soussignan, 1998).

Ingenious studies have permitted researchers to infer what infants perceive by recording changes in their eye movements, head movements, body movements, sucking behavior, or physiological responses (such as changes in heart rate or brain-wave patterns). For example, a study of newborn American infants found that they could discriminate between Japanese words with different pitch patterns as indicated by their sucking harder on a rubber nipple in response to particular patterns (Nazzi, Floccia, & Bertoncini, 1998). Infant preferences can be determined by recording which targets they look at longer or by presenting them with a stimulus, waiting for them to *habituate* to it (that is, stop noticing it—as indicated by, for example, a stable heart rate), and then changing the stimulus. If they notice the change, they will show alterations in physiological activity, such as a *decrease* in heart rate.

Studies using these techniques have found that infants have remarkably well-developed sensory-perceptual abilities. Tiffany Field has demonstrated that infants less than 2 days old can imitate sad, happy, and surprised facial expressions (Field, Woodson, Greenberg, & Cohen, 1982). Nonetheless, other studies have been inconsistent in their findings regarding neonatal imitation of facial expressions. The most consistent finding has been that neonates will respond to models who stick out their tongues by sticking out their own (Anisfeld, 1996).

The Research Process box illustrates one of the ways in which psychologists study infant perceptual development. The study made use of a "visual cliff" to test infant depth perception.

Infants also have good auditory abilities, including the ability to localize sounds. Between the ages of 8 and 28 weeks, infants can localize sounds that shift in location by only a few degrees, as indicated by head turns or eye movements in response to the shifts (Morrongiello, Fenwick, & Chance, 1990). Infants can even match the emotional tone of sounds to the emotional tone of facial expressions. In one study, 7-month-old infants were shown a sad face and a happy face. At the same time, they were presented with tones that either increased or decreased in pitch. When presented with a descending tone, they looked longer at a sad face than a happy face, as if they were equating the lower tones with a sad mood and the higher tones with a happy mood (Phillips, Wagner, Fells, & Lynch, 1990). As the preceding studies attest, infants are perceptually more sophisticated than William James presumed.

Cognitive Development

Infancy also is a time of rapid cognitive development, during which infants show the unfolding of inborn abilities and their talent for learning. In regard to inborn abilities, for example, newborn infants can distinguish groups of objects that differ in number (Wynn, 1995). In regard to learning, by 4 or 5 months of age, an infant's response to the sound of its own name differs from its response to hearing other names (Mandel, Jusczyk, & Pisoni, 1995).

Jean Piaget (1896–1980), a Swiss biologist and psychologist, put forth the most influential theory of cognitive development. Piaget (1952) proposed that children pass through four increasingly sophisticated cognitive stages of development (see Table 4-1). According to Piaget, a child is more than an ignorant adult; the child's way of thinking is qualitatively different from the adult's. Moreover, infants are not passive in developing their cognitive views of the physical world. Instead, their views depend on their active interpretation of objects and events in the physical world.

TABLE 4-1 Piaget's States of Cognitive Development

Stage	Age	Description	Developmental Outcome
Sensorimotor	Birth–2 Years	Infants learn to integrate sensory input and motor output and begin to use symbolic thought.	Object permanence
Preoperational	2–7 Years	Children become more sophisticated in their use of language and symbolic thought, but they have difficulty in reasoning logically.	Loss of egocentrism
Concrete operational	7–11 Years	Children become proficient in reasoning logically about concrete situations, such as the ability to make transitive inferences.	Conservation
Formal operational	11–15 Years	Many adolescents learn to use abstract reasoning and to form hypotheses about future events based on relevant current knowledge.	Abstract reasoning and hypothesis testing

Though Piaget assumed that complete passage through one stage is a prerequisite for success in the next one, research suggests that children can achieve characteristics of later stages without completely passing through earlier ones (Berninger, 1988). The issue of whether human cognitive development is continuous (gradual and quantitative) or discontinuous (in stages and qualitative) remains unresolved (Fischer & Silvern, 1985). The stages put forth by Piaget are the *sensorimotor stage*, *preoperational stage*, *concrete operational stage*, and *formal operational stage*. Some psychologists have criticized Piaget's theory for its assumption that cognitive development follows a universal pattern (Elkind, 1996). Cross-cultural research indicates that children throughout the world do tend to pass through these stages in the same order, though the timing varies (Segall, Dasen, Berry, & Poortings, 1990).

Sensorimotor Stage

Piaget called infancy the **sensorimotor stage**, during which the child learns to coordinate sensory experiences and motor behaviors. Infants learn to interact with the world by sucking, grasping, crawling, and walking. In little more than a year, they change from being reflexive and physically immature to being purposeful, locomoting, and language-using. By the age of 9 months, for example, sensorimotor coordination becomes sophisticated enough for the infant to grasp a moving object by aiming her or his reach somewhat ahead of the object—using its speed and direction—instead of where the object appears to be at that moment (Keen, Carrico, Sylvia, & Berthier, 2003).

Piaget claimed that experiences with the environment help the infant form **schemas**, which are cognitive structures incorporating the characteristics of persons, objects, events, procedures, or situations. This means that infants do more than simply gather information about the world. Their experiences actively change the way in which they think about the world. Schemas permit infants to adapt their behaviors to changes in the environment. But what makes schemas persist or change? They do so as the result of the interplay between **assimilation** and **accommodation**. We *assimilate* when we fit information into our existing schemas and *accommodate* when we revise our schemas to fit new information.

Young infants, prior to 6 months old, share an important schema in which they assume that the removal of an object from sight means that the object no longer exists. If an object is hidden by a piece of cloth, for example, the young infant will not look for it, even after watching the object being hidden. To the young infant, out of sight truly means out of mind. As infants gain experience with the coming and going of objects in the environment, they accommodate and develop the schema of **object permanence**—the

sensorimotor stage The Piagetian stage, from birth through the second year, during which the infant learns to coordinate sensory experiences and motor behaviors.

schema A cognitive structure that guides people's perception and information processing that incorporates the characteristics of particular persons, objects, events, procedures, or situations.

assimilation The cognitive process that interprets new information in light of existing schemas.

accommodation 1. The cognitive process that revises existing schemas to incorporate new information. 2. The process by which the lens of the eye increases its curvature to focus light from close objects or decreases its curvature to focus light from more distant objects.

object permanence The realization that objects exist even when they are no longer visible.

When Do Infants Develop Depth Perception?

Rationale

One of the most important perceptual abilities is depth perception. It lets us tell how far away objects are from us, preventing us from bumping into them and providing us with time to escape from potentially dangerous ones. But how early can infants perceive depth? This was the subject of a classic study by Eleanor Gibson (1910–2002) and Richard Walk (Gibson & Walk, 1960).

Method

Gibson and Walk used a "visual cliff" made from a piece of thick, transparent glass set about four feet off the ground (see Figure 4-2). Just under the "shallow" side was a red and white checkerboard pattern. The same pattern was placed at floor level under the "deep" side. The sides were separated by a one-foot-wide wooden board. The participants were 36 infants, aged 6 to 14 months. The infants were placed, one at a time, on the wooden board. The infants' mothers called to them, first from one side and then from the other.

Results and Discussion

When placed on the board, 9 of the infants refused to budge. The other 27 crawled onto the shallow side toward their mothers. But only 3 of the 27 crawled onto the deep side. The remaining ones instead cried or crawled away from it. This indicated that the infants could perceive the depth of the two sides—and feared the deep side. It also demonstrated that depth perception is present by 6 months of age. Replications of the study using a variety of animals found that depth perception develops by the time the animal begins moving about on its own—as early as the first day after birth for chicks and goats. This is adaptive, because it reduces their likelihood of being injured. More recent research on human infants, using decreases in heart rate as a sign that they notice changes in depth, indicates that rudimentary depth perception is present in infants as young as 4 months (Aslin & Smith, 1988). But research findings indicate that human infants will not fear heights until they have had several weeks of crawling experience. Infants will not avoid the deep side of the visual cliff until they have been crawling for at least 12 weeks (Kretch & Adolph, 2013).
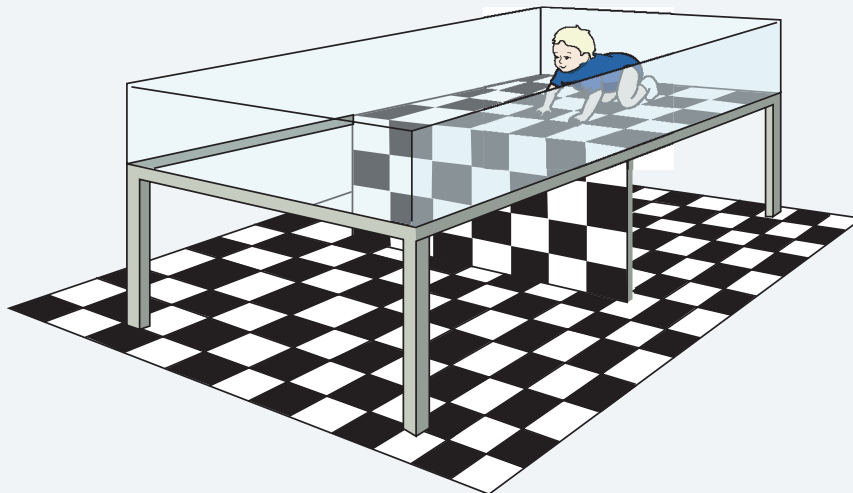

FIGURE 4-2 The Visual Cliff

Eleanor Gibson and Richard Walk (1960) developed the *visual cliff* to test infant depth perception. The visual cliff consists of a thick sheet of glass placed on a table. The shallow end of the visual cliff has a checkerboard surface just below the glass. The deep end of the visual cliff has a checkerboard surface a few feet below the glass. Infants who have reached the crawling stage will crawl from the center of the table across the shallow end, but not across the deep end, to reach their mothers. This finding indicates that by 6 months infants can perceive depth. Of course, this study does not preclude the possibility that infants can perceive depth even before they can crawl.

realization that objects not in view may still exist. Infants generally fail to search for objects that are suddenly hidden from view until they are about 8 months old (Munakata, McClelland, Johnson, & Siegler, 1997). But researchers have questioned Piaget's explanation that young infants fail to search for hidden objects because they lack a schema for object permanence. Perhaps, instead, they simply forget the location of an object that has been hidden from view (Bjork & Cummings, 1984).

After the age of 8 months, most infants demonstrate their appreciation of object permanence by searching at other places for an object they have seen being hidden from view. At this point in their development, they can retain a mental image of a physical object even after it has been removed from their sight, and they realize that the object might be elsewhere. This also signifies the beginning of representational thought—the use of symbols to stand for physical objects. But Piaget might have placed the development of object permanence too late, because infants as young as 6 months have been found to show an appreciation of it (Shinskey, 2012).

Preoperational Stage

According to Piaget, when the child reaches the age of 2 years and leaves infancy, the sensorimotor stage gives way to the **preoperational stage**, which lasts until about age 7. The stage is called preoperational because the child cannot perform what Piaget called *operations*—mental manipulations of reality. For example, before about the age of 5 the early preoperational child cannot perform mental addition or subtraction of objects. During the preoperational stage, however, the child improves in the use of language, including a rapid growth in vocabulary and a more sophisticated use of grammar. Thus mental development sets the stage for language development. Unlike the sensorimotor-stage child, the preoperational-stage child is not limited to thinking about objects that are physically present.

During the preoperational stage, the child also exhibits what Piaget called **egocentrism**, the inability to perceive reality from the perspective of another person. Egocentrism declines between 4 and 6 years of age (Ruffman & Olson, 1989). Children display egocentrism when they draw a picture of their family but fail to include themselves in the drawing. In some capital criminal cases, lawyers might gain a reduced sentence for a child defendant if they can convince the jury that the child had not progressed beyond egocentrism and therefore was unaware of the effect of the criminal act on the victim (Ellison, 1987).

preoperational stage The Piagetian stage, extending from 2 to 7 years of age, during which the child's use of language becomes more sophisticated but the child has difficulty with the logical mental manipulation of information.

egocentrism The inability to perceive reality from the perspective of another person.

Concrete Operational Stage

At about the age of 7, the child enters what Piaget calls the **concrete operational stage**, which lasts until about the age of 11. The child learns to reason logically but is at first limited to reasoning about physical things. For example, when you first learned to do arithmetic problems, you were unable to perform mental calculations. Instead, until perhaps the age of 8, you counted by using your fingers or other objects. An important kind of reasoning ability that develops during this stage is the ability to make **transitive inferences**—the application of previously learned relationships to infer new ones. For example, suppose that a child is told that Pat is taller than Lee, and that Lee is taller than Terry. A child who can make transitive inferences will correctly conclude that Pat is taller than Terry. Though Piaget claimed that the ability to make transitive inferences develops by age 8, research has shown that children as young as 4 can make them—provided they are given age-appropriate tasks (Andrews & Halford, 1998).

By the age of 8, the child in the concrete operational stage also develops what Piaget called **conservation**—the realization that changing the form of a substance or the arrangement of a set of objects does not change the amount. Suppose that a child is shown two balls of clay of equal size. One ball is then rolled out into a snake, and the child is asked if either piece of clay has more clay. The child who has not achieved conservation will probably reply that the snake has more clay because it is longer. Figure 4-3 shows a classic
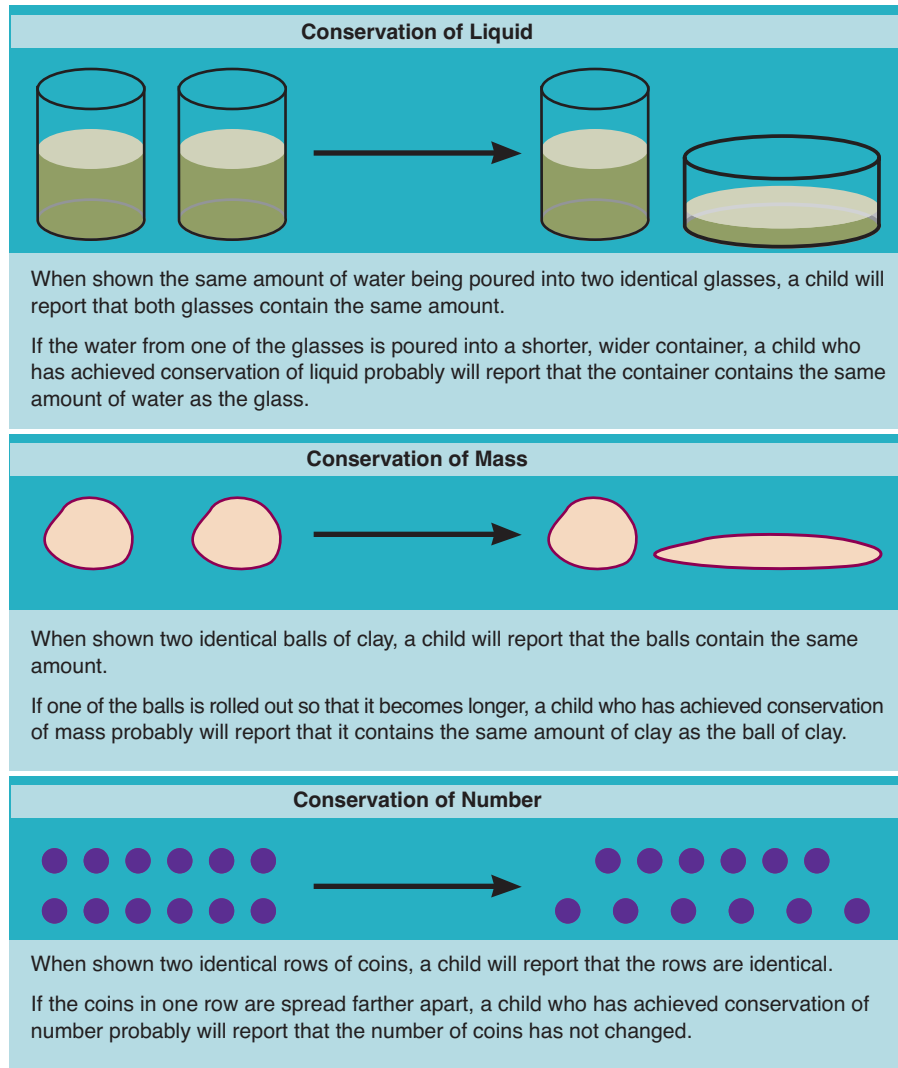
concrete operational stage The Piagetian stage, extending from 7 to 11 years of age, during which the child learns to reason logically about objects that are physically present.

transitive inference The application of previously learned relationships to infer new relationships.

conservation The realization that changing the form of a substance does not change its amount.

FIGURE 4-3
Conservation

During the concrete operational stage, children develop an appreciation of conservation. They come to realize that changing the form of something does not change its amount. For example, they realize that pouring water from a tall, narrow container into a short, wide container does not change the amount of water.

Conservation of Liquid

When shown the same amount of water being poured into two identical glasses, a child will report that both glasses contain the same amount.

If the water from one of the glasses is poured into a shorter, wider container, a child who has achieved conservation of liquid probably will report that the container contains the same amount of water as the glass.

Conservation of Mass

When shown two identical balls of clay, a child will report that the balls contain the same amount.

If one of the balls is rolled out so that it becomes longer, a child who has achieved conservation of mass probably will report that it contains the same amount of clay as the ball of clay.

Conservation of Number

When shown two identical rows of coins, a child will report that the rows are identical.

If the coins in one row are spread farther apart, a child who has achieved conservation of number probably will report that the number of coins has not changed.

means of testing whether a child has developed the schema of conservation. Conservation has implications for children as eyewitnesses. Children who have achieved conservation are less susceptible to leading questions than are children who have not achieved it (Muir-Broddus, King, Downey, & Petersen, 1998).

The effect of sociocultural experiences on the timing of conservation was demonstrated in a study of children in a Mexican village whose parents were pottery makers. The children who normally helped their parents in making pottery acquired conservation (at least of mass) earlier than other children did (Price-Williams, Gordon, & Ramirez, 1969). Moreover, certain nonverbal variations of the conservation of liquid volume problem show that children might develop conservation earlier than indicated by studies that have used the traditional verbal demonstration procedure (Wheldall & Benner, 1993).

In early adolescence, the concrete operational stage might give way to the formal operational stage, which is discussed in the section of this chapter devoted to adolescent development.

Psychosocial Development

Just as Piaget believed that the child passes through stages of cognitive development, psychoanalyst Erik Erikson (1902–1994) believed that the child passes through stages of psychosocial development. Erikson observed that we go through eight distinct stages across the life span. Each stage is marked by a conflict that must be overcome, as described in Table 4-2. Research has supported Erikson's belief that we pass through the stages

TABLE 4-2 Erikson's Stages of Psychosocial Development

Age	Social Conflict	Successful Resolution of Conflict
Birth–1 year	Trust vs. mistrust	A sense of security and attachment with caregivers.
2 years	Autonomy vs. shame and doubt	A sense of independence from caregivers.
3–5 years	Initiative vs. guilt	The ability to control impulses while still being spontaneous
6 years–puberty	Industry vs. inferiority	A sense of competence in regard to a variety of everyday activities
Adolescence	Identity vs. role confusion	A mature sense of self characterized by living according to one's own values, interests, and goals
Young adulthood	Intimacy vs. isolation	The establishment of mature relationships characterized by personal commitment and emotional attachment
Middle adulthood	Generativity vs. stagnation	An investment in others and concern about their well-being.
Late adulthood	Integrity vs. despair	A sense of acceptance from reflecting on a meaningful life.

sequentially—though people differ in the ages at which they pass through them (Vaillant & Milofsky, 1980). Erikson also was one of the first researchers to consider sociocultural differences in psychosocial development, noting that the society, not just the family, affects the child's development (Eagle, 1997). This view was influenced by Erikson's studies of children in Sioux, Yurok, and other Native American cultures.

You also should be aware that there might be sociocultural differences among peoples we normally might consider to be members of a homogenous cultural group. In Central Africa, for example, infants have markedly different experiences among Ngandu farmers and neighboring Aka hunter-gatherers. Aka infants are more likely to be held, and Nkandu infants are more likely to be left alone, possibly contributing to early behavioral differences that are observed between them (Hewlett, Lamb, Shannon, Leyendecker, & Schoelmerich, 1998).

Social Attachment and Interpersonal Relationships

Erikson found that the major social conflict of the first year of infancy is **trust versus mistrust**. One of the most important factors in helping the infant develop trust is **social attachment**, a strong emotional relationship between an infant and a caregiver that develops during the first year. Beginning in the 1930s, British psychiatrist John Bowlby (1907–1990) became interested in the effects of early maternal loss or deprivation on later personality development. Much of his theorizing was based on his study of orphans whose parents were killed in World War II. Bowlby favored an evolutionary viewpoint, suggesting that infants have evolved an inborn need for attachment because their survival depends on adult caregivers (Bowlby, 1988). Thus, infants seek to maintain physical proximity and evoke responses from adults through crying, cooing, smiling, and clinging. Similarly, Sigmund Freud assumed that an infant becomes attached to his or her mother for a functional reason—she provides nourishment through nursing.

Freud's assumption was contradicted by research conducted by Harry Harlow and his colleagues on social attachment in rhesus monkeys. Harlow separated infant monkeys from their parents and peers and raised them for 6 months with two "surrogate mothers." The surrogates were wire monkeys with wooden heads. One surrogate was covered with terry cloth and the other was left bare. Harlow found that the monkeys preferred to cling to the cloth-covered surrogate, even though milk was available only from a bottle attached to the bare-wire surrogate. Harlow concluded that physical contact is a more important factor than nourishment in promoting infant attachment (Harlow & Zimmerman, 1959).

trust versus mistrust Erikson's developmental stage in which success is achieved by having a secure social attachment with a caregiver.

social attachment A strong emotional relationship between an infant and a caregiver.

Harlow's research findings inspired interest in the possible role of attachment in human psychosocial development. Of course, today's ethical standards would prevent the replication of Harlow's experiment with human infants (and perhaps even with infant monkeys). Much of what we know about attachment in human infants comes from research by Mary Ainsworth (1913–1999) on the mother-infant relationship. She was inspired by her long-time collaboration with Bowlby. Ainsworth conducted her first studies of infant-mother attachment patterns after visiting Uganda. Though cross-cultural studies have found differences in infant behaviors and maternal behaviors and beliefs, the importance of infant-mother attachment patterns has been found to generalize across many cultures (Pierrehumbert et al., 2009).

In assessing attachment, Ainsworth made a distinction between *securely attached* and *insecurely attached* infants. This becomes an especially important issue at about 8 months of age, when infants show a strong preference for their mothers over strangers and show separation anxiety. To test this, Ainsworth developed the Strange Situation: The mother and infant are in a room together; the mother leaves the room, a stranger enters the room, the stranger then leaves, and the infant's response to the mother is assessed when she then returns to the room. The securely attached infant seeks physical contact with the mother, yet, despite mildly protesting, freely leaves her to play and explore, using the mother as a secure base. In contrast, the insecurely attached infant clings to the mother, acts either apathetic or highly anxious when separated from her, and is either unresponsive or angry when reunited with her.

A meta-analysis of 21 studies using the Strange Situation with more than 1,000 infants found a moderately strong relationship between the mother's sensitivity and the infant's attachment security (De Wolff & van IJzendoorn, 1997). An infant whose mother is more sensitive, accepting, and affectionate will become more securely attached. Infants who are securely attached, in turn, have better relationships with their peers in childhood and adolescence than infants who are insecurely attached (Gorrese & Ruggieri, 2012). And research indicates that the relationship between maternal responsiveness and the quality of infant attachment generalizes across cultures. Cultural differences have been observed, though, in the maternal and infant behaviors observed in the Strange Situation, especially in measures of visual referencing—infants' willingness to play at a distance while keeping mothers within eyesight—and physical proximity seeking, such as clinging and cuddling (Leyendecker, Lamb, Fracasso, Schölmerich, & Larson, 1997; Zach & Keller, 1999).

Until recently, research on attachment has been limited to use of the Strange Situation in assessing the quality of attachment with the infant's primary caregiver—typically the mother (Field, 1996). Researchers investigating the role of the father in social development have found that paternal interaction also promotes secure attachment in infants. Moreover, families may be described as reflecting a system of attachments between infants, young children, and family members who provide care and engage them in social interaction (van IJzendoorn & DeWolff, 1997).

One study assessed the quality of attachment between mothers, fathers, and two of their children. The Strange Situation was used to measure attachment in the younger children (aged 18 to 24 months), and a questionnaire was used to measure attachment in older children (4 to 5 years of age). Parental caregiving was assessed through naturalistic observation and questionnaires. Results indicated that the majority of the children had developed secure attachments with both parents. Moreover, the quality of parental care-giving predicted secure attachment in only one case: between mothers and their younger children. Maternal caregiving was unrelated to the quality of attachment in older children. And paternal caregiving was unrelated to the quality of attachment of younger and older children (Schneider-Rosen & Burke, 1999). These findings suggest that caregiving is only one avenue by which parents, usually mothers, contribute to the development of a secure attachment in infancy. Moreover, the quality of attachment in older children appears to be related to other aspects of family interaction, such as the quality of parent-child play (Grossmann, Grossmann, Kremmer-Bombik, Scheuerer-Englisch, &

Zimmerman, 2002). And, though neglected by early research in attachment, fathers do contribute to the development of attachment in infancy and early childhood.

Researchers also have investigated the stability of attachment security across the life span. Two longitudinal studies found that attachment security is remarkably stable from infancy through adolescence (Beijersbergen, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2012) and early adulthood (Fraley, Roisman, Booth-LaForce, Owen, & Holland, 2013). In these studies, attachment category had been assessed in infancy. Later, participants completed questionnaires assessing the quality of their attachment or were interviewed by raters blind to their original classification. In both studies, the majority of the securely attached participants' classification was unchanged. But what predicts changes in attachment security? Attachment security can be adversely affected by negative life events that disrupt a family's functioning and the psychological well-being of adults in the household—and in turn their responsiveness and sensitivity to their offspring (Waters, Weinfield, & Hamilton, 2000).

According to Erikson, during the second year the child experiences a conflict involving **autonomy versus shame and doubt**. The child explores the physical environment, begins to learn self-care skills, such as feeding, and tries out budding motor and language abilities. In doing so, the child develops a greater sense of independence from her or his parents. This might account for the popular notion of the "terrible twos," when the child enjoys behaving in a contrary manner and saying no to any request. Parents who stifle efforts at reasonable independence or criticize the child's awkward efforts will promote feelings of shame and doubt. Elementary and high school teachers who support autonomy in their students have a more positively motivating style of teaching (Reeve, Bolt, & Cai, 1999).

> **autonomy versus shame and doubt** Erikson's developmental stage in which success is achieved by gaining a degree of independence from one's parents.

At 3 years of age, the child enters the stage that involves the conflict Erikson calls **initiative versus guilt**. The child shows initiative in play, social relations, and exploration of the environment. The child also learns to control his or her impulses, feeling guilt for actions that go beyond limits set by parents. So, at this stage, parents might permit their child to rummage through drawers but not to throw clothing around the bedroom. Thus, the stage of initiative versus guilt deals with the development of a sense of right and wrong.

> **initiative versus guilt** Erikson's developmental stage in which success is achieved by behaving in a spontaneous but socially appropriate way.

At about the age of 6, and continuing until about the age of 12, Erikson observed, the child faces the conflict of **industry versus inferiority**. The industrious child who achieves successes during this stage is more likely to feel competent. This is important, because children who feel academically and socially competent are happier than other children and have more positive relationships with their peers (Mouratidis & Michou, 2011). A child who develops a sense of inferiority may lose interest in academics, avoid social interactions, or fail to participate in sports. Successful resolution of the conflict over industry versus inferiority also leads to more positive feelings of vocational competence in high-school students (Gribble, 2000). The importance of this stage in psychosocial development has been demonstrated in both Western and non-Western countries, including the People's Republic of China (Zhang & Nurmi, 2012).

> **industry versus inferiority** Erikson's developmental stage in which success is achieved by developing a sense of competency.

Parent-Child Relationships

One of the most important factors in psychosocial development is the approach that parents take to child rearing. This is especially important, given the increasingly diverse family configurations within the United States. Stepparents, for example, who try to develop a friendship with their stepchildren before marrying and who continue their friendship after marrying have relationships with their stepchildren that are more likely to be marked by liking and affection. Stepparents who, instead, try to control their stepchildren are less likely to develop a positive relationship (Ganong, Coleman, Fine, & Martin, 1999). And a frequently expressed concern is whether the children of gay or lesbian parents will suffer from personal or social adjustment problems. An extensive review of research studies found no differences between the children of gay and lesbian parents and those of heterosexual parents on a number of measures of psychosocial adjustment (Wainright, Russell, & Patterson, 2004).

Parenting Style Psychologist Diana Baumrind (1966) distinguished three parenting styles: *permissive*, *authoritarian*, and *authoritative*. Permissive parents set few rules and rarely punish misbehavior. Permissiveness is undesirable because children will be less likely to adopt positive standards of behavior. At the other extreme, authoritarian parents set strict rules and rely on punishment. They respond to questioning of their rules by saying, "Because I say so!"

Authoritarian parenting, likewise, is undesirable. Authoritarian parents exert coercive power over their children, which is arbitrary and domineering (Baumrind, 2010), and which may lead to emotional abuse (Hamarman, Pope, & Czaja, 2002). Authoritarian parents also are more likely to resort to physical discipline—perhaps escalating to physical abuse. Aside from the potential for injury to the child, physical child abuse is associated with lasting emotional effects on the target of the abuse. Abused children have lower self-esteem and are more depressed (Leeson & Nixon, 2011), they tend to be more aggressive (Barry, Lochman, Fite, Wells, & Colder, 2012), and they are more likely to develop behavior problems in adolescence (Thompson, Hollis, & Richards, 2003).

Another form of physical and emotional child abuse is sexual abuse—in many cases by a parent or close family member. A review of research studies published between 1989 and 1999 found that about 10 percent of child abuse cases involve sexual abuse and about 17 percent of women and 8 percent of men had histories of sexual abuse as children (Putnam, 2003). The scourge of child sexual abuse makes it imperative that children be taught to avoid situations that might make them potential targets of sex abusers. Of great concern is the vicious cycle in which abused children become abusive parents. However, though most child abusers were abused as children, only one-third of abused children become abusers—a far cry from claims that being an abused child automatically makes one a future child abuser (Putnam, 2003). So, if you were unfortunate enough to have a history of child abuse, you may very well be able to break the vicious cycle when rearing your own children.

authoritative parenting An effective style of parenting in which the parent is warm and loving yet sets well-defined limits that he or she enforces in an appropriate manner.

Baumrind has found that the best approach to child rearing is **authoritative parenting** (Baumrind, 1983). Authoritative parents tend to be warm and loving, yet insist that their children behave appropriately. They encourage independence within well-defined limits, show a willingness to explain the reasons for their rules, and permit their children to express verbal disagreement with them. By maintaining a delicate balance between freedom and control, authoritative parents help their children internalize standards of behavior.

Children of authoritative parents report better physical and psychological well-being than children of authoritarian or permissive parents Children who have authoritative parents are more likely to be socially competent, independent, and responsible. They are less likely to drink alcohol or smoke (Piko & Balázs, 2012), more likely to perform well in school (Mattanah, Pratt, Cowan, & Cowan, 2005), and more likely to be autonomous and display a mastery orientation, which is essential for motivation (Kudo, Longhofer, & Floersch, 2012). But, as cautioned in Chapter 2, be wary of concluding that parenting style causes these effects. Remember that only experimental, not correlational, research permits statements about causality. Perhaps the direction of causality is the opposite of what one would assume. For example, children who behave properly might evoke authoritative parenting.

Research tends to support a positive relationship between authoritative parenting and children's competence. But we still do not know how or why it does so (Darling & Steinberg, 1993). Though the relationship between authoritative parenting and healthy child development appears to be a universal phenomenon (Zhou et al., 2008), we must be aware of cultural differences in child rearing—both between and within societies. Cultural differences in beliefs about parental and child roles and the nature of child rearing influence parents' interactions with their children (Rudy & Grusec, 2001). For example, Chinese parenting may be seen as authoritarian and controlling. Chinese cultural beliefs about parenting stress the concept of *chiao shun*, or training the child to meet social expectations. Thus, parental control may have different meanings in cross-cultural contexts (Chao, 1994; 2001).

Day Care Another important, and sometimes controversial, factor in child rearing is day care. The number of American children placed in day care increased during the 1990s, with more than half of infants and toddlers spending at least 20 hours per week in the care of adults other than their parents (Singer, Fuller, Keiley, & Wolf, 1998). Though day care, overall, seems to have neither strong benefits nor strong detrimental effects (Lamb, 1996), research findings are contradictory in regard to the effects of day care on infants. On the negative side are studies finding that infant day care of more than 20 hours a week in the first year of life is associated with insecure attachment during infancy and greater non-compliance and aggressiveness in early childhood (Hill, Wadlfogel, Brooks-Gunn, & Han, 2005) and that children who enter day care before age 2 later perform more poorly in high school than do children who enter day care after age 2 (Ispa, Thornburg, & Gray, 1990). Of course, we can never be sure about the cause and effect from studies such as these. On the positive side are studies finding that infants in day care do not become insecurely attached (Burchinal, Bryant, Lee, & Ramey, 1992) and that they later do well in school and act less aggressively than other children do (Field, 1991). And a longitudinal study that examined preschoolers' behavior before and after their mothers returned to work showed no negative outcomes (Chase-Lansdale et al., 2003). These contradictory findings reflect the complex nature of the issue, which involves numerous variables, including the characteristics of the infants, their parents, their caretakers, and the day-care settings.

Because many working parents have no choice but to place their infants in day care, it is reassuring to know that research indicates that high-quality infant day care is probably not harmful (Maccoby & Lewis, 2003). According to findings of the National Institute of Child Health and Human Development Study of Early Child Care, "high-quality" means that the number of children and the adult-child ratio are small, the adults practice nonauthoritarian caregiving, and the environment is safe, clean, and stimulating (NICHD Early Child Care Research Network, 1997). Some researchers have found that high-quality daycare can have long-term benefits on children's cognitive and social emotional development (Peisner-Feinberg et al., 2001). High-quality day care has been found to be especially influential in the prevention of behavior problems in low-income boys and African American children (Votruba-Drzal et al., 2010). Though, overall, day care has neither positive nor negative effects on infants or children, poor day care and lack of a stable care provider tend to have a negative effect (Lamb, 1996). But the cost of high-quality day care—if it is, in fact, available—makes it unaffordable to many families. Nonetheless, even day care that is not optimal tends not to have damaging effects on most children. Heredity and home environment tend to outweigh the effects of day care, even when it is not of high quality (Scarr, 1998).

Parental Conflict Children are affected not only by parenting styles and day-care practices but also by the quality of their parents' relationship. A meta-analysis of relevant studies found that parental discord spills over into negative parent-child relationships (Erel & Burman, 1995). Moreover, marital discord can undermine the child's feeling of emotional security and lead to adjustment problems in childhood and adolescence (Klahr, Rueter, McGue, Iacono, & Alexander, 2011) and marital discord in adulthood (Davies & Cummings, 1994).

In some cases marital discord leads to divorce. Because about half of all marriages in the United States end in divorce, many children spend at least part of their childhood primarily with one parent. Though it is easier for two adults to meet the stressful demands of providing the consistent, responsive caregiving that promotes children's well-being, research on single parents indicates that one responsible, emotionally available adult can provide the social and emotional bond that is essential to optimal childhood development (Silverstein & Auerbach, 1999). More than one-third of American children born in the past three decades will experience parental divorce. And they will be more likely to suffer emotional problems, particularly depression (Aseltine, 1996). The long-term effects of divorce on children include greater personal distress and more problems in intimate relationships in adulthood (Christensen & Brooks, 2001).

Because divorce involves so many variables, including the age and economic status of the parents, the age of the children, and the custody arrangements, different combinations of these variables can have different effects on the children (Lamb, 2012). The effects of each combination remain to be determined. It should be noted, however, that children from divorced families have a greater sense of well-being than children from intact families with intense parental conflict (Amato & Keith, 1991). Moreover, divorce itself might induce less distress in children than parental conflict prior to the divorce. A meta-analysis of research studies published during the 1990s on the well-being of children of divorce versus children from intact families found that children of divorce were worse off on variables such as self-esteem, personal conduct, psychological adjustment, interpersonal relationships, and academic performance. These differences were slightly greater in later studies than those reported in studies conducted during the 1980s (Reifman, Villa, Amans, Rethinam, & Telesca, 2001).

Interaction with Peers

Children are affected by their relationships with friends and siblings as well as those with their parents. Friendships provide the context for social and emotional growth (Newcomb & Bagwell, 1995). Secure attachment to both mothers and fathers provides a solid basis for friendships (Verissimo et al., 2011). And childhood friendships may have a bearing on adult emotional well-being. Consider a study that compared young adults who had a best friend in fifth grade and young adults who had no friends in fifth grade. Those who had a best friend had higher self-esteem than those who had no friends. And those who had no best friend were more likely to have symptoms of psychological disorders (Bagwell, Newcomb, & Bukowski, 1998). Of course, you must be careful not to assume that there is a causal relationship in which friendships promote healthy personalities. Perhaps, instead, children with certain personalities are simply more likely to make friends and to have higher self-esteem.

Few children develop friendships before the age of 3, and 95 percent of childhood friendships are between children of the same sex (Hartup, 1989). Girls tend to have fewer, but more intimate, friendships than do boys (Berndt & Hoyle, 1985). A meta-analysis of children's peer relations found that socially and academically competent children are popular with their peers. In contrast, children who are withdrawn, aggressive, or academically deficient tend to be rejected by their peers (Newcomb, Bukowski, & Pattee, 1993).

Peer relationships in childhood involve play. A classic study (Parten, 1932) found that the interactive play of children gradually increased between 2 and 4 years of age, but that throughout this period, children engaged mainly in parallel play, as when two children in a sandbox play separately from each other with pails and shovels. Parallel play provides a transition into social play, in which children play interactively, with children as old as 4 years alternating between the two (Anderson, 2001). There also are cultural differences in play. For example, whereas gender-segregated play appears to be a universal phenomenon, there are cultural differences in the extent to which children engage in cross-sex play (Aydt & Corsaro, 2003).

Gender-Role Development

gender roles Behaviors that are considered appropriate for women or men in a given culture.

One of the most frequently studied aspects of psychosocial development in childhood is the development of **gender roles**, which are behavior patterns that are considered appropriate for men or women in a given culture. The first formal theory of gender-role development was put forth by Sigmund Freud. He assumed that the resolution of what he called the Oedipus (in the case of boys) and Electra (in the case of girls) complexes (discussed in Chapter 13) at age 5 or 6 led the child to internalize the gender role of the same-sex parent. The Oedipus and Electra complexes begin with the child's sexual attraction to the other-sex parent. According to Freud, because the child fears punishment for desiring the other-sex parent, the child comes to identify with the same-sex parent. But studies of children show that children develop gender roles even when they live in single-parent

households. Because of the lack of research support for Freud's theory, most researchers favor more recent theories of gender-role development.

Social learning theory stresses the importance of observational learning, rewards, and punishment. Thus, social learning theorists assume that the child learns gender-relevant behaviors by observing gender-role models and by being rewarded for appropriate, and corrected or punished for inappropriate, gender-role behavior. This process of gender typing begins on the very day of birth and continues through the life span. In one study, new parents were interviewed within 24 hours of the birth of their first child. Though there are no observable differences in the physical appearance of male and female newborns whose genitals are covered, newborn daughters were more likely to be described by their parents as cute, weak, and uncoordinated than newborn sons were (Rubin, Provenzano, & Luria, 1974). But an influential review of research by Eleanor Maccoby found that parents reported that they did not treat their sons and daughters differently (Maccoby & Jacklin, 1974). Of course, parents might believe that they treat their daughters and sons the same, while actually treating them differently. A meta-analysis, however, supported Maccoby by finding that gender-role development seems, at best, weakly related to differences in how parents rear their sons and daughters (Lytton & Romney, 1991).

Parents are not the only social influences contributing to gender-role development. As noted earlier in this chapter, children tend to socialize with same-sex peers and engage in sex-segregated play. Children reward each other for engaging in gender-appropriate activities and punish or exclude children who engage in cross-gender behavior. Moreover, this peer pressure is stronger for boys than for girls. Considering the inconsistent evidence for the role of differential parental reinforcement of children's behaviors, it is very likely that peers may wield a stronger influence on gender-role development than do parents (Bussey & Bandura, 1999). One such factor is the sex of one's siblings. A large-scale study of 3-year-olds found that both boys and girls with an older brother were more masculine and less feminine. Boys with an older sister were more feminine but not less masculine. And girls with an older sister were less masculine but not more feminine (Rust, Golombok, Hines, Johnston, & Golding, 2000).

An alternative to the social learning theory of gender-role development is Sandra Bem's (1981) **gender schema theory**, which combines elements of social learning theory and the cognitive perspective. Bem's theory holds that people differ in the schemas they use to

social learning theory A theory of learning that assumes that people learn behaviors mainly through observation and mental processing of information.

gender schema theory A theory of gender-role development that combines aspects of social learning theory and the cognitive perspective.

Gender Roles

According to social learning theory, children learn gender-role behaviors by being rewarded for performing those behaviors and by observing adults, particularly parents, engaging in them.
Source: XiXinXing/Shutterstock.com.

organize their social world. People may have schemas relevant to age, ethnicity, gender, occupations, or any number of social categories. *Gender schemas* are specialized cognitive structures that assimilate and organize information about women and men. Children are *gender schematic* if they categorize people, behavior, activities, and interests as masculine or feminine. In contrast, *gender aschematic* children do not categorize these types of information into masculine and feminine categories. Gender schematic individuals are likely to notice, attend to, and remember people's behavior and attributes that are relevant to gender. For example, one study found that gender schematic adults recalled more gender-stereotypic information than did gender aschematic adults (Renn & Calvert, 1993).

Gender schemas develop early. One study found that toddlers were able to label same-sex toys—operationally defined as touching a masculine or feminine toy—as early as 2 years of age (Levy, 1999). Social experiences can modify the development of gender schema, though, as shown in studies of traditional and egalitarian families. A meta-analysis of 48 studies found that parents' gender schemas were correlated with their children's gender schemas. Though the effect size was small, traditional parents were more likely than nontraditional parents to have children who thought about themselves and others in gender-typed ways (Tenenbaum & Leaper, 2002). Gender schema theory provides a glimpse into the development of gender stereotypes and how gender stereotypes influence social behavior (Deaux & Major, 1987).

Moral Development

American psychologists have researched and tested the development of morality in children and adults for more than a century (Wendorf, 2001). Today, the most influential theory of moral development is Lawrence Kohlberg's (1981) cognitive-developmental theory.

Kohlberg's Theory of Moral Development Kohlberg's theory, formulated in the 1960s, is based on Piaget's (1932) proposal that a person's level of moral development depends on his or her level of cognitive development. Piaget found that children, in making moral judgments, are at first more concerned with the consequences of actions. Thus, a young child might insist that accidentally breaking ten dishes is morally worse than purposely breaking one dish. As children become more cognitively sophisticated, they base their moral judgments more on a person's intentions than on the consequences of the person's behavior. Kohlberg assumed that as individuals become more cognitively sophisticated, they reach more complex levels of moral reasoning. Research findings indicate that adequate cognitive development is, indeed, a prerequisite for each level of moral reasoning (Walker, 1986).

Kohlberg, agreeing with Piaget, developed a stage theory of moral development based on the individual's level of moral reasoning. Kohlberg determined the individual's level of moral reasoning by presenting a series of stories, each of which includes a moral dilemma. The person must suggest a resolution of the dilemma and give reasons for choosing that resolution. The person's stage of moral development depends not on the resolution, but instead on the reasons given for that resolution. What is your response to the following dilemma proposed by Kohlberg? Your reasoning in resolving it would reveal your level of moral development:

> In Europe, a woman was near death from a very bad disease, a rare kind of cancer. There was one drug that the doctors thought might save her. It was a special form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging 10 times what the drug cost him to make. He paid 200 dollars for the radium and charged two thousand dollars 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 get together only about one thousand dollars, which was 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 am going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. (Kohlberg, 1981, p. 12)

TABLE 4-3 Kohlberg's Theory of Moral Development

Level of Moral Development	Stage of Moral Development
Preconventional level: Concern with consequences of behavior for oneself	**Stage 1:** Moral choices made to avoid punishment
	Stage 2: Moral choices made to gain rewards
Conventional level: Concern with social laws and values	**Stage 3:** Moral choices made to gain social approval
	Stage 4: Moral choices made to fulfill duty, respect authority, and maintain social order
Postconventional level: Concern with moral principles, agreed-upon laws, and human dignity	**Stage 5:** Moral choices made to follow mutually agreed-upon principles and ensure mutual respect of others
	Stage 6: Moral choices made to uphold human dignity and one's own ethical principles

The levels of moral development represented by particular responses to this dilemma are presented in Table 4-3. Kohlberg has identified three levels: the *preconventional*, the *conventional*, and the *postconventional*. Each level contains two stages, making a total of six stages of moral development. As Piaget noted, as we progress to higher levels of moral reasoning, we become more concerned with the actor's motives than with the consequences of the actor's actions. This was supported by a study of moral judgments about aggressive behavior, which found that high school and college students at higher stages of moral reasoning were more concerned with the aggressor's motivation than were students at lower stages (Berkowitz, Mueller, Schnell, & Padberg, 1986).

People at the **preconventional level** of moral reasoning, which typically characterizes children up to 9 years old, are mainly concerned with the consequences of moral behavior to themselves. In stage 1, the child has a punishment and obedience orientation, in which moral behavior serves to avoid punishment. In stage 2, the child has an instrumental-relativist orientation, in which moral behavior serves to get rewards or favors in return, as in "you scratch my back and I'll scratch yours."

People at the **conventional level** of moral reasoning, usually reached in late childhood or early adolescence, uphold conventional laws and values by favoring obedience to parents and authority figures. Kohlberg calls stage 3 the good boy/nice girl orientation because the child assumes that moral behavior is desirable because it gains social approval, especially from parents. Kohlberg calls stage 4 the society-maintaining orientation, in which the adolescent views moral behavior as a way to do one's duty, show respect for authority, and maintain the social order. These four stages have even been used to show differences in moral reasoning among members of the U.S. Congress about political issues (Shapiro, 1995).

At the end of adolescence, some of those who reach Piaget's formal operational stage of cognitive development also reach the **postconventional level** of morality. At this level of moral reasoning, people make moral judgments based on ethical principles that might conflict with their self-interest or with the maintenance of social order. In stage 5, the social-contract orientation, the person assumes that adherence to laws is in the long-term best interest of society but that unjust laws might have to be violated. The U.S. Constitution is based on this view. Stage 6, the highest stage of moral reasoning, is called the universal ethical principle orientation. The few people at this stage assume that moral reasoning must uphold human dignity and their conscience—even if that brings them into conflict with their society's laws or values. Thus, an abolitionist who helped runaway American slaves flee to Canada in the 19th century would be acting at this highest level of moral reasoning.

preconventional level In Kohlberg's theory, the level of moral reasoning characterized by concern with the consequences that behavior has for oneself.

conventional level In Kohlberg's theory, the level of moral reasoning characterized by concern with upholding laws and conventional values and by favoring obedience to authority.

postconventional level In Kohlberg's theory, the level of moral reasoning characterized by concern with obeying mutually agreed-upon laws and by the need to uphold human dignity.

Criticisms of Kohlberg's Theory Kohlberg's theory has received mixed support from research studies. Children do appear to proceed through the stages he described in the order he described (Walker, 1989). And a study of adolescents on an Israeli kibbutz found that, as predicted by Kohlberg's theory, their stages of moral development were related to their stages of cognitive development (Snarey, Reimer, & Kohlberg, 1985). But Kohlberg's theory has been criticized on several grounds. First, the theory explains moral reasoning, not moral action. A person's moral actions might not reflect her or his moral reasoning. Yet some research supports a positive relationship between moral reasoning and moral actions. For example, one study found that college students who believed that the use of illegal drugs was morally wrong based on principle were, in fact, less likely to use drugs than peers who believed that illegal drug use was a matter of simple personal choice (Abide, Richards, & Ramsay, 2001).

A second criticism is that the situation, not just the person's level of moral reasoning, plays a role in moral decision making and moral actions. This was demonstrated in a study of male college students who performed a task in which their goal was to keep a stylus above a light moving in a triangular pattern—a tedious, difficult task. When provided with a strong enough temptation, even those at higher stages of moral reasoning succumbed to cheating (Malinowski & Smith, 1985).

Other critics insist that Kohlberg's theory might not be generalizable beyond Western cultures, with their greater emphasis on individualism (Sachdeva, Singh, & Medin, 2011). This criticism has been countered by Kohlberg and his colleagues. They found that when people in other cultures are interviewed in their own languages, using moral dilemmas based on situations that are familiar to them, Kohlberg's theory holds up well. Moreover, in other cultures, the stages of moral reasoning unfold in the order claimed by Kohlberg. For example, a study of Taiwanese children and young adults found that they progressed through the moral stages in the order and at the rate found in Americans (Lei, 1994). Nonetheless, postconventional moral reasoning is not found in all cultures (Snarey, Reimer, & Kohlberg, 1985).

Still another criticism of Kohlberg's theory is that it is biased in favor of a male view of morality. The main proponent of this criticism has been Carol Gilligan (1982). She points out that Kohlberg's theory was based on research on male participants, and she claims that Kohlberg's theory favors the view that morality is concerned with detached, legalistic justice (an allegedly masculine orientation) rather than with involved, interpersonal caring (an allegedly feminine orientation).

Thus, Gilligan believes that women's moral reasoning is colored by their desire to relieve distress, whereas men's moral reasoning is based on their desire to uphold rules and laws. Because Kohlberg's theory favors a male view, women are unfairly considered lower in moral development. Despite some research support for Gilligan's position (Garmon, Basinger, Gregg, & Gibbs, 1996), there does not appear to be a moral chasm between men and women—there are no significant differences between men and women in their use of justice and care orientations. For example, a recent study lent only mixed support to Gilligan's position. More than 200 men and women rated hypothetical mixed (containing elements of both care and justice orientations) and real-life (conflicts they had personally experienced) moral dilemmas. As Gilligan would predict, women scored higher on care reasoning and men scored higher on justice reasoning on the hypothetical mixed dilemmas. However, there were no gender differences in the ratings of the real-life moral dilemmas. Regardless of participant sex, real-life moral dilemmas involving ongoing personal relationships elicited care reasoning. And real-life moral dilemmas concerning the self or casual acquaintances elicited justice reasoning (Skoe, Cumberland, Eisenberg, Hansen, & Perry, 2002). Moreover, a meta-analysis found that females exhibit a care orientation only slightly more than males, and males exhibit a justice orientation only slightly more than females (Jaffee & Hyde, 2000).

Other critics claim that both Kohlberg's and Gilligan's theories are simplistic and do not consider enough of the factors that influence moral development. These critics believe that an adequate theory of moral development must consider the interaction of cultural, religious, and biological factors (Woods, 1996).

Adolescent Development

Change marks the entire life span, though it is more dramatic at certain stages than at others. Biological factors have a more obvious influence during adolescence and late adulthood than during early and middle adulthood. Social factors exert their greatest influence through the **social clock**, which includes major events that occur at certain times in the typical life cycle in a given culture. In Western cultures, for example, major milestones of the social clock include graduation from high school, leaving home, finding a job, getting married, having a child, and retiring from work. Being late in reaching these milestones can cause emotional distress (Rook, Catalano, & Dooley, 1989).

There also is some evidence for cross-cultural and cohort differences in young adults' beliefs about the timing of life events. For example, one study of Australian undergraduates found that the "best" ages associated with adult milestones differed from American age norms of the 1960s. Moreover, participants suggested later ages for marriage and grandparenthood and a wider age range for retirement (Peterson, 1996).

Cultural and historical factors can have different effects on different cohorts. Depending on your cohort, your adolescent and adult experiences might differ from those of other cohorts. A Swiss study compared young adult participants born between World Wars I and II (the "Between the Wars" cohort) participants born in the years immediately after World War II (the "Early Baby Boomers" cohort) and participants born in the early 1970s (the "Generation X" cohort) regarding their views concerning the main tasks of young adulthood. The largest difference was between the "Between the Wars" cohort and the "Generation X" cohort. Whereas the "Between the Wars" cohort placed relatively more value on work and family, the "Generation X" cohort placed relatively more value on higher education and leisure-time activities (Bangerter, Grob, & Krings, 2001).Thus, as you read, keep in mind that although common biological factors and social clocks might make generations somewhat similar in their development, cultural and historical factors that are unique to particular cohorts can make them somewhat different from cohorts that precede or succeed them.

Adolescence is unknown in many developing countries. Instead, adulthood begins with the onset of puberty and is commonly celebrated with traditional rites of passage. With the advent of universal free education and child labor laws in Western countries, children, who otherwise would have entered the adult work world by the time they reached puberty, entered a period of life during which they developed an adult body yet maintained a childlike dependence on parents. Formal study of **adolescence**, the transitional period between childhood and adulthood, began with the work of G. Stanley Hall (1904).

Physical Development

Recall your own adolescence. What you might recall most vividly are the rapid physical changes associated with **puberty** (from the Latin word for "adulthood"). As illustrated in Figure 4-4, puberty is marked by a rapid increase in height; girls show a growth

social clock The typical or expected timing of major life events in a given culture.

adolescence The transitional period lasting from the onset of puberty to the beginning of adulthood.

puberty The period of rapid physical change that occurs during adolescence, including the development of the ability to reproduce sexually.
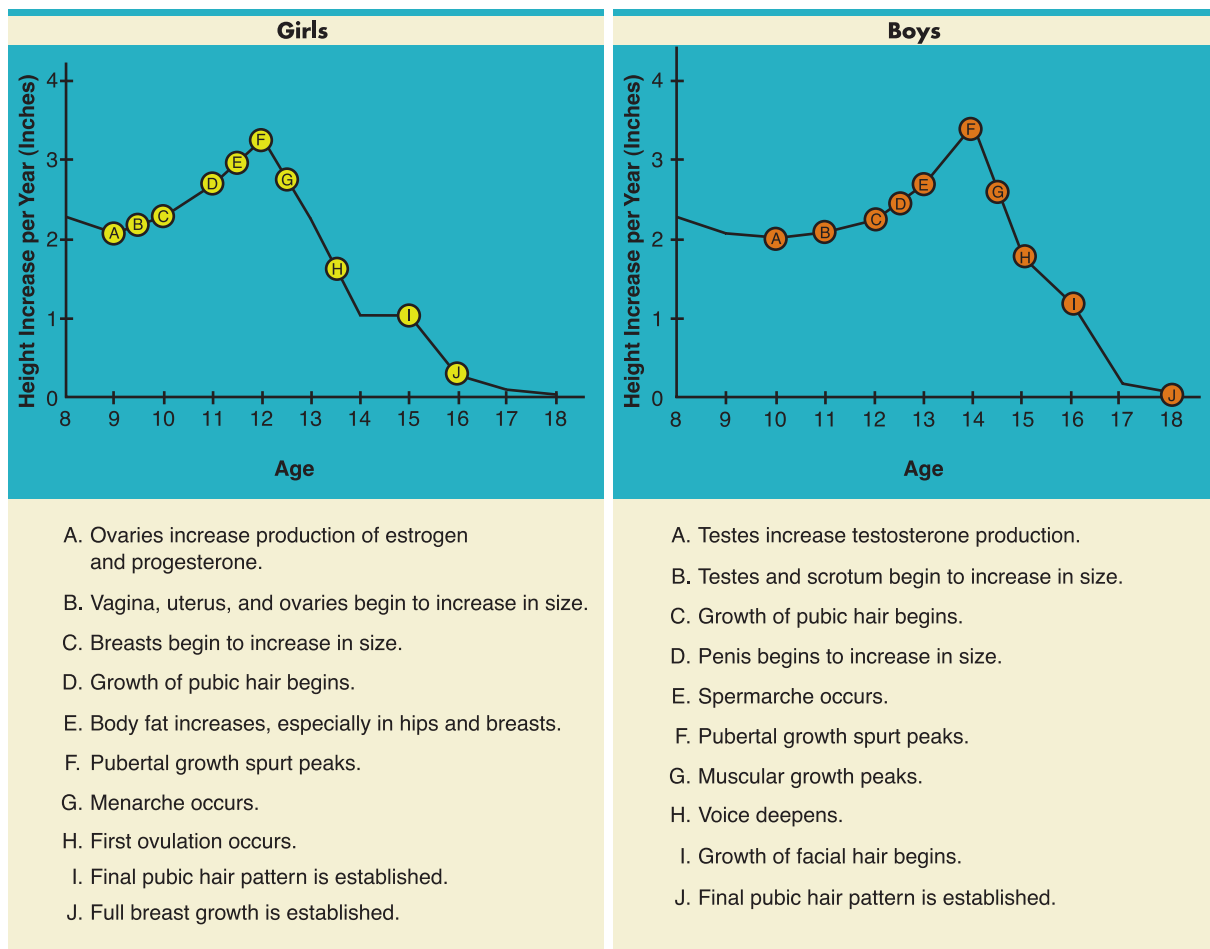
Girls

A. Ovaries increase production of estrogen and progesterone.

B. Vagina, uterus, and ovaries begin to increase in size.

C. Breasts begin to increase in size.

D. Growth of pubic hair begins.

E. Body fat increases, especially in hips and breasts.

F. Pubertal growth spurt peaks.

G. Menarche occurs.

H. First ovulation occurs.

I. Final pubic hair pattern is established.

J. Full breast growth is established.

Boys

A. Testes increase testosterone production.

B. Testes and scrotum begin to increase in size.

C. Growth of pubic hair begins.

D. Penis begins to increase in size.

E. Spermarche occurs.

F. Pubertal growth spurt peaks.

G. Muscular growth peaks.

H. Voice deepens.

I. Growth of facial hair begins.

J. Final pubic hair pattern is established.

FIGURE 4-4 The Adolescent Growth Spurt and Pubertal Change

The onset of puberty is associated with a rapid increase in height. The growth spurt of girls occurs earlier than that of boys. Note that the ages given for the timing of particular physical changes during puberty are based on averages. Individual pubertal changes may vary from these averages without falling outside the range of normal development.

spurt between the ages of 10 and 12, and boys show a growth spurt between the ages of 12 and 14. The physical changes of puberty also include the maturation of primary and secondary sex characteristics. Primary sex characteristics are hormone-induced physical changes that enable us to engage in sexual reproduction. These changes include growth of the penis and testes in males and the vagina, uterus, and ovaries in females. Secondary sex characteristics are stimulated by sex hormones but are unrelated to sexual reproduction. Pubertal males develop facial hair, deeper voices, and larger muscles. Pubertal females develop wider hips, larger breasts, and more rounded physiques, caused in part by increased deposits of fat.

These physical changes are triggered in girls by a spurt in the secretion of the sex hormone estrogen between ages 10 and 11 and in boys by increased levels of the sex hormone testosterone between ages 12 and 13. Boys generally experience **spermarche**, their first ejaculation, between the ages of 13 and 15, typically while asleep (so-called nocturnal emissions). Girls exhibit earlier physical maturation than boys and generally experience **menarche**, their first menstrual period, between the ages of 11 and 13 (Paikoff & Brooks-Gunn, 1991). The average age at menarche is lower than in the past; this decline in the age of menarche has been attributed to improved health and nutrition. For example, the average age of menarche declined from 16.5 to 13.7 years over a span of 40 years in two rural counties of China. During this period of modernization, the health and living conditions of the rural Chinese population improved dramatically (Graham, Larsen, & Xu, 1999). And increasing rates of obesity across the globe are associated with a decline in the

spermarche The first ejaculation, usually occurring between the ages of 13 and 15.

menarche The beginning of menstruation, usually occurring between the ages of 11 and 13.

Because adolescents enter puberty at different ages, groups of young adolescents include individuals who vary greatly in height and physical maturity. As a consequence, a typical middle-school class might appear to include a wider age range than it actually does.

Source: Tracy Whiteside/Shutterstock.com.

average age of menarche. The Health Behavior in School-Aged Children study assessed the relationship between obesity and the average age of menarche among girls in 34 countries. The researchers concluded that most cross-cultural differences in the average age of menarche were attributable to childhood obesity (Currie et al., 2012).

Though the dramatic physical changes of puberty are caused by hormonal changes, adolescent mood swings are not necessarily the by-products of hormones run wild. Hormone fluctuations affect the adolescent's moods, but life events have a greater effect (Brooks-Gunn & Warren, 1989). Of course, the physical changes of puberty, including acne, rapid growth, and physical maturation, can themselves produce emotional distress. This is especially true if the adolescent is unprepared for them or is made to feel self-conscious by peers or parents. Boys find it difficult enough to deal with scruffy facial hair, unwanted penile erections, and voices that crack, without being made more anxious about those changes. Girls, likewise, find it difficult enough to discover suddenly that they have enlarged breasts, a monthly menstrual cycle, and possibly tower several inches above many of their male peers.

The timing of puberty may influence how adolescents respond to these physical changes. Research findings on the relative effects of early versus late puberty have been inconsistent, in part because of the different methodologies that have been used. Cross-sectional research findings indicate that late maturation is, overall, more negative for both males and females in regard to behavior and personal adjustment, but longitudinal research findings indicate that the timing of puberty, overall, has neither positive nor negative effects on adolescents (Dorn, Susman, & Ponirakis, 2003). Nonetheless, at times early maturation may bring with it certain problems. For example, boys and girls who enter puberty early drink more alcohol and become intoxicated more often than their peers who do not mature early. This correlation is stronger for boys than for girls (Kaltiala-Heino, Koivisto, Marttunen, & Fröjd, 2011).

Cognitive Development

Adolescent cognitive development is less dramatic, with no obvious surge in mental abilities to match the surge in physical development. According to Piaget's theory, at about 11 years of age, some adolescents pass from the concrete operational stage to the **formal operational stage**. A person who reaches this stage is able to reason about abstract, not just concrete, situations. The adolescent who has reached the formal operational stage can apply abstract principles and make predictions about hypothetical situations. In contrast, an adolescent still in the concrete operational stage would rely more on blind trial and error than on a formal approach to problem solving.

formal operational stage The Piagetian stage, beginning at about age 11, marked by the ability to use abstract reasoning and to solve problems by testing hypotheses.

To appreciate this, imagine that you are given four chemicals and are asked to produce a purple liquid by mixing them—but it is left up to you to discover the proper mixture. People at the concrete operational level would approach this task in an unsystematic manner, hoping that through trial and error they would hit upon the correct combination of chemicals. In contrast, people at the formal operational level would approach it systematically, perhaps by mixing each possible combination of two of the chemicals, then each possible combination of three, and finally all four. Thus, people who reach the formal operational stage perform better on more complex intellectual pursuits. A study of seventh and eighth graders found that those in transition between the concrete operational stage and the formal operational stage showed better understanding of abstract concepts presented in a physics textbook than did those still in the concrete operational stage (Renner, Abraham, Grzybowski, & Marek, 1990).

Piaget found that so few people reach the formal operational stage that he gave up his earlier belief that it was universal. Those who reach that stage are more likely to have been exposed to scientific thinking in their academic courses (Rogoff & Chavajay, 1995). Though educational interventions have been effective in fostering the development of formal operational thought in developing countries such as Pakistan (Iqbal & Shayer, 2000), people from cultures that do not stress science in their school curricula are less likely to achieve the formal operational stage.

Psychosocial Development

Erik Erikson noted that psychosocial development continues through adolescence into adulthood and old age. Perhaps the most important psychosocial tasks of adolescence are the formation of a personal identity and the development of healthy relationships with peers and parents.

Identity Achievement

identity versus role confusion
Erikson's developmental stage in which success is achieved by establishing a sense of personal identity.

According to Erikson (1963), the most important feat of adolescence is the resolution of the conflict of **identity versus role confusion**. The adolescent develops a sense of identity by adopting her or his own set of values and social behaviors. Erikson believed this is a normal part of finding answers to questions related to one's identity, such as these: What do I believe is important? What are my goals in life?

Erikson's emphasis on the importance of the identity crisis might reflect, in large part, his own life history. He was born in Germany, the child of a Danish Christian mother and father. Erik's father abandoned his mother while she was pregnant with him. She then married a Jewish physician, Theodore Homburger. Erik was given his new father's surname, making him Erik Homburger. But it was not until Erik reached adolescence that he was told that Homburger was not his biological father (Hopkins, 1995).

Erikson, uncomfortable among Jews and Christians alike, sought to find himself by traveling in European artistic and intellectual circles, as many young adults did in the 1920s. Eventually he met Anna Freud, Sigmund's daughter and an eminent psychoanalyst herself. Erikson underwent psychoanalysis with her almost daily for 3 years. In 1933 Erikson changed his name to Erik Homburger Erikson and left to pursue a career in the United States. His long, rich life was a testament to his success in finding his identity as a husband, writer, teacher, and psychoanalyst.

To appreciate the task that confronts the adolescent in developing an identity, consider the challenge of having to adjust simultaneously to a new body, a new mind, and a new social world. The adolescent body is larger and sexually mature. The adolescent mind can question the nature of reality and consider abstract concepts regarding ethical, political, and religious beliefs. The social world of the adolescent requires achieving a balance between childlike dependence and adultlike independence. This also manifests itself in the conflict between parental and peer influences. Children's values mirror their parents', but adolescents' values oscillate between those of their parents and those of their peers. Adolescents move from a world guided by parental wishes to a world in which they are con-

fronted by a host of choices regarding sex, drugs, friends, schoolwork, and other things. Erikson's theory of adolescence has received support from longitudinal studies showing that, in fact, adolescents typically move from a state of role confusion to a state of identity achievement (Streitmatter, 1993). Among the factors that are related to successful identity achievement are positive parental involvement with the adolescent and active interest in the adolescent's school performance and social relationships (Brittain & Lerner, 2013).

There also is some evidence that Erikson's theory may generalize to adolescents' experiences across cultures. One study found that Hong Kong adolescents who achieved a sense of identity were more prosocial and exhibited fewer antisocial behaviors than adolescents who had not (Ma, Shek, Cheung, & Oi, 2000). And African adolescents who achieved a sense of identity reported more extensive exploration of career options and held broader vocational interests than adolescents who had not (Schmitt-Rodermund & Vondracek, 1999). Successful identity achievement is positively related to personal adjustment (Hunsberger, Pratt, & Pancer, 2001). Failure to achieve a sense of identity is associated with emotional distress, including feelings of emptiness and depression (Taylor & Goritsas, 1994).

But Carol Gilligan (1982) believes that Erikson's theory applies more to male than to female adolescents. She points out that Erikson based his theory on studies of men, who tend to place a greater premium on the development of self-sufficiency than do women, who tend to place a greater premium on intimate relationships in which there is mutual caring. Thus, female adolescents who fail to develop an independent identity at the same time as their male age peers might unfairly be considered abnormal. One recent study compared self-descriptions and personality attributes of male and female undergraduates. Self-descriptions of men and women who had achieved identity were more similar than the self-descriptions of men and women who had not. However, gender differences were found in the relationship of personality variables that have been thought to contribute to identity development (Cramer, 2000). Though intimate relationships are important to both men's and women's well-being, psychologists studying gender differences in identity development believe that women's identity development emphasizes the self in relation to others.

Psychologists also have investigated the nature of ethnic identity, particularly among immigrants and members of ethnic minority groups (Phinney, 1990). Studies of ethnic and American identity in multi-ethnic samples have found that ethnic identity is positively correlated with self-esteem—regardless of participants' ethnicities. Thus, positive attitudes toward one's ethnic group contribute to high self-esteem. Ethnic and American identity, however, tend to be strongly correlated only for European American participants (Phinney, Cantu, & Kurtz, 1997). Ethnic identity was found to be positively correlated with many measures of psychological adjustment, including optimism, mastery, and coping, in a multi-ethnic sample of over 5,400 American adolescents (Roberts et al., 1999).

Identity Formation

During adolescence our peers play a large role in the development of our sense of identity. Generation after generation, this has distressed North American parents—though, as adolescents, their stylistic choices may have upset their own parents.

Sources: Left: Gina Smith/ Shutterstock.com. *Right:* marcogarrincha/Shutterstock .com.

This research has important implications for members of ethnic minority groups, many of whom consider themselves to be bicultural. One study assessed ethnic identity and measures of acculturation among 1,367 American undergraduates, most of whom were of Mexican origin. Ethnic identity was strongest for first-generation and less acculturated participants. And higher levels of acculturation were associated with a diminished sense of ethnic identity and belongingness. More positive outcomes were associated with participants who were high in biculturalism—that is, feeling a part of both majority American and traditional Mexican cultures. Participants who scored high on a measure of biculturalism had higher ethnic identity scores and were more socially oriented than participants who scored low on biculturalism (Cuellar, Roberts, Nyberg, & Maldonado, 1997).

Once again, this demonstrates the importance of considering the cultural context of theoretical positions. For example, the Inuit people of Canada see personal identity as inseparable from the physical, animal, and human environments. The Inuits would find it maladaptive if members of their culture formed more individualistic identities (Stairs, 1992).

Social Relationships

Because the adolescent is dependent on parents while seeking an independent identity, adolescence has traditionally been considered a period of conflict between parents and children, or what G. Stanley Hall called a period of "storm and stress." Parents might be shocked by their adolescent's preferences in dress, music, and slang. In trying out various styles and values, adolescents are influenced by the cohort to which they belong. Thus, male adolescents shocked their parents by wearing pompadours in the 1950s, shoulder-length hair in the 1970s, spiked haircuts in the 1990s, and piercings and tattoos at the turn of the 21st century. Though parental conflict, moodiness, and a tendency for engaging in risky behavior are more common in adolescence, there are considerable cross-cultural differences. Adolescents in traditional cultures tend to maintain traditional values and practices—even those experiencing the rapid pace of modernization and globalization. Moreover, there are considerable individual differences in behavioral and mood disruptions among adolescents (Arnett, 1999).

Despite the normal conflicts between parental values and adolescent behaviors, most adolescents have positive relations with their parents. In general, adolescence is a time of only slightly increased parent-child conflict. Though the emotional intensity of parent-child conflicts is somewhat higher at puberty, the rate of parent-child conflict declines over the adolescent years (Laursen, Coy, & Collins, 1998) as both adolescents and their parents adopt more positive conflict resolution styles (Van Doom, Branje, & Meeus, 2011).

Adolescents' increasing autonomy and involvement with their peers often leads to disagreements with their parents about family obligations. For example, Jean Phinney and Anthony Ong assessed beliefs about family obligations in a large sample of Vietnamese-American and European-American adolescents and their parents. Regardless of socioeconomic status or cultural background, disagreement over family obligations was negatively correlated with the adolescent participants' life satisfaction (Phinney & Ong, 2003). Conflicts also may be more frequent among first-generation immigrants and their children due to differential rates of acculturation within the family. Compared to non-immigrant families, immigrant Armenian, Vietnamese, and Mexican parents were more likely to stress family obligations than their children. Moreover, among immigrant families, intergenerational discrepancies in familial values increased as a function of time spent living in the United States (Phinney, Ong, & Madden, 2000).

In regard to their friendships, adolescents have more intimate friendships than do younger children, possibly because they are more capable of sharing their thoughts and feelings and understanding those of others. Adolescents who fail to develop intimate friendships are especially prone to loneliness. In fact, adolescent friendships are more important than relationships with family members in preventing loneliness (Ciftci Uruk & Demir, 2003). Though the level of intimate feelings expressed by boys and girls when interacting with their same-sex friends does not differ, there are gender differences in the

ways adolescents establish and experience intimate friendships. Adolescent girls tend to establish intimacy through self-disclosure and discussion, whereas adolescent boys tend to establish intimacy through shared activities (McNelles & Connolly, 1999).

Adolescence is associated with an important biologically based psychosocial conflict between the powerful urge to engage in sexual relations and societal values against pre-marital sex. The proportion of sexually active American adolescents increased steadily from the 1930s, when less than 10 percent had premarital sex, to today, when most older adolescents engage in it. But the sexes differ in their sexual attitudes. Male adolescents are more willing to engage in casual sex, whereas female adolescents are more likely to prefer sex as part of a committed relationship, though this gender difference is not large and gender similarities in sexual attitudes have increased over time (Petersen & Hyde, 2010; also see Chapter 11).

Psychologists recently have begun correcting the one-dimensional view of adolescent erotic relationships as consisting solely of sexual behavior. More researchers are focusing on the nature of adolescent romance, not just sexual behavior, including parental influences and changes in the nature of adolescent romance (Furman, 2002). A study of over 200 college students found that the quality of their romantic relationships was related to the nature of their relationships with their parents. Students who felt a low degree of trust, communication, and closeness in their relationships with their parents tended to feel devalued, disrespected, and emotionally controlled by their current romantic partner. Moreover, students who were unhappy in their current romantic relationship reported that their past relationships with their parents were marked by frequent, intense, and poorly resolved conflicts. A key factor moderating the relationship between their past negative relationships with their parents and their current romantic relationships was the expectation that their romantic partner would ultimately reject them. Such a pessimistic expectation may lead individuals to engage in behaviors that harm their romantic relationships (Gray, 2001).

Adolescence also is a period often involving experimentation with, or chronic use of, psychoactive drugs, including alcohol, nicotine, cocaine, and marijuana. Adolescent drug use, such as smoking, is influenced more by peers than by parents (Bauman, Carver, & Gleiter, 2001). But parental involvement, including monitoring their children's behavior, can help counter the possibility of the adolescent's being initiated into smoking by peers (Simons-Morton, 2002). The importance of avoiding unwise use of psychoactive drugs is highlighted by the association of adolescent smoking and drug use with risky sexual behavior, particularly engaging in sexual intercourse without using a condom (Wu, Witkiewitz, McMahon, & Dodge, 2010).

Drug use also has a negative effect on academic performance. A survey of more than 18,000 American adolescents assessed the relationship between using cigarettes, marijuana, alcohol, and cocaine and academic achievement. The main factors related to poor academic achievement were smoking cigarettes, getting drunk, and being under the influence of alcohol while at school. Cocaine use had a negligible relationship to academic achievement, perhaps because few adolescents reported being under the influence of cocaine while at school (Jeynes, 2002). Today, alcohol is the main drug of choice among adolescents in many countries. A survey of more than 2,600 Canadian adolescents found that alcohol use was associated with more problem behaviors than was the use of other drugs (Gfellner & Hundleby, 1994). Fortunately, despite the risks associated with sexual irresponsibility and drug and alcohol abuse, almost all adolescents enter adulthood relatively unscathed.

Section Review: Adolescent Development

1. Why should adolescence researchers be concerned with cohort effects?

2. What is the formal operational stage?

3. According to Erikson, how does identity formation manifest itself in adolescents?

Adult Development

adulthood The period beginning when the individual assumes responsibility for her or his own life.

In Western cultures, **adulthood** begins when adolescents become independent of their parents and assume responsibility for themselves. Interest in adult development accelerated in the 1950s after being inspired by Erikson's theory of life-span development (Levinson, 1986) and brought an increased realization that physical, cognitive, and psychosocial changes take place across the entire life span.

Physical Development

Adults reach their physical peak in their late twenties and then begin a slow physical decline that does not accelerate appreciably until old age. Most athletes peak in their twenties, as is shown by the ages at which world-class athletes achieve their best performances (Schulz & Curnow, 1988). Beginning in our twenties, our basal metabolic rate (the rate at which the body burns calories when at rest) also decreases, accounting in part for the tendency to gain weight in adulthood. This makes it especially important for adults to pay attention to diet and exercise, which are associated with healthier cardiovascular functioning in middle age and old age (Sawatzky & Naimark, 2002). Physical exercise also is associated with better cognitive functioning in old age (Colcombe & Kramer, 2003). Of course, one must be careful not to presume that exercise *causes* improved cardiovascular or cognitive functioning. Perhaps, for example, having a healthier cardiovascular system or good cognitive functioning makes individuals more likely to exercise.

menopause The cessation of menstruation, usually occurring between the ages of 40 and 55.

The aging process is marked by hormonal changes in women and men. Typically, women experience **menopause**—the cessation of their menstrual cycle between the ages of 40 and 55. This is associated with a reduction in estrogen secretion, cessation of ovulation, and consequently the inability to become pregnant. The reduction in estrogen can cause sweating, hot flashes, and brittle bones, as well as atrophy of the vaginal tissue, uterus, and mammary glands (Freedman, 2002). Typically, men experience **andropause**—a gradual decline of testosterone after the age of 40. As testosterone levels decline, men produce fewer and fewer sperm and experience changes in their sexual response, such as slower erections and delayed or less frequent orgasms. However, they still can father children into old age (Morley, 2001).

andropause The gradual decline of testosterone experienced by men after the age of 40.

Midlife hormonal changes do not signal an end to sexuality. Postmenopausal women still have fulfilling sex lives and social lives. A survey of 16,000 American women from five ethnic groups (European American, African American, Japanese American, Chinese American, and Latino) found that women's attitudes toward menopause were neutral to positive and that health status, not menopausal status, predicted the happiness of women in midlife (Sommer et al., 1999). Attitudes toward menopause, however, can vary by culture and social class. For example, one cross-cultural study found that French women generally reported positive attitudes toward menopause. However, Tunisian women, especially poor Tunisian women, reported more negative attitudes and physical symptoms than the French (Delanoë et al., 2012). Moreover, though the prevalence of erectile dysfunction does increase with age, many older men have satisfying sex lives. One large survey of more than 1,000 men aged 58 to 94 years found that positive sexual attitudes, good health, and a responsive sexual partner were associated with continued sexual activity (Bortz, Wallace, & Wiley, 1999).

Middle-aged adults tend to become farsighted and require reading glasses, as evidenced by an increasing tendency to hold books and newspapers at arm's length. But marked changes in physical abilities usually do not occur until late adulthood. The older adult exhibits deterioration in heart output, lung capacity, reaction time, muscular strength, and motor coordination (Maranto, 1984). Old age also brings a decline in hearing, particularly of high-pitched sounds.

Eventually, no matter how well we take care of our bodies, all of us reach the ultimate physical change—death. Though the upper limit of the human life span seems to be about 120 years, few people live to even 100 years of age. But why is death inevitable? Death seems to be genetically programmed into our cells by limiting their ability to repair

or reproduce themselves (Hayflick, 1980). Animal research indicates that aging can be slowed by the reduction of daily caloric intake, which prevents the buildup of certain metabolic by-products that promote aging. For example, a study of rats found that those who ate a low-calorie diet lived longer (Masoro, Shimokawa, Higami, & McMahan, 1995). The effects of low-calorie diets on human aging and longevity remain unclear, but ongoing research with human participants suggests that there are positive benefits in reducing caloric intake (Roth & Polotsky, 2012). Longevity also is influenced by physical activity. One longitudinal study of 70-year-old residents of western Jerusalem found that mortality rates were significantly lower for participants who reported engaging in regular exercise. Moreover, walking as little as four hours per week was linked to increased survival in this sample (Stessman, Maaravi, Hammerman-Rozenberg, & Cohen, 2000).

We do know, however, that the mere act of continuing to work is associated with slower aging. In a study supporting this, elderly people who continued to work or who retired but participated in regular physical activities showed a constant level of cerebral blood flow over a 4-year period. In contrast, elderly retirees who did not participate in regular physical activities showed a significant decline in cerebral blood flow. Those who continued to work also scored better on cognitive tests than did the inactive retirees (Rogers, Meyer, & Mortel, 1990). One 30-year longitudinal study found that adults who were employed in occupations that required complex work—requiring thought and independent decision making—demonstrated higher levels of intellectual functioning compared to adults who were employed in less demanding occupations. Moreover, the beneficial effect of complex work was more pronounced in late adulthood compared to young adulthood (Schooler, Mulatu, & Oates, 1999). There is even evidence that individuals who engage in complex activities can generate new synapses in the brain, partly countering some of the negative effects of aging (Black, Isaacs, & Greenough, 1991). Thus, whereas physical aging is inevitable, people who maintain an active lifestyle might age at a slower rate. Note that these results do not conclusively demonstrate that activity causes a slowing of the effects of aging. Perhaps, instead, people who age more slowly are more likely to stay active.

Aging and Physical Health

These adults show that diet and exercise can contribute to a healthy old age.
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Cognitive Development

One of the most controversial issues in developmental psychology is the pattern of adult cognitive development, particularly intellectual development. Early studies showed that we experience a steady decline in intelligence across adulthood. But this apparent decline is found more often in cross-sectional studies than in longitudinal studies. Longitudinal studies have found that a marked decline in intelligence does not begin until about age 60. This indicates that the decline in intelligence across adulthood found in cross-sectional studies might be a cohort effect (perhaps due to differences in early educational experiences) rather than an aging effect (Schaie & Hertzog, 1983). Moreover, the intellectual decline in old age does not encompass all facets of intelligence. Instead, it holds for fluid intelligence but not for crystallized intelligence (Ryan, Sattler, & Lopez, 2000). **Fluid intelligence** reflects the ability to reason and to process information; **crystallized intelligence** reflects the ability to gain and retain knowledge.

But what accounts for the decline in fluid intelligence in old age? The Seattle Longitudinal Study of 1,620 adults between 22 and 91 years of age conducted by K. Warner Schaie (1989) found that the speed of information processing slows in old age. This has been replicated in other research studies (Zimprich & Martin, 2002). This slowing is especially detrimental to short-term memory (Salthouse, 1991), which is the stage of memory that involves the conscious, purposeful mental manipulation of information. But the decline in fluid intelligence can be slowed. The Seattle Longitudinal Study found that a group of older adults who were given cognitive training did not show the same decline in fluid intelligence shown by older adults who were not given such training (Saczynski, 2002).

Older adults tend to do more poorly than adolescents and young adults on cognitive tasks. One factor that explains why is that they have been out of school for many years. This was the finding of a study that compared the recall ability of college students of

fluid intelligence The form of intelligence that reflects reasoning ability, memory capacity, and speed of information processing.

crystallized intelligence The form of intelligence that reflects knowledge acquired through schooling and in everyday life.

Are There Significant Psychological Gender Differences?

In the 19th century, scientific interest in gender differences was stimulated by Darwin's theory of evolution and promoted by Francis Galton, whose views were influenced by sexist attitudes of the Victorian era (Buss, 1976). Galton assumed that women and men had evolved physical and psychological differences that help them function in particular roles, and he insisted that they should remain in those roles (Shields, 1975). As discussed in Chapter 10, views like his were countered by some psychologists, such as Leta Stetter Hollingworth (1886–1939), who insisted that gender differences were due to social factors and did not denote the inferiority of women.

The first major review of gender differences was published by Eleanor Maccoby and Carol Jacklin (1974). They reported that women were superior in verbal abilities and men were superior in spatial and mathematical abilities. They also found that men were more aggressive than women. Nonetheless, they found fewer differences, and generally smaller differences, than were commonly believed to exist. Today, researchers who study gender differences are particularly concerned with cognitive abilities and psychosocial variables. Many of these researchers have used the statistical technique meta-analysis, which enables them to assess the size of gender differences and situational or sociocultural factors that influence these effect sizes (see Chapter 2).

Cognitive Abilities

In studying cognitive differences between women and men, researchers have studied differences primarily in three kinds of abilities. They ask, Are there gender differences in verbal abilities? spatial abilities? mathematical abilities?

Verbal Abilities

Research on children supports the popular belief in the verbal superiority of girls and women. Girls tend to be superior to boys in speaking, spelling, vocabulary, and reading comprehension. Yet the size of these differences decreases by adolescence. Overall, gender differences in verbal abilities have declined in size in recent decades until they are virtually negligible (Hyde & Plant, 1995). But what about talkativeness, which the popular stereotype holds to be the province of women? Research indicates that, contrary to the stereotype, men are consistently more talkative than women (Hyde & Linn, 1988).

Spatial Abilities

Research has tended to consistently find a large gender difference in one test of spatial abilities. Men are superior in the rotation of mental images (Hyde, Fennema, & Lamon, 1990). Gender differences in other spatial abilities, though, tend to be smaller and inconsistent. Moreover, a meta-analysis of research studies of gender differences in spatial abilities found that the sizes of the differences have decreased in recent years (Voyer, Voyer, & Bryden, 1995). However, gender differences in spatial abilities are observed in early childhood (Levine, Huttenlocher, Taylor, & Langrock, 1999) and in many nonlaboratory settings. For example, when providing directions, women are more likely to rely upon landmarks, whereas men are more likely to refer to north-south-east-west strategies (Halpern & LeMay, 2000). A recent study revealed, though, that gender differences also may be influenced by regional differences. In the Midwest and Western United States and in regions characterized by a grid-like pattern of roads, *both* men and women were more likely to refer to compass or left-right directions (Lawton, 2001). Thus, social experiences can influence spatial abilities.

Mathematical Abilities

Perhaps the most strongly established cognitive gender difference is that adolescent and adult men have higher average scores than adolescent and adult women on standardized mathematics tests. A national talent search by Camilla Benbow and Julian Stanley (1983) found that among seventh- and eighth-graders who took the mathematics subtest of the Scholastic Aptitude Test (SAT), the average score for boys was higher than the average score for girls. In fact, among those scoring higher than 700 (out of 800), boys outnumbered girls by a ratio of 13 to 1. Could this be attributable to boys having more experience in mathematics? Benbow and Stanley say no, having found little difference in the number of mathematics courses taken by females and males. And because they found no other life experiences that could explain their findings, Benbow and Stanley concluded that heredity probably accounts for the difference. This explanation has received some support from other researchers (Thomas, 1993).

But it has also provoked controversy. Critics argue that the gender differences in mathematical abilities reported by Benbow and Stanley might be attributable to as yet unidentified differences in girls' and boys' experiences with mathematics. Also, boys do not have a higher average score than girls on all measures of mathematical ability. Though boys have higher average scores on mathematics achievement tests, which stress problem solving, girls receive higher grades in mathematics courses (Halpern, 2000). A recent meta-analysis of 242 studies published between 1997 and

Are There Significant Psychological Gender Differences? *continued*

2007 based upon more than 1,200,000 participants found, overall, no gender differences in mathematical performance (Lindberg, Hyde, Peterson, & Linn, 2010).

It also is important to consider that gender differences in mathematics achievement are smaller than cross-cultural or ethnic differences in achievement (Kimball, 1995). In fact, the greatest gender difference in mathematics ability is found among European American samples (Hyde, Fennema, & Lamon, 1990). In cultures with comparatively smaller gender differences, parents are more likely to encourage academic achievement and advanced study in mathematics—for both sons and daughters (Hanna, Kundiger, & Larouche, 1990). Moreover, gender differences in mathematics are larger in countries where women do not share economic, social, and political power with men (Else-Quest, Hyde, & Linn, 2010).

As discussed in Chapter 17, people's beliefs about group differences may lead to a self-fulfilling prophecy, which ultimately influences their behavior. And research has shown that women's and men's beliefs about gender and ethnic differences can affect their performance on mathematics tests (Smith & White, 2002). Thus, stereotypes about women's and men's cognitive abilities may contribute to gender differences in mathematics achievement.

Psychosocial Variables

Researchers also study gender differences in psychosocial behavior. They have been especially concerned with differences in personality and aggression.

Personality

Meta-analyses of research studies on personality differences have found that men are more assertive where-as women are slightly more extraverted ($d = -.14$) and more anxious, trusting, and, especially, tender-minded (that is, more caring and nurturing). These differences tended to be consistent across all ages and educational levels of participants, as well as across a variety of different cultures (Feingold, 1994). A recent meta-analysis found that male participants score slightly higher on standardized measures of self-esteem than do female participants. The size of this small gender difference does increase—at least temporarily—in adolescence (Kling, Hyde, Showers, & Buswell, 1999). And a recent meta-analysis (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006) found that girls score much higher on measures of self-control than do boys ($d = -1.01$), whereas there is a moderate gender difference favoring boys on factors related to rough-and-tumble play, such as activity level ($d = .30$) and the intensity of their emotional experiences ($d = .33$).

Gender Differences and Similarities

Physiological and sociocultural factors play an important role in girls' and boys' cognitive abilities.
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Are There Significant Psychological Gender Differences?   *continued*

Researchers also have studied a variety of other personality variables with the use of meta-analysis. For example, do women reveal more of their private thoughts, feelings, and experiences than men do? Contrary to popular belief, women are only marginally more likely to self-disclose than men are (Dindia & Allen, 1992). But consistent with popular views, males are slightly more likely than females to take risks across a variety of situations (Byrnes, Miller, & Shafer, 1999) and women and girls are slightly more able than men and boys to delay gratification (Silverman, 2003). But what of the popular belief that women are more empathetic than men? This apparent gender difference depends on how empathy is measured. When asked to report on their level of empathy, women score higher than men. But when empathy is measured by physiological arousal or overt behavior, gender differences disappear. Evidently, social expectations that women will be more emotionally sensitive than men create differences in their subjective views of themselves but not necessarily in their actual behavior or physiological responses (Eisenberg & Lennon, 1983). This hypothesis was tested in a recent meta-analysis that found women's empathy scores were higher than men's only when participants were aware that their empathy was being assessed. This gender difference disappeared in experimental situations that lacked this demand characteristic (Ickes, Gesn, & Graham, 2000).

One recent study provided more evidence of gender similarities in basic values. Over 11,000 participants were surveyed in eight cultures (Chinese East Asia, Eastern Europe, Finland, France, Israel, Japan, Latin America, and the United States). Whereas some cross-cultural differences were found, results indicated that there were no consistent gender differences in the meaning of personal values across cultures (Struch, Schwartz, & van der Kloot, 2002).

Aggression
Just as women are reputed to be more empathetic than men, men are reputed to be more aggressive than women. Research has found that men are somewhat more physically aggressive than are women (Eagly & Steffen, 1986). Moreover, gender differences in aggression might be the product of gender roles. This was the conclusion of a study in which male and female participants were tested in the laboratory. When they were singled out as individuals, men were more aggressive than women. When they were deindividuated (that is, made to feel anonymous), men and women did not differ in aggression. The researchers attributed this difference to the power of gender roles: When we feel that

we are being noticed, we behave according to gender expectations (Lightdale & Prentice, 1994). Moreover, as discussed in Chapter 17, when operational definitions of aggression are broadened to include behaviors that are more stereotypically female—such as indirect aggression—gender differences in aggression are minimized.

Explanations for Possible Gender Differences
If psychological gender differences exist, what might account for them? Researchers point to physiological factors and sociocultural factors.

Physiological Factors
Because of the obvious physical differences between men and women, researchers have looked to physiological factors to explain psychological gender differences. David Buss believes that men and women inherit certain behavioral tendencies as a product of their long evolutionary history. According to Buss, "Men and women differ . . . in domains in which they have faced different adaptive problems over human evolutionary history. In all other domains, the sexes are predicted to be psychologically similar" (Buss, 1995, p. 164). Thus, men are more aggressive and women more nurturing because prehistoric males were more likely to be hunters and prehistoric females were more likely to be caregivers. They do not differ in traits unrelated to their prehistoric roles as males and females.

But how might heredity affect psychological gender differences? Evidence supporting the biological basis of gender differences in social behavior implicates hormonal factors. Girls whose adrenal glands secrete high prenatal levels of testosterone are more likely to become "tomboys" who prefer rough play and masculine activities (though most tomboys do not have this adrenal disorder). These girls' genitals look more similar to those of boys at birth (though they are usually modified by surgery), and this might make parents treat them as though they were boys, yet parents usually report that they treat these girls the same as parents treat girls without the disorder (Berenbaum & Hines, 1992). There is some evidence, though, for a hormonal basis for cognitive gender differences (Kimura & Hampson, 1994). There also is evidence of a hormonal basis for gender differences in play behavior in childhood and fairly strong evidence for its influence on gender differences in physical aggression (Collaer & Hines, 1995).

A second way that heredity might affect gender differences is through brain development. But efforts to associate specific cognitive differences with differences in brain structures have produced mixed results. As

Are There Significant Psychological Gender Differences? *continued*

discussed in Chapter 3, some studies have found that men's brains may be more lateralized than women's brains. Studies of people with brain damage have found that damage to men's left cerebral hemisphere is associated with impaired verbal skills, and damage to men's right cerebral hemisphere is associated with impaired nonverbal skills. In contrast, women's verbal and non-verbal skills do not seem to be influenced by the side of the brain damaged (Springer & Deutsch, 1998). Other studies, though, have failed to find gender differences in hemispheric lateralization (e.g., Snow & Sheese, 1985). And there are large individual differences in brain organization; biological sex is only one of many variables influencing brain organization (Kimura, 1987).

Sociocultural Factors

The possibility that gender differences in cognitive abilities are influenced more by sociocultural factors than by physiological factors is supported by studies that have found a narrowing of gender differences in cognitive abilities between North American male and female participants during the past 40 years (Hyde & Plant, 1995; Lindberg, Hyde, Peterson, & Linn, 2010). This might be explained in part by the cultural trend to provide girls and boys with somewhat more similar treatment and opportunities (Jacklin, 1989). Even Camilla Benbow (1988) agrees that environmental, as well as hereditary, factors play an important role in cognitive abilities such as mathematics. For example, minimal gender differences have been found among participants from the study of Mathematically Precocious Youth who had gone on to graduate study in math and sciences. The profiles of female and male participants included attributes that are critical to achieving excellence in these fields—exceptional quantitative abilities, scientific interests and values, and persistence in seeking out educational opportunities (Lubinski, Benbow, Shea, Eftekhari-Sanjani, & Halvorson, 2001).

After decades of extensive research, no gender differences have emerged that are large enough to predict with confidence how individual men and women will behave (Deaux, 1985). This has provoked a controversy about whether we should continue to study gender differences. Some psychologists, such as Roy Baumeister (1988), argue that we should no longer study them. Why study differences that are too few or too small to have practical significance? And why study gender differences when reports of even small differences might support sex discrimination? But Baumeister's view was countered by gender difference researchers Alice Eagly (1995) and Diane Halpern (1994), who believe that objective scientific research on gender differences should continue, even if it might find differences that some people would prefer did not exist.

A compromise position has been put forth by Janet Shibley Hyde, who favors studying gender differences but warns against relying on the results of studies that have not been replicated, interpreting gender differences as signs of female deficiencies, and automatically attributing such differences to inherited biological factors. She favors acknowledging the fact that gender similarities are the rule and that the few gender differences that have been found can be attributed primarily to sociocultural factors (Hyde, 2007).

traditional age, their peers not attending college, and older people not attending college. The average age of the younger groups was 22, and the average age of the older group was 69. The three groups were equal in their level of intelligence.

The results showed that the recall ability of the college group was better than that of the other two groups. But there was no difference in the performance of the groups of older persons and younger persons who were not attending college. This indicates that it might be the failure to use one's memory, rather than simply brain deterioration accompanying aging, that accounts for the inferior performance of the elderly on tests of recall. When it comes to the maintenance of cognitive abilities, such as memory, the adage "Use it or lose it" might have some validity (Hultsch, Hertzog, Small, & Dixon, 1999). One of the more intriguing longitudinal studies of cognitive aging and Alzheimer's disease is the Nun Study, which has involved following a large sample of Catholic religious sisters for more than 60 years—through the deaths of many of them (Santa Cruz et al., 2011).

Psychosocial Development

Social development continues through early, middle, and late adulthood. Keeping in mind that these divisions are somewhat arbitrary, assume that early adulthood extends from age 20 to age 40, middle adulthood from age 40 to age 65, and late adulthood from age 65

on. The similarities exhibited by people within these periods are related to the common social experiences of the "social clock." In recent decades, the typical ages at which some of these experiences occur have varied more than in the past. A graduate student might live at home with his parents until his late twenties, a woman working toward her medical degree might postpone marriage until her early thirties, and a two-career couple might not have their first child until they are in their late thirties. Of course, events that are unique to each person's life can also play a role in psychosocial development. Chance encounters in our lives, for example, contribute to our unique development (Bandura, 1982). You might reflect on chance encounters that influenced your choice of an academic major or that helped you meet your current boyfriend, girlfriend, husband, or wife.

Early Adulthood

Though Sigmund Freud paid little attention to adult development, he did note that normal adulthood is marked by the ability to love and to work. Erik Erikson agreed that the capacity for love is an important aspect of early adulthood, and he claimed that the first major task of adulthood is facing the conflict of **intimacy versus isolation**. Intimate relationships involve a strong sense of emotional attachment and personal commitment. The Rochester Adult Longitudinal study of a community sample supported Erikson's belief that the development of the capacity for intimacy depends on the successful formation of a psychosocial identity in adolescence. The achievement of identity during adolescence contributed to the development of intimacy in young adulthood. Participants who were capable of developing both identity in adolescence and a high degree of intimacy in young adulthood reported more successful romantic relationships and greater life satisfaction in midlife (Sneed, Whitbourne, Schwartz, & Huang, 2012).

intimacy versus isolation
Erikson's developmental stage in which success is achieved by establishing a relationship with a strong sense of emotional attachment and personal commitment.

Establishing Intimate Relationships About 95 percent of young adults eventually experience the intimate relationship of marriage. Of course there is a variety of family arrangements. And at any given time many adults are unmarried—they are either widowed, divorced, not ready, or committed to remaining single. However, the results of a longitudinal study of six countries (Austria, Germany, the Netherlands, Great Britain, Ireland, and the United States) found that men's and women's attitudes are shifting away from the norms of traditional marriage. Participants reported a remarkable diversity of lifestyles and individual differences in the timing of marriage and parenthood (Gubernskay, 2010).

A strong and consistent positive correlation has been found between marriage and psychological well-being. The World Values Survey, a survey of 159,169 adults in 42 countries, found that married women and men reported higher levels of life satisfaction than cohabiting couples, single adults, and divorced or separated adults. Though there were

significant cross-cultural differences, these differences were negligible. And men and women derive similar benefits from marriage (Diener, Gohm, Suh, & Oishi, 2000). These results recently have been replicated in nationally representative samples from Australia, Germany, and Great Britain (Luhmann, Lucas, Eid, & Diener, 2013). Unmarried status is correlated with greater physical and psychological risks, especially for men. A survey of more than 18,000 men conducted in England found that unmarried middle-aged men of all kinds—single, widowed, divorced, or separated—had higher mortality rates than did married men (Ben-Shlomo, Smith, Shipley, & Marmot, 1993). One reason for this is a lower risk of illness in the married, especially if their partner is responsive to their needs (Selcuk & Ong, 2013).

What characteristics do adults look for in potential mates? As you might expect, both women and men tend to seek partners who are kind, loyal, honest, considerate, intelligent, interesting, and affectionate. But men tend to be more concerned than women with the potential spouse's physical attractiveness, and women tend to be more concerned than men with the potential spouse's earning capacity (Buss et al., 1990). As discussed in Chapter 17, psychologists argue whether these preferences reflect the influence of evolution or of cultural norms that differentially affect men's and women's marital expectations.

What determines whether a relationship will succeed? An important factor is similarity—in age, religion, attitudes, ethnicity, personality, intelligence, and educational level (O'Leary & Smith, 1991). Willingness to talk about problems is another important factor, as found in a 2-year longitudinal study of newlyweds. Those couples who believed that conflicts should be discussed openly reported greater marital happiness than those who believed they should be ignored (Crohan, 1992). A 4-year longitudinal study found that high-quality, positive communication between couples was associated with higher levels of marital satisfaction. Moreover, marital dissolution was associated with marital conflict and aggression—especially if present early in the marriage (Rogge & Bradbury, 1999).

Communication is essential to marital satisfaction. One study examined videotapes of 78 married or cohabiting couples discussing a conflict they were having. Positive interruptions (agreement with what the partner was saying) were positively correlated with the couples' feelings about the conversation and their relationship satisfaction. Negative interruptions (disagreement with what the partner was saying) were negatively correlated with the couples' feelings about the conversation and their relationship satisfaction (Daigen & Holmes, 2000). Research indicates that marital satisfaction is greater when partners take a collaborative approach to resolving conflicts than when one or both take a competitive approach (Greeff & de Bruyne, 2000).

Dissolving Intimate Relationships Unfortunately, for many couples, happiness is elusive, and they may eventually seek to end their relationship. In the United States, about half of first marriages are so unhappy that they end in divorce. In fact, the United States has the highest divorce rate of any industrialized country (O'Leary & Smith, 1991). A study that interviewed over 1,300 persons found that divorce has increased not because marriages were happier in the "good old days," but instead because barriers to divorce (such as conservative values or shared social networks) have fallen and alternatives to divorce (such as a wife's independent income or remarriage prospects) have increased. Thus, the threshold of marital happiness that will trigger divorce is lower than it was several decades ago.

The barriers to relationship dissolution associated with marriage are important in understanding the higher rate of relationship dissolution among gay and lesbian couples. One study compared relationship satisfaction and dissolution rates among heterosexual, gay, and lesbian couples. Heterosexual married couples' satisfaction with their relationship was similar to that reported by cohabiting gay and lesbian couples. Whereas relationship satisfaction declined among all three groups, gay and lesbian couples were more likely to have ended their relationships over the 5 years of the study. These results are attributed to the fact that gay and lesbian couples perceived fewer barriers to ending their relationship—for example, the cost of divorce or the loss of insurance or health benefits (Kurdek, 1998).

There are a variety of specific factors that contribute to divorce. One of the hallmarks of an unhappy marriage is the tendency of spouses to consistently offer negative explanations for their spouse's behavior (Karney & Bradbury, 2000). In dual-wage-earner marriages, perceived inequality in doing housework—particularly by wives—appears to contribute to divorces (Frisco & Williams, 2003). And even the nature of commitment may predict relationship dissolution. Couples who display avoidant commitment (that is, those who want to avoid the negative consequences of breaking up) are more likely than committed couples who display approach commitment (that is, those who want to retain the positive consequences of staying together) to break up (Frank & Brandstaetter, 2002).

Yet there is evidence that people might remain committed to spouses or partners who treat them poorly. You probably have known someone who sticks with a romantic partner who treats that person in a manner that you would not tolerate. Consider a study of 86 pairs of married couples from central Texas, with an average age of 32 years and an average length of marriage of 6 years (Swann, Hixon, & De La Ronde, 1992). The spouses took personality tests measuring their self-concepts. They also measured how the spouses appraised each other and how committed they were to each other. The results revealed that the degree of commitment to one's spouse depended on the degree of congruence between one's self-concept and how one was viewed by one's spouse. That is, those with positive self-concepts felt more committed when their spouses viewed them positively. Likewise, those with negative self-concepts felt more committed when their spouses viewed them negatively.

What could account for this finding, which runs counter to the commonsense notion that we all wish to be admired and treated well? The researchers found that though we might insist on being treated well in casual relationships, we insist on being treated in accordance with our self-concept within the intimacy of marriage. That is, we want our spouses to verify our self-concept so we are not confused about ourselves or about how other people will treat us. In addition, we will trust spouses more who do not try to "snow" us by telling us we're attractive when we feel ugly, intelligent when we feel stupid, and personally appealing when we feel socially inept. Moreover, whereas people with positive self-concepts might welcome high expectations of them, people with negative self-concepts might fear unrealistically high expectations that they could not meet.

Parenthood For most couples, parenthood is a major component of marriage. Raising children can be one of the greatest rewards in life, but it can also be one of life's greatest stresses. Because women still tend to be the primary caregiver, their parental responsibilities tend to be especially stressful. But couples who share childcare responsibilities are more likely to successfully weather the stress of becoming new parents (Belsky & Hsieh, 1998). Overall, parents who live with their biological children show greater declines in marital happiness over time than do married, childless couples or married couples living with stepchildren (Kurdek, 1999). Of course, some couples remain childless. They are not necessarily unhappy. In fact, especially if they are voluntarily childless, they might be as happy as couples with children. This is attributable, in part, to the fact that they do not have the stress that parents experience from money woes, children's illnesses, loss of sleep, and lack of recreational outlets. Women who are childless by choice show higher levels of psychological well-being than women who are involuntarily childless (Jeffries & Konnert, 2002).

But what of single parents? In the 1960s and 1970s, divorce was the chief cause of single parenting. This has been joined by planned or unplanned childbearing outside of marriage. Though single parents are usually women, one in five is male. Many single parents, given social and financial support, are successful in rearing children. For example, one study of single parents serving in the U.S. military found that mothers and fathers readily used social, financial, and organizational resources to balance their family and work obligations (Heath & Orthner, 1999). But according to the U.S. Bureau of the Census, single-parent families, on the average, suffer disadvantages in regard to income, health, and housing conditions. The most disadvantaged are families consisting of children and a never-married mother (Bianchi, 1995).

Middle Adulthood

In 1850 few Americans lived beyond what we now call early adulthood; the average life span was only 40 years (Shneidman, 1987). But improved nutrition, sanitation, and health care have almost doubled that life span. What was the end of the life span more than a century ago is today simply the beginning of middle adulthood. Daniel Levinson (1978) found that during the transition to middle adulthood, men commonly experience a midlife crisis, in which they realize that the "dream" they had pursued in regard to their life goals will not be achieved or, even if achieved, will seem transient in the face of the inevitability of death. Other studies indicate, however, that the midlife crisis is less intense than Levinson found in his research (Fagan & Ayers, 1982). Moreover, the life dreams of women tend to be more complex than the life dreams of men. Whereas men typically focus on their careers, women focus on marriage and children, as well as their careers (Kittrell, 1998).

According to Erik Erikson, the main task of middle adulthood is the resolution of the conflict of **generativity versus stagnation**. Those who achieve generativity become less self-absorbed and more concerned about being a productive worker, spouse, and parent (Slater, 2003). They are more competent, continue to strive for achievement, and are more altruistic and trusting (Cox, Wilt, Olson, & McAdams, 2010). They also are more satisfied with their lives (McAdams, de St. Aubin, & Logan, 1993). One way of achieving generativity is to serve as a mentor for a younger person. This lets mentors realize their life dreams vicariously and know that their dreams will continue even after their own deaths (Westermeyer, 2004).

Middle adulthood also brings transitions affected by one's parental status. You might be surprised to learn that parents become more distressed and experience more marital unhappiness after their first child leaves home than after their last child leaves home. In fact, after the last child has left home, parents tend to be relieved and experience improved marital relations (Harris, Ellicott, & Holmes, 1986). Perhaps the notion of an "empty nest syndrome" (after the last child has left home) should be replaced by the notion of a "partly empty nest syndrome" (after the first child has left home). Moreover, a growing trend in North America is the "revolving-door nest," caused by the return home of young adults who find it personally or financially difficult to live on their own (Dennerstein, Dudley, & Guthrie, 2002).

Late Adulthood

Now that more people in developed countries are living into their 70s and beyond, developmental psychologists have become more interested in studying late adulthood. In 1900 only one person in thirty was over 65. By 2020 one person in five will be over 65 (Eisdorfer, 1983). Though this increase in the elderly population, including many more retired people, will create more concern about physical well-being in old age, it also will create more concern about psychosocial development in old age. Research has provided inconsistent findings regarding whether retirement generally has positive, negative, or no effects on psychological well-being (Kim & Moen, 2001).

Erikson claimed that the main psychosocial task of late adulthood is to resolve the crisis of **integrity versus despair**. A sense of integrity results from reflecting back on a meaningful life through a "life review." In fact, Erikson claimed that pleasurable reminiscing is essential to satisfactory adjustment in old age. This was supported by a study of nursing home residents aged 70 to 88 years. Participants in the experimental group received a visitor who encouraged them to reminisce and engage in a life review. Participants in the control group received a friendly visit. Participants who engaged in a life review scored higher on a questionnaire that measured their level of ego integrity, as long as 3 years after the intervention (Haight, Michel, & Hendrix, 2000). Older adults who are able to review and accept their past are more likely to develop a sense of coherence and experience more positive psychological development (Wiesmann & Hannich, 2011).

And old age is not necessarily a time of physical decay, cognitive deterioration, and social isolation. For many, it is a time of physical activity, continued education, and

Generativity

According to Erik Erikson, people who successfully resolve the midlife conflict of generativity versus stagnation become less self-absorbed and more concerned with the well-being of the next generation.
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generativity versus stagnation
Erikson's developmental stage in which success is achieved by becoming less self-absorbed and more concerned with the well-being of others.

integrity versus despair
Erikson's developmental stage in which success is achieved by reflecting back on one's life and finding that it has been meaningful.

rewarding social relations (Whitbourne & Hulicka, 1990). Many elderly adults optimize their cognitive and physical functioning by capitalizing on their strengths and compensating for their weaknesses. For example, they may allot more time to perform tasks, practice old skills, or learn new skills. The use of these strategies by elderly adults has been found to be associated with successful aging, characterized by more positive emotions, enhanced feelings of well-being, and less loneliness (Freund & Baltes, 1998).

Eventually, many adults must confront one of the greatest psychosocial challenges of old age—the death of a mate. During the period immediately following the death of their spouse, bereaved spouses are more likely to suffer depression, illness, or death than are their peers with living spouses. An increase in morbidity, mortality, and psychological well-being tends to be found among surviving spouses. This might stem from the loss of the emotional and practical support previously provided by the now-deceased spouse. One study tested this hypothesis with a sample of recently bereaved spouses. Widowers were more likely to experience greater deterioration in physical and mental health and receive less social support than were widows. However, there was no evidence that the loss of social support reported by widowers mediated this gender difference (Stroebe, Stroebe, & Abakoumkin, 1999). Thus, it is likely that other factors contribute to the poorer health and negative psychological outcomes experienced by bereaved widowers. For example, a study of older German adults found that widowers tend to be lonelier than widows (Pinquart, 2003). A variety of techniques have been used to aid the bereavement process, with varying success (Durland, 2000). In one study, 44 college students who had lost a loved one were randomly assigned to write about either their bereavement experience or about a trivial, unrelated topic. The results indicated that writing about one's bereavement experience helped reduce feelings of distress (Range, Kovac, & Marion, 2000). Similar findings were reported in a study in which college students wrote about their bereavement experience regarding a loved one who had committed suicide in the prior two years (Kovac & Range, 2000).

Though, as Benjamin Franklin observed in 1789, "in this world nothing's certain but death and taxes," we can at least improve the way in which we confront our own mortality. In old age, successful resolution of the crisis of ego integrity versus despair is associated with less fear of death (Goebel & Boeck, 1987). And a survey of 200 adults found that those with strong religious convictions and a greater belief in an afterlife have lower death anxiety (Alvarado, Templer, Bresler, & Thomas-Dobson, 1995).

Prior to the 20th century, death was accepted as a public part of life. People died at home, surrounded and comforted by loved ones. Today, people commonly die alone, in pain, in hospital rooms, attached to life-support systems. One of the most important developments to counter this approach to death and dying is the **hospice movement**, founded in 1958 by the British physician Cicely Saunders. She was motivated to do so by her colleagues' failure to respond sensitively to dying patients and their families. Hospices provide humane, comprehensive care for the dying patient in a hospital, residential, or home setting, with attention to alleviating the patient's physical, emotional, and spiritual suffering (Saunders, 1996). A study comparing hospices to traditional nursing homes found that elderly dying cancer patients received more effective pain relief and better quality of life during their time spent in hospice (Black et al., 2011).

hospice movement The providing of care for the dying patient with attention to alleviating the patient's physical, emotional, and spiritual suffering.

Section Review: Adult Development

1. What is the apparent relationship between caloric intake and aging?
2. What does research indicate about changes in intelligence in old age?
3. How do adults successfully resolve Erikson's conflict involving generativity versus stagnation?

An Analysis of Children's Toys

Rationale

As discussed in this chapter, children as young as toddlers learn to classify toys as masculine or feminine. In fact, toys are examples of how social and cultural factors influence gender-role development. In this exercise you will examine a selection of toys, observe any gender-specific messages or gender typing, and discuss your work in the context of what you learned from reading this chapter.

Procedure

Find a local toy store that has a well-stocked selection of toys for boys and girls of different ages. Before you make your trip, consider the ways that gender typing may be reflected in a toy's attributes. For example, you might consider colors of the toys or pictures of children playing with the toys on packaging materials. Other factors to consider might be indicators that toys are for girls or boys. Some packages might indicate that the toy is appropriate for boys of a certain age range. Or, the store might group toys that girls would be interested in together.

Spend about an hour in the store, examining the toys, their packaging, and their placement in the store and make notes of any evidence of gender typing. Summarize your findings by answering the following questions:

1. Could you find toys that were easily identifiable as boys' toys? What types of toys? What type of play or activities do they encourage?

2. Could you find toys that were easily identifiable as girls' toys? What types of toys? What type of play or activities do they encourage?

3. Could you find any gender-neutral toys—that is toys, that were neither boys' nor girls' toys? What types of toys? What type of play or activities do they encourage?

Results and Discussion

Describe your findings. Did you find evidence of gender typing during your observation? As discussed in the chapter, cultural trends have indicated more similar treatment of boys and girls. Do your results support what you read in the chapter? Were there any other conclusions you reached after summarizing your observations?

Chapter Summary

Research Methods in Developmental Psychology

- Developmental psychology is the field that studies the physical, perceptual, cognitive, and psychosocial changes that take place across the life span.
- Research designs typical of developmental psychology include longitudinal research, cross-sectional research, and cohort-sequential research.

Prenatal Development

- The prenatal period is divided into the germinal, embryonic, and fetal stages.
- Cell-adhesion molecules direct the size, shape, and location of organs in the embryo.
- Teratogens can impair prenatal development.
- Women who drink alcohol, a teratogen, during pregnancy might have offspring who suffer from fetal alcohol syndrome.

Infant and Child Development

- Childhood extends from birth until puberty.
- The first 2 years of childhood are called infancy.
- Motor development follows a consistent sequence, though the timing of motor milestones varies somewhat among infants.

- Jean Piaget found that children pass through distinct cognitive stages of development.
- During the sensorimotor stage, the infant learns to coordinate sensory experiences and motor behavior, and forms schemas that represent aspects of the world.
- The preoperational stage is marked by egocentrism. In the concrete operational stage, the child learns to make transitive inferences and to appreciate conservation.
- Erik Erikson put forth an influential theory of psychosocial development. He believed that the life span consists of eight distinct stages, each associated with a crisis that must be overcome.
- An important factor in infant development is social attachment, a strong emotional relationship between an infant and a caregiver.
- Permissive and authoritarian child-rearing practices are less effective than authoritative ones.
- Children who receive high-quality day care do not appear to suffer ill effects from being separated from their parents, though this might not be true of infants.
- Research on the effects of divorce on children has produced inconsistent results, with some studies finding

- no effects, others finding negative effects, and still others finding positive effects.
- Though the causes of gender-role development are still unclear, social learning theory and gender-schema theory try to explain it.
- The most influential theory of moral development has been Lawrence Kohlberg's cognitive-developmental theory, which is based on Piaget's belief that a person's level of moral development depends on his or her level of cognitive development.
- Kohlberg proposes that we pass through preconventional, conventional, and postconventional levels of moral development.
- Carol Gilligan argues that Kohlberg's theory is biased toward a masculine view of morality. Research has provided mixed support for Kohlberg's theory.

Adolescent Development

- Adolescence is a transitional period between childhood and adulthood that begins with puberty.
- In regard to physical development, the adolescent experiences the maturation of primary and secondary sex characteristics.
- In regard to cognitive development, some adolescents enter Piaget's formal operational stage, meaning that they can engage in abstract, hypothetical reasoning.
- And, in regard to psychosocial development, adolescence is a time of identity formation, an important stage in Erik Erikson's theory of development.
- The adolescent also is increasingly influenced by peer values, especially in regard to fashion, sexuality, and drug use.
- Research on sex differences has found no consistent differences in male and female brains.
- Girls and boys differ little in their gross motor abilities until puberty, when boys begin to outperform girls.
- Women tend to have better verbal abilities, while men tend to have better spatial and mathematical problem-solving abilities.
- Men also tend to be more physically aggressive than women.

- Research on gender differences is controversial because of fears that its findings might be used to promote and legitimate discrimination.
- Gender differences are based on group averages, and most are so small that they should not be used to make decisions about individuals.

Adult Development

- Adulthood begins when adolescents become independent from their parents.
- In regard to physical development, adults reach their physical peak in their late twenties, at which point they begin a gradual decline that does not accelerate appreciably until old age.
- Middle-aged women experience menopause, which, contrary to popular belief, is rarely a traumatic event, and middle-aged men experience andropause.
- In regard to cognitive development, though aging brings some slowing of cognitive processes, people who continue to be mentally active show less cognitive decline than do their peers who do not stay active.
- In regard to social development, Erik Erikson saw the main task of early adulthood as the establishment of intimacy, typically between a husband and wife. About 95 percent of adults marry, but half of North American marriages will end in divorce.
- The most successful marriages are those in which the spouses discuss, rather than avoid, marital issues.
- Erikson saw the main task of middle adulthood as the establishment of a sense of generativity, which is promoted by parenting.
- After the last child leaves home, parents typically improve their emotional and marital well-being.
- Erikson saw the final stage of life as ideally promoting a sense of integrity in reflecting on a life well lived.
- Eventually, all people must face their own mortality.
- The hospice movement, founded by Cicely Saunders, has promoted more humane, personal, and homelike care for the dying patient.

Key Terms

developmental psychology (p. 108)
maturation (p. 108)

Research Methods in Developmental Psychology

cohort (p. 109)
cohort-sequential research (p. 109)
cross-sectional research (p. 109)
longitudinal research (p. 108)

Prenatal Development

embryonic stage (p. 110)
fetal alcohol syndrome (p. 112)
fetal stage (p. 111)
germinal stage (p. 110)
teratogen (p. 111)

Infant and Child Development

accommodation (p. 115)

assimilation (p. 115)
authoritative parenting (p. 122)
autonomy versus shame and doubt (p. 121)
childhood (p. 112)
concrete operational stage (p. 117)
conservation (p. 117)
conventional level (p. 127)
egocentrism (p. 117)

Chapter Quiz

Note: Answers for the Chapter Quiz questions are provided at the end of the book.

1. A child who first believes that changing the form of something changes its amount, but eventually realizes that changing the form of something does not change its amount, would be exhibiting
   a. assimilation.
   b. accommodation.
   c. transitive inference.
   d. transductive reasoning.

2. In regard to the pubertal growth spurt,
   a. boys and girls typically show a spurt at about the same age.
   b. boys typically show a spurt about two years earlier than girls.
   c. girls typically show a spurt about two years earlier than boys.
   d. boys and girls a century ago typically showed a spurt several years earlier than boys and girls today.

3. A junior high school student shows excellent ability in designing and conducting experiments to test basic principles regarding the movement of objects. The student has probably reached what Piaget called the
   a. sensorimotor stage.
   b. preoperational stage.
   c. formal operational stage.
   d. concrete operational stage.

4. An important reason that adults tend to put on weight is that
   a. their appetite tends to increase.
   b. their basal metabolic rate slows.
   c. they reduce their secretion of insulin.
   d. they increase their secretion of insulin.

5. According to Erikson, the main psychosocial conflict of adolescence involves
   a. intimacy versus isolation.
   b. industry versus inferiority.
   c. identity versus role confusion.
   d. generativity versus stagnation.

6. A child who realizes that pouring all of the soda from a short, wide glass into a tall, narrow glass does not change the amount of soda is exhibiting an appreciation of
   a. object permanence.
   b. conservation.
   c. transitive inference.
   d. transductive reasoning.

7. Mary Ainsworth has contributed to our knowledge of infant
   a. social attachment.
   b. cognitive abilities.
   c. physical maturation.
   d. perceptual development.

8. Elderly persons would be most likely to show a decline in fluid intelligence if, for example, they
   a. lost the ability to swim.
   b. forgot the names of old friends.
   c. could no longer solve algebra problems.
   d. could no longer form new memories of daily events.

9. The "visual cliff" is used to test infant
   a. visual acuity.
   b. depth perception.
   c. movement detection.
   d. balance and coordination.

10. The sperm normally fertilizes the egg in the
    a. ovary.
    b. vagina.
    c. uterus.
    d. fallopian tube.

11. According to Diana Baumrind, authoritative parents
    a. prohibit "back talk."
    b. often rely on physical punishment.
    c. explain the reasons for their rules.
    d. often have children who become juvenile delinquents.

12. According to Sigmund Freud, resolution of the Oedipus and Electra complexes influences the development of
    a. weaning.
    b. gender roles.
    c. aggressiveness.
    d. social attachment.

13. In regard to moral development, Gilligan believes that girls and women
    a. favor justice more than caring.
    b. favor caring more than justice.
    c. favor caring and justice equally.
    d. are superior to males as children but not as adults.

14. According to Jean Piaget, assimilation and accommodation determine the infant's
    a. schemas.
    b. sensory acuity.
    c. motor maturation.
    d. social attachment.

15. A psychologist compares the language ability of a group of 12-month-olds, a group of 15-month-olds, and a group of 18-month-olds. This is an example of
    a. longitudinal research.
    b. cross-sectional research.
    c. cohort-sequential research.
    d. quasi-experimental research.

16. Research indicates that divorce has increased in the United States because
    a. barriers to divorce have fallen.
    b. marriages were happier in the past.
    c. children have become more burdensome.
    d. the age of first marriages continues to decline.

17. Jim is older than Phil. Susan is younger than Phil. A child who correctly concludes that Jim is older than Susan would be exhibiting
    a. conservation.
    b. transitive inference.
    c. preoperational thought.
    d. transductive reasoning.

18. According to Kohlberg, students who do not cheat on exams because they fear the teacher will punish them are at the
    a. concrete level of moral development.
    b. conventional level of moral development.
    c. preconventional level of moral development.
    d. postconventional level of moral development.

19. Teratogens
    a. may cause prenatal defects.
    b. guide embryonic development.
    c. depend on the individual's genotype.
    d. do not have effects until the last three months before birth.

20. According to Erikson the main conflict of old age is
    a. integrity versus despair.
    b. intimacy versus isolation.
    c. industry versus inferiority.
    d. generativity versus stagnation.

21. The average infant walks at age
    a. 5 months.
    b. 9 months.
    c. 13 months.
    d. 18 months.

22. The sequential unfolding of inherited predispositions is called
    a. eugenics.
    b. phylogeny.
    c. maturation.
    d. predeterminism.

23. In regard to gender differences in empathy, on the average,
    a. women report they are more empathetic than do men.
    b. women behave more empathetically than men.
    c. women show physiological changes indicating that they are more empathetic than men.
    d. men and women are equally empathetic on all measures of empathy.

24. The fact that college students who experienced the "Reagan revolution" of the 1980s might differ from those who experienced the "Woodstock era" of the 1960s may limit a psychologist to making only tentative conclusions about the psychological development of college students. This limitation would be most likely to affect the conclusions drawn from
    a. longitudinal research.
    b. cross-sectional research.
    c. naturalistic observation.
    d. quasi-experimental research.

Thought Questions

1. How would you use a longitudinal research design, a cross-sectional research design, and a cohort-sequential research design to study whether college students become more tolerant of ethnic groups that are not their own between their admission to college and their senior year?

2. A child insists on going out to play without first doing his homework. How might parents respond differently in using authoritarian parenting, permissive parenting, and authoritative parenting?

3. What are some of the major biological and sociocultural factors that contribute to the development of gender differences?

4. How might an adult successfully meet each of the last three crises in Erikson's theory of psychosocial development?