

Unit IX

Developmental Psychology

PD Unit Overview

We are who we are because we develop. From the time of our conception to our last breath, we are developing—physically growing and changing, cognitively maturing, and socially interacting. Development is marvelously complex, and it cannot be explained in simple ways, no matter how hard we try. In this unit, major issues in development are discussed: whether nature or nurture is more important to development; whether we develop in stages or in a continuous process; whether our personalities stay the same or change significantly as we grow. None of these issues has a simple answer. If any of them did, this unit wouldn't need 10 modules to explain it all!

This unit explains development using both a chronological and thematic approach. Generally, the modules move from infancy to adulthood, highlighting the major milestones of each epoch of life. At times, modules diverge to delve deeper into significant issues—gender development, parental and peer influence, and sexual development. These different approaches to development demonstrate how development is not a simple process of growing from one stage to the next: It is an interaction of genetics, time, and experience that molds us into who we are. After reading this unit, students will be able to:

- Identify and explain the 3 issues that have influenced understanding of life-span development.
- Chart the course of prenatal development, explaining factors that affect it.
- Explain how brain development occurs during infancy and childhood.
- Compare and contrast the theories of Piaget, Kohlberg, and Vygotsky related to cognitive development.
- Discuss how parents and infants bond and develop attachment.
- Explain how temperament, parenting styles, abuse, family disruption, day care, and neglect affect attachment.
- Discuss how self-concepts develop.
- Analyze gender similarities and differences in relation to aggression, social power, and social connectedness.
- Evaluate how gender roles and gender typing influence development.
- Evaluate the influence of peers and parents on development.
- Identify the physical development that signals adolescence.
- Discuss the social tasks and challenges of adolescence.
- Identify emerging adulthood.
- Identify how biological sex is determined and influenced by development.
- Identify how sexually transmitted diseases can be prevented.
- Discuss the research regarding sexual orientation.
- Identify the physical and cognitive changes that occur during adulthood.
- Trace social development in adults.

Alignment to AP[®] Course Description

Topic 9: Developmental Psychology (7–9% of AP[®] Examination)

Module	Topic	Essential Questions
Module 45	Developmental Psychology's Major Issues	<ul style="list-style-type: none">• What is the relative contribution of nature and nurture to our lives?• Does development occur in stages or as a continuous flow from one level to another?• As we develop, do we generally stay the same or do we experience significant change?
	Prenatal Development and the Newborn	<ul style="list-style-type: none">• What are some important factors to healthy prenatal and newborn development?
Module 46	Brain Development	<ul style="list-style-type: none">• What can parents do to help their children use their brain to aid in its development?
	Motor Development	<ul style="list-style-type: none">• If infants experience milestones in the same sequence, but not the same timing, what does that tell us about human development?
	Brain Maturation and Infant Memory	<ul style="list-style-type: none">• How important are our earliest memories and experience on our current lives?

Module	Topic	Essential Questions
Module 47	Piaget's Theory and Current Thinking	<ul style="list-style-type: none"> Why is Piaget's theory so important?
	An Alternative Viewpoint: Lev Vygotsky's Scaffolding	<ul style="list-style-type: none"> Why is Vygotsky's theory important to our understanding of development?
	Reflecting on Piaget's Theory	<ul style="list-style-type: none"> What important points can we learn from Piaget and Vygotsky?
Module 48	Origins of Attachment	<ul style="list-style-type: none"> Why is becoming attached to someone else important?
	Attachment Differences: Temperament and Parenting	<ul style="list-style-type: none"> How do temperament and parenting influence our development?
	Deprivation of Attachment	<ul style="list-style-type: none"> How influential can deprivation of attachment be to a person?
	Day Care	<ul style="list-style-type: none"> What qualities should people look for in a day care?
	Self-Concept	<ul style="list-style-type: none"> How is self-concept different from self-esteem?
	Parenting Styles	<ul style="list-style-type: none"> What factors about parenting influence future behavior in children?
	Culture and Child Raising	<ul style="list-style-type: none"> How do child-raising practices vary between cultures?
Module 49	How Are We Alike? How Do We Differ?	<ul style="list-style-type: none"> How do people of different genders handle situations in similar ways? How do people of different genders handle situations in different ways? Are these differences important?
	The Nurture of Gender: Our Culture	<ul style="list-style-type: none"> How much influence does culture have on your gender role?
Module 50	Parents and Early Experiences	<ul style="list-style-type: none"> How much credit or blame do parents deserve for their children's behavior and life outcomes?
	Peer Influence	<ul style="list-style-type: none"> How do peers influence your gender role?
Module 51	Cognitive Development	<ul style="list-style-type: none"> How do adolescents think differently from children and adults?
Module 52	Forming an Identity	<ul style="list-style-type: none"> How does one form an identity? How important is it for adolescents to form an identity?
	Parent and Peer Relationships	<ul style="list-style-type: none"> Who has more influence on a person's behavior and choices: parents or peers?
	Emerging Adulthood	<ul style="list-style-type: none"> Is the development of emerging adulthood a good or bad thing?
Module 53	Sexual Orientation	<ul style="list-style-type: none"> What has research taught us about sexual orientation?
Module 54	Physical Development	<ul style="list-style-type: none"> Is adulthood only a time of physical deterioration?
	Cognitive Development	<ul style="list-style-type: none"> How do adults change cognitively as they age?
	Social Development	<ul style="list-style-type: none"> Do adults have a social life? How is it similar and different from an adolescent's social life?

Unit Resources

Module 45

STUDENT ACTIVITY

- Fact or Falsehood?

FLIP IT VIDEO

- Teratogens

Module 46

STUDENT ACTIVITIES

- Fact or Falsehood?
- Identifying Developmental Landmarks

FLIP IT VIDEO

- Major Developmental Milestones

Module 47

TEACHER DEMONSTRATIONS

- Lollipops and Gloquex
- Demonstrating Preoperational Thought

STUDENT ACTIVITIES

- Fact or Falsehood?
- Musk Lifesavers
- Intellectual Development
- Conservation and Jelly Beans
- Formal Operational Thought
- Physical Development

FLIP IT VIDEO

- Schemas, Assimilation, and Accommodation

Module 48

STUDENT ACTIVITIES

- Fact or Falsehood?
- Social Development
- Temperament on the Web
- EAS Temperament Survey
- Parental Authority Questionnaire

FLIP IT VIDEO

- Attachment Styles and Parenting

Module 49

STUDENT ACTIVITY

- Fact or Falsehood?

Module 50

STUDENT ACTIVITY

- Fact or Falsehood?

Module 51

STUDENT ACTIVITIES

- Fact or Falsehood?
- Introducing Adolescent Development
- Explaining Morality Using Kohlberg

FLIP IT VIDEO

- Adolescent Moral Development

Module 52

STUDENT ACTIVITIES

- Fact or Falsehood?
- The Objective Measure of Ego Identity Status (OM-EIS)
- A Generation Gap?
- Interviewing About Adolescence

FLIP IT VIDEO

- Adolescent Identity Development

Module 53

STUDENT ACTIVITIES

- Fact or Falsehood?
- Writing About Puberty

Module 54

STUDENT ACTIVITIES

- Fact or Falsehood?
- Growing Old
- Perceptions of Old Age
- Birthday Cards and Aging
- Writing Letters to Parents and Children
- Your Lot in Life
- Attitudes Toward the Elderly
- Writing a Biography
- Life-span Development
- The Medical Directive
- The Bucket List



Unit IX

Developmental Psychology

Modules

- 45** Developmental Issues, Prenatal Development, and the Newborn
- 46** Infancy and Childhood: Physical Development
- 47** Infancy and Childhood: Cognitive Development
- 48** Infancy and Childhood: Social Development
- 49** Gender Development
- 50** Parents, Peers, and Early Experiences
- 51** Adolescence: Physical and Cognitive Development
- 52** Adolescence: Social Development and Emerging Adulthood
- 53** Sexual Development
- 54** Adulthood: Physical, Cognitive, and Social Development



Life is a journey, from womb to tomb. So it is for me, and so it will be for you. My story, and yours, began when a man and a woman together contributed 20,000+ genes to an egg that became a unique person. Those genes coded the protein building blocks that, with astonishing precision, formed our bodies and predisposed our traits. My grandmother bequeathed to my mother a rare hearing loss pattern, which she, in turn, gave to me (the least of her gifts). My father was an amiable extravert, and sometimes I forget to stop talking. As a child, my talking was impeded by painful stuttering, for which Seattle Public Schools gave me speech therapy.

Along with my parents' nature, I also received their nurture. Like you, I was born into a particular family and culture, with its own way of viewing the world. My values have been shaped by a family culture filled with talking and laughter, by

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Pacing Guide

Module	Topic	Standard Schedule Days	Block Schedule Days
Module 45	Developmental Psychology's Major Issues Prenatal Development and the Newborn	2	1
Module 46	Brain Development Brain Maturation and Infant Memory		
Module 47	Piaget's Theory and Current Thinking An Alternative Viewpoint: Lev Vygotsky's Scaffolding Reflecting on Piaget's Theory	1	
Module 48	Origins of Attachment Attachment Differences: Temperament and Parenting Deprivation of Attachment Day Care Self-Concept Parenting Styles Culture and Child Raising	1	1

a religious culture that speaks of love and justice, and by an academic culture that encourages critical thinking (asking, What do you mean? How do you know?).

We are formed by our genes, and by our contexts, so our stories will differ. But in many ways we are each like nearly everyone else on Earth. Being human, you and I have a need to belong. My mental video library, which began after age 4, is filled with scenes of social attachment. Over time, my attachments to parents loosened as peer friendships grew. After lacking confidence to date in high school, I fell in love with a college classmate and married at age 20. Natural selection disposes us to survive and perpetuate our genes. Sure enough, two years later a child entered our lives, and I experienced a new form of love that surprised me with its intensity.

But life is marked by change. That child now lives 2000 miles away, and one of his two siblings has found her calling in South Africa. The tight rubber bands linking parent and child have loosened, as yours likely have as well.

Change also marks most vocational lives, which for me transitioned from a teen working in the family insurance agency, to a premed chemistry major and hospital aide, to (after discarding my half-completed medical school applications) a psychology professor and author. I predict that in 10 years you, too, will be doing things you do not currently anticipate.

Stability also marks our development: We experience a continuous self. When I look in the mirror, I do not see the person I once was, but I feel like the person I have always been. I am the same person who, as a late teen, played basketball and discovered love. A half-century later, I still play basketball and still love (with less passion but more security) the life partner with whom I have shared life's griefs and joys.

Continuity morphs through stages—growing up, raising children, enjoying a career, and, eventually, life's final stage, which will demand my presence. As I wend my way through this cycle of life and death, I am mindful that life is a journey, a continuing process of development, seeded by nature and shaped by nurture, animated by love and focused by work, begun with wide-eyed curiosity and completed, for those blessed to live to a good old age, with peace and never-ending hope.

Module	Topic	Standard Schedule Days	Block Schedule Days
Module 49	How Are We Alike? How Do We Differ? The Nurture of Gender: Our Culture	1	1/2
Module 50	Parents and Early Experiences Peer Influence		
Module 51	Cognitive Development	1	1
Module 52	Forming an Identity Parent and Peer Relationships Emerging Adulthood		
Module 53	Sexual Orientation		
Module 54	Physical Development Cognitive Development Social Development	1	

TEACH**TRM Discussion Starter**

Use the Module 45 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

ENGAGE**Applying Science**

Consider assigning students to conduct developmental research using case studies. They can conduct in-depth interviews and observe interactions with people experiencing developmental milestones—young children (ages 3–6 years old), adolescents (both older and younger than your students), or older adults (age 65 and older). Students can present their cases using a variety of methods, including video, scrapbooks, or PowerPoint® presentations.

Module 45

Developmental Issues, Prenatal Development, and the Newborn

Module Learning Objectives

- 45-1** Identify three issues that have engaged developmental psychologists.
- 45-2** Discuss the course of prenatal development, and explain how teratogens affect that development.
- 45-3** Describe some abilities of the newborn, noting how researchers are able to identify their mental abilities.



developmental psychology a branch of psychology that studies physical, cognitive, and social change throughout the life span.

AP® Exam Tip

All three of these issues are important for development. Nature and nurture, of course, weaves its way through almost every module. It is one of the topics most likely to be on the AP® exam.

"Nature is all that a man brings with him into the world; nurture is every influence that affects him after his birth." —FRANCIS GALTON, *ENGLISH MEN OF SCIENCE*, 1874

Developmental Psychology's Major Issues

45-1 What three issues have engaged developmental psychologists?

Developmental psychology examines our physical, cognitive, and social development across the life span, with a focus on three major issues:

1. *Nature and nurture*: How does our genetic inheritance (our *nature*) interact with our experiences (our *nurture*) to influence our development?
2. *Continuity and stages*: What parts of development are gradual and continuous, like riding an escalator? What parts change abruptly in separate stages, like climbing rungs on a ladder?
3. *Stability and change*: Which of our traits persist through life? How do we change as we age?

Let's reflect now on these three development issues.

Nature and Nurture

The gene combination created when our mother's egg engulfed our father's sperm helped form us, as individuals. Genes predispose both our shared humanity and our individual differences.

But it is also true that our experiences form us. In the womb, in our families, and in our peer social relationships, we learn ways of thinking and acting. Even differences initiated by our nature may be amplified by our nurture. We are not formed by either nature or nurture, but by their interrelationships—their *interaction*. Biological, psychological, and social-cultural forces interact.

Mindful of how others differ from us, however, we often fail to notice the similarities stemming from our shared biology. Regardless of our culture, we humans share the same life cycle. We speak to our infants in similar ways and respond similarly to their coos and cries (Bornstein et al., 1992a,b). All over the world, the children of warm and supportive parents feel better about themselves and are less hostile than are the children of punishing and rejecting parents (Rohner, 1986; Scott et al., 1991). Although ethnic groups differ in school achievement and delinquency, the differences are “no more than skin deep.” To the extent that family structure, peer influences, and parental education predict behavior in one of these ethnic groups, they do so for the others as well. Compared with the person-to-person differences within groups, the differences between groups are small.

Continuity and Stages

Do adults differ from infants as a giant redwood differs from its seedling—a difference created by gradual, cumulative growth? Or do they differ as a butterfly differs from a caterpillar—a difference of distinct stages?

Generally speaking, researchers who emphasize experience and learning see development as a slow, continuous shaping process. Those who emphasize biological maturation tend to see development as a sequence of genetically predisposed stages or steps: Although progress through the various stages may be quick or slow, everyone passes through the stages in the same order.

Are there clear-cut stages of psychological development, as there are physical stages such as walking before running? The stage theories of Jean Piaget on cognitive development, Lawrence Kohlberg on moral development, and Erik Erikson on psychosocial development propose that such stages do exist (as summarized in **FIGURE 45.1**). But some research casts doubt on the idea that life proceeds through neatly defined, age-linked stages. Young children have some abilities Piaget attributed to later stages. Kohlberg’s work reflected a worldview characteristic of individualist cultures and emphasized thinking over acting. And adult life does not progress through a fixed, predictable series of steps. Chance events can influence us in ways we would never have predicted.

Nevertheless, the concept of *stage* remains useful. The human brain does experience growth spurts during childhood and puberty that correspond roughly to Piaget’s stages (Thatcher et al., 1987). And stage theories contribute a developmental perspective on the whole life span, by suggesting how people of one age think and act differently when they arrive at a later age.

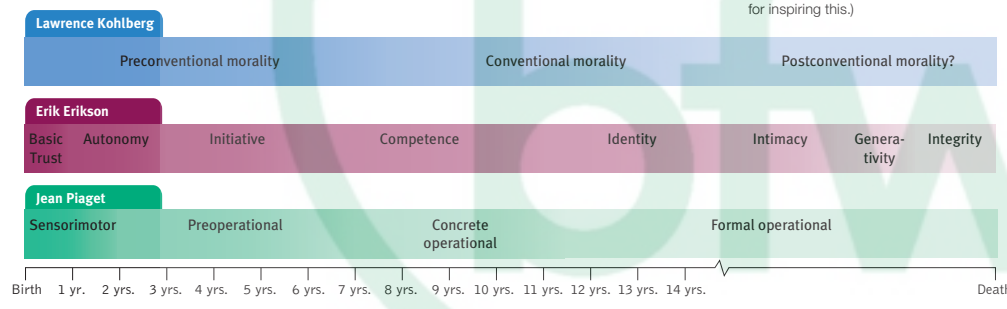


Stages of the life cycle

FYI

Another stage theory, Sigmund Freud’s ideas about how personality develops, is discussed in Unit X.

Figure 45.1
Comparing the stage theories (With thanks to Dr. Sandra Gibbs, Muskegon Community College, for inspiring this.)



ENGAGE

Critical Questions

In the book *The Nurture Assumption*, Judith Rich Harris proposed that parents do not have as much influence on the development of their children as people generally believe. In his book *The Blank Slate: The Modern Denial of Human Nature*, Steven Pinker also argues that infants are not born blank, but with a structure that influences how they behave and think.

Have students consider the following:

- How much of your behavior would you attribute to biology? How much to environment? Why?
- How would you feel if you knew that your genes had the greatest influence on your behavior? Why?

TEACH

Teaching Tip

Note that Figure 45.1 highlights the researchers students will study during this unit. Also note that development is a slow process, unfolding over the entire life span.

ENGAGE

Active Learning

Have students interview their parents, friends, or teachers who knew them when they were younger to see if they have changed since elementary school. Have them consider asking the following questions:

- How would you describe my personality then and now?
- What did I want to be when I was younger?
- What music did I like to listen to? What was my favorite book or TV show?
- How did I spend most of my free time?

Have the students reflect on whether they are more different or more similar than they are now.

Smiles predict marital stability

In one study of 306 college alumni, one in four with yearbook expressions like the one on the left later divorced, as did only 1 in 20 with smiles like the one on the right (Hertenstein et al., 2009).

Tom Piroep/Shutterstock



PhotoDisc/Getty Images



"At 70, I would say the advantage is that you take life more calmly. You know that 'this, too, shall pass!'" —ELEANOR ROOSEVELT, 1954

Stability and Change

As we follow lives through time, do we find more evidence for stability or change? If reunited with a long-lost grade-school friend, do we instantly realize that "it's the same old Andy"? Or do people we befriend during one period of life seem like strangers at a later period? (At least one acquaintance of mine would choose the second option. He failed to recognize a former classmate at his 40-year college reunion. The aghast classmate pointed out that she was his long-ago first wife.)

Research reveals that we experience both stability and change. Some of our characteristics, such as *temperament* (our emotional reactivity and intensity), are very stable:

- One study followed 1000 3-year-old New Zealanders through time. It found that preschoolers who were low in conscientiousness and self-control were more vulnerable to ill health, substance abuse, arrest, and single parenthood by age 32 (Moffitt et al., 2011).
- Another study found that hyperactive, inattentive 5-year-olds required more teacher effort at age 12 (Houts et al., 2010).
- Another research team interviewed adults who, 40 years earlier, had their talkativeness, impulsiveness, and humility rated by their elementary school teachers (Nave et al., 2010). To a striking extent, the personalities persisted.

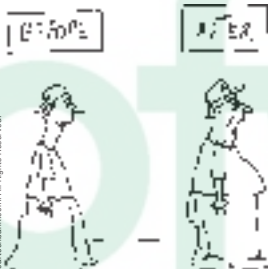
"As at 7, so at 70," says a Jewish proverb. The widest smilers in childhood and college photos are, years later, the ones most likely to enjoy enduring marriages (Hertenstein et al., 2009). While one in four of the weakest college smilers eventually divorced, only 1 in 20 of the widest smilers did so. As people grow older, personality gradually stabilizes (Ferguson, 2010; Hopwood et al., 2011; Kandler et al., 2010). The struggles of the present may be laying a foundation for a happier tomorrow.

We cannot, however, predict all of our eventual traits based on our early years of life (Kagan et al., 1978, 1998). Some traits, such as social attitudes, are much less stable than temperament, especially during the impressionable late adolescent years (Krosnick & Alwin, 1989; Moss & Susman, 1980). Older children and adolescents learn new ways of coping. Although delinquent children have elevated rates of later work problems, substance abuse, and crime, many confused and troubled children blossom into mature, successful adults (Moffitt et al., 2002; Roberts et al., 2001; Thomas & Chess, 1986). Happily for them, life is a process of becoming.

In some ways, we *all* change with age. Most shy, fearful toddlers begin opening up by age 4, and most people become more conscientious, stable, agreeable, and self-confident in the years after adolescence (Lucas & Donnellan, 2009; Roberts et al., 2003, 2006, 2008; Shaw et al., 2010). Many irresponsible 16-year-olds have matured into 40-year-old business or cultural leaders. (If you are the former, you aren't done yet.) Such changes can occur without changing a person's position *relative to others* of the same age. The hard-driving young adult may mellow by later life, yet still be a relatively driven senior citizen.

Life requires *both* stability and change. Stability provides our identity. It enables us to depend on others and be concerned about the healthy development of the children in our lives. Our trust in our ability to change gives us our hope for a brighter future. It motivates our concerns about present influences and lets us adapt and grow with experience.

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As adults grow older, there is continuity of self.

Before You Move On**▶ ASK YOURSELF**

Are you the same person you were as a preschooler? As an 8-year-old? As a 12-year-old? How are you different? How are you the same?

▶ TEST YOURSELF

What findings in psychology support the concept of stages in development and the idea of stability in personality across the life span? What findings challenge these ideas?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

AP® Exam Tip

Almost every topic in psychology holds personal relevance, but development stands out. As you work your way through this unit, think of how the material relates to you, your relatives, and your friends. The more often you do this, the easier it will be to remember the material.

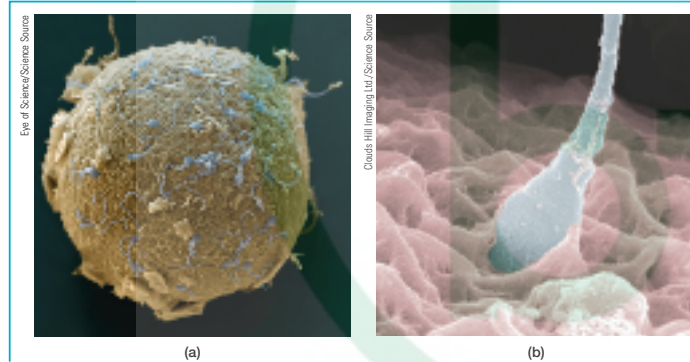
Prenatal Development and the Newborn

45-2 What is the course of prenatal development, and how do teratogens affect that development?

Conception

Nothing is more natural than a species reproducing itself. And nothing is more wondrous. With humans, the process starts when a woman's ovary releases a mature egg—a cell roughly the size of the period at the end of this sentence. The woman was born with all the immature eggs she would ever have, although only 1 in 5000 will ever mature and be released. A man, in contrast, begins producing sperm cells at puberty. For the rest of his life, 24 hours a day, he will be a nonstop sperm factory, with the rate of production—in the beginning more than 1000 sperm during the second it takes to read this phrase—slowing with age.

Like space voyagers approaching a huge planet, the 200 million or more deposited sperm begin their race upstream, approaching a cell 85,000 times their own size. The relatively few reaching the egg release digestive enzymes that eat away its protective coating (**FIGURE 45.2a**). As soon as one sperm penetrates that coating and is welcomed in (**Figure 45.2b**), the egg's surface blocks out the others. Before half a day elapses, the egg nucleus and the sperm nucleus fuse. The two have become one. Consider it your

**Figure 45.2****Life is sexually transmitted**

(a) Sperm cells surround an egg. (b) As one sperm penetrates the egg's jellylike outer coating, a series of chemical events begins that will cause sperm and egg to fuse into a single cell. If all goes well, that cell will subdivide again and again to emerge 9 months later as a 100-trillion-cell human being.

TEACH**Teaching Tip**

Fertility has become an important social issue in recent years, with more women postponing childbearing and new technologies emerging that address infertility. Explore the following ethical questions about fertility issues:

- Some women harvest their eggs to conceive later in life, building a career before having children. What are the pros and cons of having children later in life? What societal implications will this practice produce?
- What should become of unused frozen embryos? Explain the reasons behind your answer.
- Should human cloning be allowed? Why or why not?

ENGAGE**Enrichment**

According to the National Center for Health Statistics (2012), almost 50 more boys than girls are born per 1000 births each year in the United States. More infants were born in the month of September, and more infants were born on a Tuesday than any other day of the week.

Martin, J. A., Hamilton, B. E., Ventura, S. J., Osterman, M.J.K., Wilson, E. C., & Mathews, T. J. (2012). Births: Final data for 2010. *National vital statistics reports*, 61(1). Hyattsville, MD: National Center for Health Statistics.

ENGAGE**Active Learning**

Fertility technologies increase the likelihood of multiple fetuses developing in one pregnancy, resulting in famous births of multiples including the McCaughey sextuplets of Iowa, the Harris sextuplets of Alabama, the Gosselin sextuplets, and the Suleman octuplets. Research and discuss the following with students about multiple births:

- What advances in technology make it more likely that multiples can survive?
- What developmental problems can parents of multiples expect?
- What kind of community responses do parents of multiples receive?
- What ethical dilemmas do doctors and parents face with multiple fetuses developing in one pregnancy?

TEACH**Teaching Tip**

You may have students who are parents already. Encourage them to discuss their child-rearing practices and what it is like to be a teen parent so they can learn to be the best parents they can be, using psychological research as their guide.

ENGAGE**Active Learning**

If you are up for a lively discussion, you might organize a structured debate on any of the following issues related to prenatal development:

- When “life” begins
- Genetic testing of fetuses for abnormalities
- Human cloning
- Stem cell research

zygote the fertilized egg; it enters a 2-week period of rapid cell division and develops into an embryo.

embryo the developing human organism from about 2 weeks after fertilization through the second month.

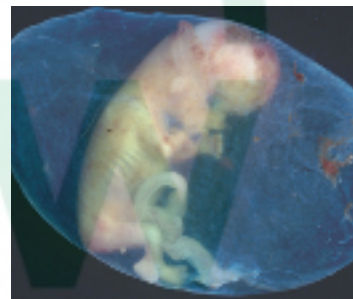
fetus the developing human organism from 9 weeks after conception to birth.

Figure 45.3

Prenatal development (a) The embryo grows and develops rapidly. At 40 days, the spine is visible and the arms and legs are beginning to grow. (b) By the end of the second month, when the fetal period begins, facial features, hands, and feet have formed. (c) As the fetus enters the fourth month, its 3 ounces could fit in the palm of your hand.



(a)



(b)



(c)

most fortunate of moments. Among 200 million sperm, the one needed to make you, in combination with that one particular egg, won the race. And so it was for innumerable generations before us. If any one of our ancestors had been conceived with a different sperm or egg, or died before conceiving, or not chanced to meet the partner or . . . the mind boggles at the improbable, unbroken chain of events that produced you and me.

Prenatal Development

Fewer than half of all fertilized eggs, called **zygotes**, survive beyond the first 2 weeks (Grobstein, 1979; Hall, 2004). But for you and me, good fortune prevailed. One cell became 2, then 4—each just like the first—until this cell division had produced some 100 identical cells within the first week. Then the cells began to differentiate—to specialize in structure and function. How identical cells do this—as if one decides “I’ll become a brain, you become intestines!”—is a puzzle that scientists are just beginning to solve.

About 10 days after conception, the zygote attaches to the mother’s uterine wall, beginning approximately 37 weeks of the closest human relationship. The zygote’s inner cells become the **embryo** (FIGURE 45.3a). The outer cells become the *placenta*, the life-link that transfers nutrients and oxygen from mother to embryo. A healthy and well-nourished mother helps form a healthy baby-to-be. Over the next 6 weeks, the embryo’s organs begin to form and function. The heart begins to beat.

For 1 in 270 sets of parents, though, there is a bonus. Two heartbeats will reveal that the zygote, during its early days of development, has split into two. If all goes well, two genetically identical babies will start life together some 8 months later (Module 14).

By 9 weeks after conception, an embryo looks unmistakably human (Figure 45.3b). It is now a **fetus** (Latin for “offspring” or “young one”). During the sixth month, organs such as the stomach have developed enough to give the fetus a good chance of survival if born prematurely.

At each prenatal stage, genetic and environmental factors affect our development. By the sixth month, microphone readings taken inside the uterus reveal that the fetus is responsive to sound and is exposed to the sound of its mother’s muffled voice (Ecklund-Flores, 1992; Hepper, 2005). Immediately after birth, emerging from living 38 or so weeks underwater, newborns prefer her voice to another woman’s or to their father’s (Busnel et al., 1992; DeCasper et al., 1984, 1986, 1994). They also prefer hearing their mother’s language. If she spoke two languages during pregnancy, they display interest in both (Byers-Heinlein et al., 2010). And just after birth, the melodic ups and downs of newborns’ cries bear the tuneful signature of their mother’s native tongue (Mampe et al., 2009). Babies born

ENGAGE**Enrichment**

Physical development in fetuses follows a specific pattern:

- 7 1/2 weeks: The fetus will flex its head away from stimulation around the mouth. By month’s end the ears begin to take shape.
- 12–15 weeks: Touch receptors around the mouth have developed. The fetus can grasp, frown, squint, and grimace. It may suck its thumb and swallow.
- 20–24 weeks: The senses of taste and smell have now formed. The fetus can feel movement and may respond to sound.
- 25–27 weeks: Some infants born prematurely can survive. Nerve supply to the ears is complete. Brain scans show response to touch and light.
- 32 weeks: The eyes open in the womb and the fetus may see its environment. Neural circuits are as advanced as a newborn’s. Brain scans show periods of deep sleep.

Ohnuma, K. (1987, July/August). Making senses. *Hippocrates*, p. 73.

to French-speaking mothers tend to cry with the rising intonation of French; babies born to German-speaking mothers cry with the falling tones of German. Would you have guessed? The learning of language begins in the womb.

In the 2 months before birth, fetuses demonstrate learning in other ways, as when they adapt to a vibrating, honking device placed on their mother's abdomen (Dirix et al., 2009). Like people who adapt to the sound of trains in their neighborhood, fetuses get used to the honking. Moreover, 4 weeks later, they recall the sound (as evidenced by their blasé response, compared with reactions of those not previously exposed).

Sounds are not the only stimuli fetuses are exposed to in the womb. In addition to transferring nutrients and oxygen from mother to fetus, the placenta screens out many harmful substances, but some slip by. **Teratogens**, agents such as viruses and drugs, can damage an embryo or fetus. This is one reason pregnant women are advised not to drink alcoholic beverages. A pregnant woman never drinks alone. As alcohol enters her bloodstream, and her fetus', it depresses activity in both their central nervous systems. Alcohol use during pregnancy may prime the woman's offspring to like alcohol and may put them at risk for heavy drinking and alcohol use disorder during their teens. In experiments, when pregnant rats drank alcohol, their young offspring later displayed a liking for alcohol's taste and odor (Youngtob et al., 2007, 2009).

Even light drinking or occasional binge drinking can affect the fetal brain (Braun, 1996; Ikonomidou et al., 2000; Sayal et al., 2009). Persistent heavy drinking puts the fetus at risk for birth defects and for future behavior problems, hyperactivity, and lower intelligence. For 1 in about 800 infants, the effects are visible as **fetal alcohol syndrome (FAS)**, marked by lifelong physical and mental brain abnormalities (May & Gossage, 2001). The fetal damage may occur because alcohol has an *epigenetic effect*: It leaves chemical marks on DNA that switch genes abnormally on or off (Liu et al., 2009).

The Competent Newborn

45-3 What are some newborn abilities, and how do researchers explore infants' mental abilities?

Babies come with software preloaded on their neural hard drives. Having survived prenatal hazards, we as newborns came equipped with automatic reflex responses ideally suited for our survival. We withdrew our limbs to escape pain. If a cloth over our face interfered with our breathing, we turned our head from side to side and swiped at it.

New parents are often in awe of the coordinated sequence of reflexes by which their baby gets food. Thanks to the *rooting reflex*, when something touches their cheek, babies turn toward that touch, open their mouth, and vigorously root for a nipple. Finding one, they automatically close on it and begin *sucking*—which itself requires a coordinated sequence of reflexive *tonguing*, *swallowing*, and *breathing*. Failing to find satisfaction, the hungry baby may cry—a behavior parents find highly unpleasant and very rewarding to relieve.



Prepared to feed and eat Animals are predisposed to respond to their offspring's cries for nourishment.

FYI

Prenatal development
zygote: conception to 2 weeks
embryo: 2 to 9 weeks
fetus: 9 weeks to birth

"You shall conceive and bear a son. So then drink no wine or strong drink." -JUDGES 13:7

teratogens (literally, "monster maker") agents, such as chemicals and viruses, that can reach the embryo or fetus during prenatal development and cause harm.

fetal alcohol syndrome (FAS) physical and cognitive abnormalities in children caused by a pregnant woman's heavy drinking. In severe cases, signs include a small, out-of-proportion head and abnormal facial features.

"I felt like a man trapped in a woman's body. Then I was born."
-COMEDIAN CHRIS BLISS

ENGAGE

Active Learning

Seventeen states can terminate parental rights if evidence of substance abuse exists during pregnancy. Fourteen states require doctors to report if evidence of prenatal substance abuse exists. Guide a class discussion with the following questions:

- How do you think the criminal justice system should deal with mothers who abuse drugs during pregnancy?
- If states pursue offenders of this crime, how do you think society, in general, would be affected?

State policies in brief. (2013, September). New York: The Alan Guttmacher Institute. Retrieved from www.guttmacher.org/statecenter/spibs/spib_SADP.pdf.

TEACH

Diversity Connections

Children with birth defects are treated differently depending on what culture they are born into. Have students identify a culture they are interested in and explore the following questions:

- Do superstitions exist in the culture regarding how birth defects are explained? Describe them.
- What types of support services are available for children with birth defects and their families?
- How much prenatal education is available to expectant mothers regarding teratogens and nutrition?

TEACH

Flip It

Students can get additional help understanding teratogens by watching the Flip It Video: Teratogens.

ENGAGE

Enrichment

The presence of certain reflexes at birth signal normal neurological development. Other reflexes infants possess at birth include the following:

- **Babinski reflex**—the toes flare out and then curl back in when the bottom of the foot is stroked.
- **Moro reflex**—arms are thrust out and the back is arched in response to surprise or a sudden noise or movement.

- **Plantar reflex**—the toes will curl in when the ball of the foot is pressed.
- **Swimming reflex**—if submerged in water for a short period of time, infants hold their breath and pump their arms and legs.
- **Stepping reflex**—infants move feet up and down as if they are walking when held up over a flat surface.

ENGAGE**Enrichment**

The Apgar test is a quick physical test given to every newborn at birth. Scores are given at 1 and 5 minutes after birth. If problems exist, then another test is given at 10 minutes after birth. A score of 7–10 is considered normal. Infants scoring 4–6 might need resuscitation, whereas scores of 3 or lower require immediate resuscitation. Apgar is an acronym for the following tests:

A = Activity or muscle tone. Muscle movements are measured.

P = Pulse. Ideally, newborns have a heart rate of over 100 beats per minute.

G = Grimace or reflex irritability. Active newborns sneeze and cough during suctioning of the mucus in their noses and mouths.

A = Appearance. Doctors look for normal skin color. Blue-gray or pale skin color is not a good sign.

R = Respiration. Newborns should be crying and breathing regularly.

TEACH**Common Pitfalls**

Habituation is an often-confused concept. Help students understand how habituation works. Once the stimulus becomes familiar and expected, sensitivity to it decreases. We do not respond as strongly to it as we did in the beginning. An example of this is when people watch scary movies. At first, they react very strongly to the frightening scenes. However, the more they watch scary movies, the less they may respond to startling or gory scenes; they become habituated. Students may want to offer examples of habituation in their own lives.

habituation decreasing responsiveness with repeated stimulation. As infants gain familiarity with repeated exposure to a visual stimulus, their interest wanes and they look away sooner.

The pioneering American psychologist William James presumed that the newborn experiences a “blooming, buzzing confusion,” an assumption few people challenged until the 1960s. But then scientists discovered that babies can tell you a lot—if you know how to ask. To ask, you must capitalize on what babies can do—gaze, suck, turn their heads. So, equipped with eye-tracking machines and pacifiers wired to electronic gear, researchers set out to answer parents’ age-old questions: What can my baby see, hear, smell, and think?

Consider how researchers exploit **habituation**—a decrease in responding with repeated stimulation. We saw this earlier when fetuses adapted to a vibrating, honking device placed on their mother’s abdomen. The novel stimulus gets attention when first presented. With repetition, the response weakens. This seeming boredom with familiar stimuli gives us a way to ask infants what they see and remember.

An example: Researchers have used *visual preference* to “ask” 4-month-olds how they recognize cats and dogs (Quinn, 2002; Spencer et al., 1997). First, they showed the infants a series of images of either cats or dogs. Then they showed them hybrid cat-dog images (**FIGURE 45.4**). Which of those two animals do you think the infants would find more novel (measured in looking time) after seeing a series of cats? It was the hybrid animal with the dog’s head (and vice versa if they previously viewed dogs). This suggests that infants, like adults, focus first on the face, not the body.

Figure 45.4
Quick—which is the cat? Researchers used cat-dog hybrid images such as these to test how infants categorize animals.



Indeed, even as newborns, we prefer sights and sounds that facilitate social responsiveness. We turn our heads in the direction of human voices. We gaze longer at a drawing of a face-like image (**FIGURE 45.5**). We prefer to look at objects 8 to 12 inches away. Wonder of wonders, that just happens to be the approximate distance between a nursing infant’s eyes and its mother’s (Maurer & Maurer, 1988).

Figure 45.5
Newborns’ preference for faces When shown these two stimuli with the same elements, Italian newborns spent nearly twice as many seconds looking at the face-like image (Johnson & Morton, 1991). Canadian newborns display the same apparently inborn preference to look toward faces (Mondloch et al., 1999).



Within days after birth, our brain’s neural networks were stamped with the smell of our mother’s body. Week-old nursing babies, placed between a gauze pad from their mother’s bra and one from another nursing mother, have usually turned toward the smell of their own mother’s pad (MacFarlane, 1978). What’s more, that smell preference lasts. One experiment capitalized on the fact that some nursing mothers in a French maternity ward applied a

ENGAGE**Enrichment**

The research techniques Myers describes in this section have revolutionized the study of psychology. Now that scientists can interpret infant behaviors, we can know more about how infants think and come close to answering questions about when different psychological phenomena begin to emerge.

balm with a chamomile scent to prevent nipple soreness (Delaunay-El Allam, et al., 2010). Twenty-one months later, their toddlers preferred playing with chamomile-scented toys! Their peers who had not sniffed the scent while breast feeding showed no such preference. (This makes one wonder: Will adults who as babies associated chamomile scent with their mother's breast become devoted chamomile tea drinkers?)

Before You Move On

▶ ASK YOURSELF

Are you surprised by the news of infants' competencies? Remember hindsight bias from Module 4? Is this one of those cases where it feels like you "knew it all along"?

▶ TEST YOURSELF

Your friend's older sister—a regular drinker—hopes to become pregnant soon and has stopped drinking. Why is this a good idea? What negative effects might alcohol consumed during pregnancy have on a developing fetus?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 45 Review

45-1 What three issues have engaged developmental psychologists?

- *Developmental psychologists* study physical, mental, and social changes throughout the life span.
- They focus on three issues: nature and nurture (the interaction between our genetic inheritance and our experiences); continuity and stages (whether development is gradual and continuous or a series of relatively abrupt changes); and stability and change (whether our traits endure or change as we age).

45-2 What is the course of prenatal development, and how do teratogens affect that development?

- The life cycle begins at conception, when one sperm cell unites with an egg to form a *zygote*.
- The zygote's inner cells become the *embryo*, and in the next 6 weeks, body organs begin to form and function.
- By 9 weeks, the *fetus* is recognizably human.
- *Teratogens* are potentially harmful agents that can pass through the placental screen and harm the developing embryo or fetus, as happens with *fetal alcohol syndrome*.

45-3 What are some newborn abilities, and how do researchers explore infants' mental abilities?

- Babies are born with sensory equipment and reflexes that facilitate their survival and their social interactions with adults. For example, they quickly learn to discriminate their mother's smell and sound.
- Researchers use techniques that test *habituation*, such as the visual-preference procedure, to explore infants' abilities.

CLOSE & ASSESS

Exit Assessment

Have students take one side of each major developmental issue (nature or nurture, stability or change, stages or continuity) and have them describe prenatal and infant development from that side of the issue.

Answers to Multiple-Choice Questions

1. a 4. d 7. e
 2. b 5. a
 3. c 6. e

Answer to Practice FRQ 2

1 point: **Nature/Nurture:** Traits and abilities are influenced by both nature (genetics) and nurture (environment).

1 point: **Continuity/Stages:** Traits and abilities may develop gradually throughout the life span, or through distinct stages.

1 point: **Stability/Change:** Traits and abilities may be steady over time, but maturation or events may also produce change.

Multiple-Choice Questions

- Alcohol is a teratogen that can slip through the _____ and damage the fetus or embryo.
 - placenta
 - nervous system
 - womb
 - brainstem
 - zygote
- Even as newborns, we prefer sights and sounds that facilitate social responsiveness. This can be seen by a newborn's preference for
 - soft music.
 - face-like images.
 - low pitched sounds.
 - soft colors.
 - loud music.
- As infants gain familiarity with repeated exposure to a visual stimulus, their interest wanes and they look away sooner. The decrease in an infant's responsiveness is called
 - concentration.
 - teratogens.
 - habituation.
 - stability.
 - transference.
- Which question expresses the developmental issue of stability and change?
 - Are individuals more similar or different from each other?
 - How much of development occurs in distinct stages?
 - How much of development is determined by genetics?
 - To what extent do certain traits persist through the life span?
 - Which traits are most affected by life changes and experience?
- What is the prenatal development sequence?
 - Zygote, embryo, fetus
 - Fetus, zygote, embryo
 - Embryo, zygote, fetus
 - Zygote, fetus, embryo
 - Fetus, embryo, zygote
- Some people think development occurs much in the way a tree grows, slowly and steadily adding one ring each year. Others think that there are rather abrupt developmental jumps, like the transformation of a tadpole into a frog. Which of the following issues would this difference of opinion relate to?
 - Nature and nurture
 - Maturation and learning
 - Prenatal and neonatal
 - Stability and change
 - Continuity and stages
- Which of the following is the longest prenatal stage?
 - Teratogen
 - Conception
 - Zygote
 - Embryo
 - Fetus

Practice FRQs

- What is habituation? How is this phenomenon used by researchers in examining newborns' abilities?

Answer

1 point: Habituation is the decrease in responding with repeated stimulation.

1 point: Researchers use habituation to see what infants recognize and remember.

- Three major issues are addressed by psychologists in the study of human development. Identify and state how all three might be considered to explain how children's traits and abilities develop.

(3 points)

Module 46

Infancy and Childhood: Physical Development

Module Learning Objectives

46-1 Describe some developmental changes in brain and motor abilities during infancy and childhood.

46-2 Describe how an infant's developing brain begins processing memories.

46-1 During infancy and childhood, how do the brain and motor skills develop?

During infancy, a baby grows from newborn to toddler, and during childhood from toddler to teenager. We all traveled this path, with its physical, cognitive, and social milestones.

As a flower unfolds in accord with its genetic instructions, so do we. **Maturation**—the orderly sequence of biological growth—decreases many of our commonalities. We stand before walking. We use nouns before adjectives. Severe deprivation or abuse can retard development. Yet the genetic growth tendencies are inborn. Maturation (nature) sets the basic course of development; experience (nurture) adjusts it. Once again, we see genes and scenes interacting.

Brain Development

In your mother's womb, your developing brain formed nerve cells at the explosive rate of nearly one-quarter million per minute. The developing brain cortex actually overproduces neurons, with the number peaking at 28 weeks and then subsiding to a stable 23 billion or so at birth (Rabinowicz et al., 1996, 1999; de Courten-Myers, 2002).

From infancy on, brain and mind—neural hardware and cognitive software—develop together. On the day you were born, you had most of the brain cells you would ever have. However, your nervous system was immature: After birth, the branching neural networks that eventually enabled you to walk, talk, and remember had a wild growth spurt (**FIGURE 46.1** on the next page). From ages 3 to 6, the most rapid growth was in your frontal lobes, which enable rational planning. This explains why preschoolers display a rapidly developing ability to control their attention and behavior (Garon et al., 2008).

The association areas—those linked with thinking, memory, and language—are the last cortical areas to develop. As they do, mental abilities surge (Chugani & Phelps, 1986; Thatcher et al., 1987). Fiber pathways supporting language and agility proliferate into puberty. A use-it-or-lose-it *pruning process* shuts down unused links and strengthens others (Paus et al., 1999; Thompson et al., 2000).



"It is a rare privilege to watch the birth, growth, and first feeble struggles of a living human mind."
-ANNIE SULLIVAN, IN HELEN KELLER'S *THE STORY OF MY LIFE*, 1903

maturation biological growth processes that enable orderly changes in behavior, relatively uninfluenced by experience.

AP® Exam Tip

Note that maturation, to developmental psychologists, is a biological sequence. This is much more precise than the general notion that maturation means to become more adult-like.

TEACH

TRM Discussion Starter

Use the Module 46 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH

Concept Connections

Link this discussion of brain development to evolutionary psychology. The parts of the brain responsible for more basic functions develop and mature first, followed by areas responsible for higher-order thinking.

TEACH

Concept Connections

The "use-it-or-lose-it" *pruning process* helps explain the process of long-term potentiation, discussed in Unit VII. Long-term potentiation occurs when a neural pathway is used over and over again. When this happens, the pathway is strengthened. This is the biological component of learning. Help students see that, biologically speaking, practice does matter.

TEACH**Diversity Connections**

Due to environmental circumstances, development can occur on a different time schedule. If environmental conditions are somewhat harsh and lead to a low life expectancy, development can occur on a faster timetable than for people living in cultures where the life span is longer. Yet, even if development is quicker, the milestones happen in the same order regardless. Certain cultural groups in Africa have shown that maturational milestones can occur in the same order but on different schedules. Have students explore the developmental timelines for a variety of groups in African countries to determine whether maturational milestones occur at different times. Students will likely note that although the timing of events may differ from culture to culture, the order of development does not differ.

TEACH**TRM Teaching Tip**

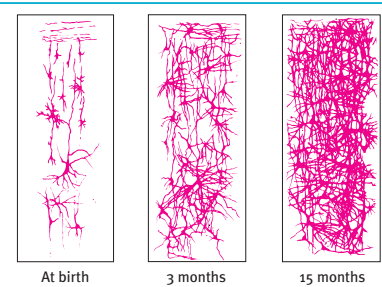
Students may not have experience being around infants or toddlers. Have students who have younger siblings or who babysit discuss their experiences with their peers who may not have opportunities to observe development firsthand. Use Student Activity: Identifying Developmental Landmarks from the TRM for students to discuss infancy and childhood milestones.

FYI

In the eight years following the 1994 launch of a U.S. Back to Sleep educational campaign, the number of infants sleeping on their stomach dropped from 70 to 11 percent—and SIDS (Sudden Infant Death Syndrome) deaths fell by half (Braiker, 2005).

Figure 46.1

Drawings of human cerebral cortex sections In humans, the brain is immature at birth. As the child matures, the neural networks grow increasingly more complex.

**Motor Development**

The developing brain enables physical coordination. As an infant's muscles and nervous system mature, skills emerge. With occasional exceptions, the motor development sequence is universal. Babies roll over before they sit unsupported, and they usually crawl on all fours before they walk (**FIGURE 46.2**). These behaviors reflect not imitation but a maturing nervous system; blind children, too, crawl before they walk.

There are, however, individual differences in timing. In the United States, for example, 25 percent of all babies walk by age 11 months, 50 percent within a week after their first birthday, and 90 percent by age 15 months (Frankenburg et al., 1992). The recommended infant *back-to-sleep position* (putting babies to sleep on their backs to reduce the risk of a smothering crib death) has been associated with somewhat later crawling but not with later walking (Davis et al., 1998; Lipsitt, 2003).

**Figure 46.2**

Triumphant toddlers Sit, crawl, walk, run—the sequence of these motor development milestones is the same the world around, though babies reach them at varying ages.

Genes guide motor development. Identical twins typically begin walking on nearly the same day (Wilson, 1979). Maturation—including the rapid development of the cerebellum at the back of the brain—creates our readiness to learn walking at about age 1. Experience before that time has a limited effect. The same is true for other physical skills, including bowel and bladder control. Before necessary muscular and neural maturation, don't expect pleading or punishment to produce successful toilet training.

TEACH**Flip It**

Students can get additional help understanding how development is ordered and structured by watching the Flip It Video: Major Developmental Milestones.

Brain Maturation and Infant Memory

46-2 How does an infant's developing brain begin processing memories?

Can you recall your first day of preschool or your third birthday party? Our earliest memories seldom predate our third birthday. We see this *infantile amnesia* in the memories of some preschoolers who experienced an emergency fire evacuation caused by a burning popcorn maker. Seven years later, they were able to recall the alarm and what caused it—if they were 4 to 5 years old at the time. Those experiencing the event as 3-year-olds could not remember the cause and usually misrecalled being already outside when the alarm sounded (Pillemer, 1995). Other studies confirm that the average age of earliest conscious memory is 3½ years (Bauer, 2002, 2007). As children mature, from 4 to 6 to 8 years, childhood amnesia is giving way, and they become increasingly capable of remembering experiences, even for a year or more (Bruce et al., 2000; Morris et al., 2010). The brain areas underlying memory, such as the hippocampus and frontal lobes, continue to mature into adolescence (Bauer, 2007).

Apart from constructed memories based on photos and family stories, we *consciously* recall little from before age 4. Yet our brain was processing and storing information during those early years. In 1965, while finishing her doctoral work in psychology, Carolyn Rovee-Collier observed a nonverbal infant memory. She was also a new mom, whose colicky 2-month-old, Benjamin, could be calmed by moving a crib mobile. Weary of hitting the mobile, she strung a cloth ribbon connecting the mobile to Benjamin's foot. Soon, he was kicking his foot to move the mobile. Thinking about her unintended home experiment, Rovee-Collier realized that, contrary to popular opinion in the 1960s, babies are capable of learning. To know for sure that her son wasn't just a whiz kid, she repeated the experiment with other infants (Rovee-Collier, 1989, 1999). Sure enough, they, too, soon kicked more when hitched to a mobile, both on the day of the experiment and the day after. They had learned the link between moving legs and moving mobiles. If, however, she hitched them to a different mobile the next day, the infants showed no learning, indicating that they remembered the original mobile and recognized the difference. Moreover, when tethered to the familiar mobile a month later, they remembered the association and again began kicking (**FIGURE 46.3**).

Traces of forgotten childhood languages may also persist. One study tested English-speaking British adults who had no conscious memory of the Hindi or Zulu they had spoken as children. Yet, up to age 40, they could relearn subtle sound contrasts in these languages that other people could *not* learn (Bowers et al., 2009). What the conscious mind does not know and cannot express in words, the nervous system somehow remembers.



"This is the path to adulthood. You're here."

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Evansbeck/SuperStock

Figure 46.3
Infant at work Babies only 3 months old can learn that kicking moves a mobile, and they can retain that learning for a month. (From Rovee-Collier, 1989, 1997.)

Before You Move On

▶ ASK YOURSELF

What do you tend to regard as your earliest memory? Now that you know about infantile amnesia, has your opinion changed about the accuracy of that memory?

▶ TEST YOURSELF

What is the biological growth process that explains why most children begin walking by about 12 to 15 months?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

TEACH

Teaching Tip

Have students try to recall their earliest memories. Have them ask their parents or older siblings to corroborate their memories, working with them to estimate the approximate age the memory took place. Have students report back with the estimates of their ages for these early memories.

TEACH

Concept Connections

Link this discussion of infantile amnesia with Elizabeth Loftus' research into constructed memories (more on Elizabeth Loftus' research can be found in Unit VII). Loftus and her colleagues have demonstrated the ease with which memories from childhood can be manipulated. In one variation of her typical experiments, she was able to get her participants to remember an impossible memory: meeting Bugs Bunny at Disneyland. Because Bugs Bunny is a Warner Bros. character and not a Disney character, this memory could not possibly have happened. But Loftus was able to generate such a memory in her participants.

CLOSE & ASSESS

Exit Assessment

Have students outline the major milestones of infant and toddler development. Have them explain how timing and order of milestones matter to development.

Module 46 Review

46-1 During infancy and childhood, how do the brain and motor skills develop?

- The brain's nerve cells are sculpted by heredity and experience. Their interconnections multiply rapidly after birth, a process that continues until puberty, when a pruning process begins shutting down unused connections.
- Complex motor skills—sitting, standing, walking—develop in a predictable sequence, though the timing of that sequence is a function of individual *maturation* and culture.

46-2 How does an infant's developing brain begin processing memories?

- We have no conscious memories of events occurring before about age 3½, in part because major brain areas have not yet matured.

Answers to Multiple-Choice Questions

1. b 3. e
2. e 4. a

Multiple-Choice Questions

1. As the infant's brain develops, some neural pathways will decay if not used. This use-it-or-lose-it process is known as
 - a. motor development.
 - b. pruning.
 - c. spacing.
 - d. accommodation.
 - e. maturation.
2. Which of the following depends least on the maturation process?
 - a. Riding a bike
 - b. Writing
 - c. Talking
 - d. Bladder control
 - e. Telling time
3. Which of the following is true of the early formation of brain cells?
 - a. They form at a constant rate throughout the prenatal period.
 - b. They begin forming slowly, and then the rate increases throughout prenatal development.
 - c. They form slowly during the prenatal period, and then the rate increases after birth.
 - d. They form at a constantly increasing rate prenatally and in early childhood.
 - e. They are overproduced early in the prenatal period, and then the rate decreases and stabilizes.
4. Neural networks grow more complex by
 - a. branching outward to form multiple connections.
 - b. keeping the nervous system immature.
 - c. controlling one another with a restricted response system.
 - d. limiting connections.
 - e. associating behaviors that would not normally be associated together.

Practice FRQs

1. Define and give an example of maturation. Define infantile amnesia and explain how maturation contributes to this phenomenon.

Answer

1 point: Maturation is the orderly changes in behavior that result from biological processes that are relatively unaffected by experience.

1 point: Various examples will serve here, such as the normal development of motor skills (e.g., rolling over, crawling) or bladder and bowel control.

1 point: Infantile amnesia is our inability to remember events that occurred before we are about 3½ years old.

1 point: The brain areas underlying memory need to mature before we can remember accurately. This maturation doesn't happen until after the age of 3.

2. Three types of development are listed below. Give a specific example of each.

- Brain development
- Motor development
- Infant memory

(3 points)

Answer to Practice FRQ 2

1 point: Brain development involves increasingly complex neural networking.

1 point: Motor development includes sitting, crawling, walking, and running as well as bowel and bladder control.

1 point: Infant memory encompasses (1) memory of events (episodic memory) and (2) memory of association and learning (procedural memory).



TEACH**TRM Discussion Starter**

Use the Module 47 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

ENGAGE**Enrichment**

Jean Piaget was a child prodigy who excelled in many areas of science including zoology (in which he obtained his Ph.D.), cognitive psychology, and education. His impact on education and psychology was so influential that he was named one of *Time* magazine's 100 Most Important People of the 20th Century.

TEACH**Teaching Tip**

The last sentence of the page on Piaget's core idea points to the constant struggle to make sense of our experiences. Have students discuss times each day in which they try to make sense of their own experiences. What are their typical procedures for sense making? Do they rely on friends or parents/siblings to help them understand things that happen to them? This discussion can help students see how often they engage in these developmental processes.

Module 47

Infancy and Childhood: Cognitive Development

Module Learning Objectives

- 47-1** Describe how a child's mind develops from the perspectives of Piaget, Vygotsky, and today's researchers.
- 47-2** Explain how autism spectrum disorder affects development.



- 47-1** From the perspectives of Piaget, Vygotsky, and today's researchers, how does a child's mind develop?

Somewhere on your precarious journey “from egghood to personhood” (Broks, 2007), you became conscious. When was that, and how did your mind unfold from there? Developmental psychologist Jean Piaget [pee-ah-ZHAY] spent his life searching for the answers to such questions. He studied children's **cognitive** development—all the mental activities associated with thinking, knowing, remembering, and communicating. His interest began in 1920, when he was in Paris developing questions for children's intelligence tests. While administering the tests, Piaget became intrigued by children's wrong answers, which were often strikingly similar among same-age children. Where others saw childish mistakes, Piaget saw intelligence at work.

A half-century spent with children convinced Piaget that a child's mind is not a miniature model of an adult's. Thanks partly to his work, we now understand that children reason differently than adults, in “wildly illogical ways about problems whose solutions are self-evident to adults” (Brainerd, 1996).

Piaget's studies led him to believe that a child's mind develops through a series of stages, in an upward march from the newborn's simple reflexes to the adult's abstract reasoning power. Thus, an 8-year-old can comprehend things a toddler cannot, such as the analogy that “getting an idea is like having a light turn on in your head,” or that a miniature slide is too small for sliding, and a miniature car is much too small to get into (**FIGURE 47.1**).

Piaget's core idea is that the driving force behind our intellectual progression is an unceasing struggle to make sense of our experiences. To this end, the maturing brain

Jean Piaget (1896–1980) “If we examine the intellectual development of the individual or of the whole of humanity, we shall find that the human spirit goes through a certain number of stages, each different from the other” (1930).

AP® Exam Tip

Jean Piaget is such an important person in the history of psychology that it's likely there will be at least one question about him on the AP® exam.

cognition all the mental activities associated with thinking, knowing, remembering, and communicating.





Figure 47.1
Scale errors Psychologists report that 18- to 30-month-old children may fail to take the size of an object into account when trying to perform impossible actions with it (DeLoache, Uttal, & Rosengren, 2004). At left, a 21-month-old attempts to slide down a miniature slide. At right, a 24-month-old opens the door to a miniature car and tries to step inside.

builds **schemas**, concepts or mental molds into which we pour our experiences (**FIGURE 47.2**). By adulthood we have built countless schemas, ranging from *cats* and *dogs* to our concept of *love*.

To explain how we use and adjust our schemas, Piaget proposed two more concepts. First, we **assimilate** new experiences—we interpret them in terms of our current understandings (schemas). Having a simple schema for *dog*, for example, a toddler may call all four-legged animals *dogs*. But as we interact with the world, we also adjust, or **accommodate**, our schemas to incorporate information provided by new experiences. Thus, the child soon learns that the original *dog* schema is too broad and accommodates by refining the category (**FIGURE 47.3**).



Figure 47.2
An impossible object Look carefully at the “devil’s tuning fork.” Now look away—no, better first study it some more—and then look away and draw it. . . . Not so easy, is it? Because this tuning fork is an impossible object, you have no schema for such an image.

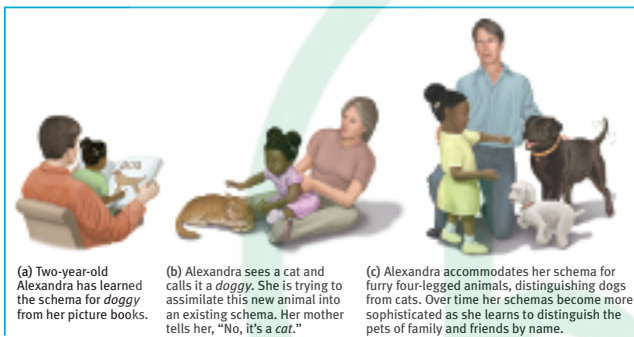


Figure 47.3
Pouring experience into mental molds We use our existing schemas to *assimilate* new experiences. But sometimes we need to *accommodate* (adjust) our schemas to include new experiences.

(a) Two-year-old Alexandra has learned the schema for *doggy* from her picture books.

(b) Alexandra sees a cat and calls it a *doggy*. She is trying to assimilate this new animal into an existing schema. Her mother tells her, “No, it’s a *cat*.”

(c) Alexandra accommodates her schema for furry four-legged animals, distinguishing dogs from cats. Over time her schemas become more sophisticated as she learns to distinguish the pets of family and friends by name.

Piaget’s Theory and Current Thinking

Piaget believed that children construct their understanding of the world while interacting with it. Their minds experience spurts of change, followed by greater stability as they move from one cognitive plateau to the next, each with distinctive characteristics that permit specific kinds of thinking. In Piaget’s view, cognitive development consisted of four major stages—*sensorimotor*, *preoperational*, *concrete operational*, and *formal operational*.

schema a concept or framework that organizes and interprets information.

assimilation interpreting our new experiences in terms of our existing schemas.

accommodation adapting our current understandings (schemas) to incorporate new information.

TEACH

Concept Connections

The word *accommodation* is used in other contexts in psychology. In Unit IV, accommodation occurs when the muscles of the eye change the shape of the lens to focus the image onto the retina.

ENGAGE

TRM Active Learning

A great way to discuss schemas is to use Student Activity: Musk Lifesavers from the TRM. This activity shows how schemas are so often well-learned that we hardly notice them until we encounter something that doesn’t fit. This activity can also be connected to cultural differences in development (Module 46), as it demonstrates that different taste preferences can depend on your cultural context.

TEACH

TRM Teaching Tip

Another example of simple schemas comes from the Disney movie *Bambi*. When the young Bambi is sniffing the flowers with his rabbit friend Thumper, a little skunk pokes his head up through the flowers to say hello. Bambi, having just learned the word “flower,” immediately calls the skunk “Flower,” mistaking him for what he was smelling. Bambi didn’t accommodate his schema for flowers after meeting the skunk. Use Teacher Demonstration: Lollipops and Gloquex from the TRM to further demonstrate Piagetian concepts.

TEACH

Flip It

Students can get additional help understanding schemas, assimilation, and accommodation by watching the Flip It Video: Schemas, Assimilation, and Accommodation.

TEACH**Common Pitfalls**

Help students remember the sensorimotor stage by breaking down the word *sensorimotor* into *sensory* and *motor*. Remind students that infants are sensory beings because they look intently on stimuli that interest them and listen to soothing sounds. Infants are also constantly moving. They move their bodies, often by accident, to discover what they are capable of and what objects within their reach can do.

ENGAGE**Enrichment**

After infants have mastered object permanence, they engage in something called *directed groping*. Infants will move in different ways to achieve a goal; they may use sticks or other objects to help them get other objects.

ENGAGE**Enrichment**

The sensorimotor stage can be broken down into 3 different substages:

- *Primary circular reactions* involve infants experimenting with their own bodies. They enjoy moving their arms and legs and making noises with their mouths.
- *Secondary circular reactions* occur when infants respond to other people or objects. They will repeat actions over and over to get the desired response (such as a smile from Mommy).
- *Tertiary circular reactions* take infants even further as they explore the outside world. Usually, they will accidentally cause an event to occur, for example, by kicking a ball. Then, they will devise new activities with that object to make it do other things, like bouncing the ball or putting it in a box and taking it out over and over again.

Sensorimotor Stage

In the **sensorimotor stage**, from birth to nearly age 2, babies take in the world through their senses and actions—through looking, hearing, touching, mouthing, and grasping. As their hands and limbs begin to move, they learn to make things happen.

Very young babies seem to live in the present: Out of sight is out of mind. In one test, Piaget showed an infant an appealing toy and then flopped his beret over it. Before the age of 6 months, the infant acted as if it ceased to exist. Young infants lack **object permanence**—the awareness that objects continue to exist when not perceived. By 8 months, infants begin exhibiting memory for things no longer seen. If you hide a toy, the infant will momentarily look for it (**FIGURE 47.4**). Within another month or two, the infant will look for it even after being restrained for several seconds.



Figure 47.4
Object permanence Infants younger than 6 months seldom understand that things continue to exist when they are out of sight. But for this older infant, out of sight is definitely not out of mind.

So does object permanence in fact blossom at 8 months, much as tulips blossom in spring? Today's researchers think not. They believe object permanence unfolds gradually, and they see development as more continuous than Piaget did. Even young infants will at least momentarily look for a toy where they saw it hidden a second before (Wang et al., 2004).

Researchers also believe Piaget and his followers underestimated young children's competence. Consider these simple experiments:

- *Baby physics*: Like adults staring in disbelief at a magic trick (the “Whoa!” look), infants look longer at an unexpected and unfamiliar scene of a car seeming to pass through a solid object, a ball stopping in midair, or an object violating object permanence by magically disappearing (Baillargeon, 1995, 2008; Wellman & Gelman, 1992).
- *Baby math*: Karen Wynn (1992, 2000) showed 5-month-olds one or two objects (**FIGURE 47.5a**). Then she hid the objects behind a screen, and visibly removed or added one (Figure 47.5d). When she lifted the screen, the infants sometimes did a double take, staring longer when shown a wrong number of objects (Figure 47.5f). But were they just responding to a greater or smaller *mass* of objects, rather than a change in *number* (Feigenson et al., 2002)? Later experiments showed that babies' number sense extends to larger numbers, to ratios, and to such things as drumbeats and motions (Libertus & Brannon, 2009; McCrink & Wynn, 2004; Spelke & Kinzler, 2007). If accustomed to a Daffy Duck puppet jumping three times on stage, they showed surprise if it jumped only twice.

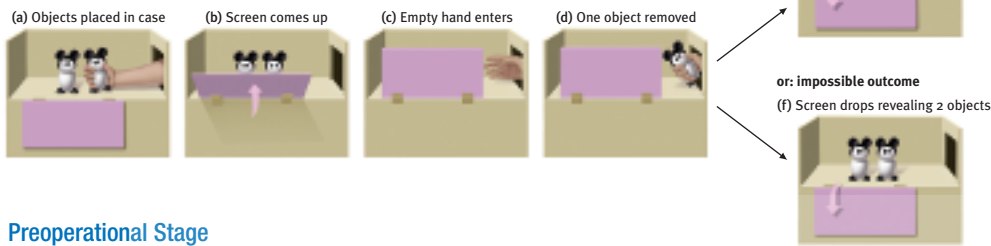
Clearly, infants are smarter than Piaget appreciated. Even as babies, we had a lot on our minds.

sensorimotor stage in Piaget's theory, the stage (from birth to about 2 years of age) during which infants know the world mostly in terms of their sensory impressions and motor activities.

object permanence the awareness that things continue to exist even when not perceived.

Figure 47.5

Baby math Shown a numerically impossible outcome, 5-month-old infants stare longer. (From Wynn, 1992.)



Preoperational Stage

Piaget believed that until about age 6 or 7, children are in a **preoperational stage**—too young to perform *mental operations* (such as imagining an action and mentally reversing it). For a 5-year-old, the milk that seems “too much” in a tall, narrow glass may become an acceptable amount if poured into a short, wide glass. Focusing only on the height dimension, this child cannot perform the operation of mentally pouring the milk back. Before about age 6, said Piaget, children lack the concept of **conservation**—the principle that quantity remains the same despite changes in shape (**FIGURE 47.6**).

Piaget did not view the stage transitions as abrupt. Even so, *symbolic thinking* (representing things with words and images) appears at an earlier age than he supposed. Judy DeLoache (1987) discovered this when she showed children a model of a room and hid a model toy in it (a miniature stuffed dog behind a miniature couch). The 2½-year-olds easily remembered where to find the miniature toy, but they could not use the model to locate an actual stuffed dog behind a couch in a real room. Three-year-olds—only 6 months older—usually went right to the actual stuffed animal in the real room, showing they *could* think of the model as a symbol for the room. Piaget probably would have been surprised.

EGOCENTRISM

Piaget contended that preschool children are **egocentric**: They have difficulty perceiving things from another’s point of view. Asked to “show Mommy your picture,” 2-year-old Gabriella holds the picture up facing her own eyes. Three-year-old Gray makes himself “invisible” by putting his hands over his eyes, assuming that if he can’t see his grandparents,

preoperational stage

in Piaget’s theory, the stage (from about 2 to about 6 or 7 years of age) during which a child learns to use language but does not yet comprehend the mental operations of concrete logic.

conservation the principle (which Piaget believed to be a part of concrete operational reasoning) that properties such as mass, volume, and number remain the same despite changes in the forms of objects.

egocentrism in Piaget’s theory, the preoperational child’s difficulty taking another’s point of view.

AP® Exam Tip

Careful! *Egocentric* is not the same as *egotistical*. *Egocentric* means you can’t take someone else’s point of view. *Egotistical* means you’re pretty full of yourself.



Figure 47.6

Piaget’s test of conservation

This preoperational child does not yet understand the principle of conservation of substance. When the milk is poured into a tall, narrow glass, it suddenly seems like “more” than when it was in the shorter, wider glass. In another year or so, she will understand that the quantity stays the same.

TEACH

Concept Connections

Children move through 2 stages of language development (discussed in Unit VII) in the preoperational stage:

- **Holographic speech** appears around one year of age and involves using single words to stand for a whole sentence of meaning. For example, the word “ball” could mean “I want the ball,” or “Where is the ball?” depending on the inflection.

- **Telegraphic speech** appears around 2 years of age and involves 2-word phrases that communicate more meaning. For example, a child differentiates desires by saying “want ball” and “where ball?”

TEACH

TRM Teaching Tip

An understanding of conservation depends on an understanding of reversibility. If children were able to think about situations both forward and backward, they would not have trouble with conservation. Use Teacher Demonstration: Demonstrating Preoperational Thought from the TRM to demonstrate a task in conservation that often challenges both high school and college students.

ENGAGE

TRM Applying Science

Set up a lab practicum in which students must identify different preoperational Piagetian tasks and what concept each task measures. Use Student Activity: Intellectual Development from the TRM for instructions for setting up such a practicum.

ENGAGE

TRM Enrichment

Children misunderstand conservation in several ways:

- **Volume:** As described in the text, children believe that different sized containers hold different amounts of liquid.
- **Length:** Children believe that an object’s shape changes its mass. Taking a ball of Play-Doh® and making a snake out of it will lead a child to believe that some of the Play-Doh® is missing.
- **Area:** Children believe that rearranging parts of an object changes it fundamentally.

Use Student Activity: Conservation and Jelly Beans from the TRM to demonstrate how conservation works in young children.

ENGAGE**Enrichment**

Egocentrism manifests in children in several different ways:

- **Collective monologues:** Children will appear to be talking to each other in a dialogue, but they are really talking about 2 completely different subjects.
- **Animism:** Children believe that nature is alive and controllable by them or their parents. They often believe natural things, such as trees or the sun, have feelings.
- **Artificialism:** Children believe natural phenomena are created by people. For instance, that mountains were created by someone piling up a bunch of dirt.

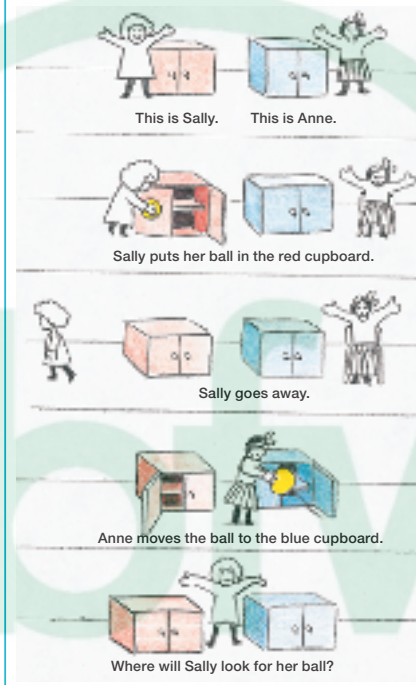
ENGAGE**Active Learning**

Invite a group of preoperational children to class (or visit their school) and conduct Piagetian tasks with them. Warn students that the younger children who are solidly preoperational will be pleased at their great performance on the tasks but older children, who are moving toward concrete operations, may wonder if they are being tricked or if your students are a little dim themselves! Overall, your students should encourage the children regardless of their responses. If they get the “wrong” answers, that does not reflect on their intelligence.

theory of mind people's ideas about their own and others' mental states—about their feelings, perceptions, and thoughts, and the behaviors these might predict.

Figure 47.7

Testing children's theory of mind This simple problem illustrates how researchers explore children's presumptions about others' mental states. (Inspired by Baron-Cohen et al., 1985.)



Roger has not outgrown his early childhood egocentrism.

and adults often overestimate the extent to which others share our opinions and perspectives, a trait known as the *curse of knowledge*. We assume that something will be clear to others if it is clear to us, or that text message recipients will “hear” our “just kidding” intent (Epley et al., 2004; Kruger et al., 2005). Children are even more susceptible to this tendency.

THEORY OF MIND

When Little Red Riding Hood realized her “grandmother” was really a wolf, she swiftly revised her ideas about the creature’s intentions and raced away. Preschoolers, although still egocentric, develop this ability to infer others’ mental states when they begin forming a **theory of mind** (a term first coined by psychologists to describe chimpanzees’ seeming ability to read intentions [Premack & Woodruff, 1978]).

Infants as young as 7 months show some knowledge of others’ beliefs (Kovács et al., 2010). With time, the ability to take another’s perspective develops. They come to understand what made a playmate angry, when a sibling will share, and what might make a parent buy a toy. And they begin to tease, empathize, and persuade. Between about 3½ and 4½, children worldwide come to realize that others may hold false beliefs (Callaghan et al., 2005; Sabbagh et al., 2006). Researchers showed Toronto children a Band-Aids box and asked them what was inside (Jenkins & Astington, 1996). Expecting Band-Aids, the children were surprised to discover that the box actually contained pencils. Asked what a child who had never seen the box would think was inside, 3-year-olds typically answered “pencils.” By age 4 to 5, the children’s theory of mind had leapt forward, and they anticipated their friends’ false belief that the box would hold Band-Aids.

In a follow-up experiment, children viewed a doll named Sally leaving her ball in a red cupboard (**FIGURE 47.7**). Another doll, Anne, then moves the ball to a blue cupboard. Researchers then pose a question: When Sally returns, where will she look for the ball? Children with *autism spectrum disorder* (ASD; see Close-up: Autism Spectrum Disorder and “Mind-Blindness”) have difficulty understanding that Sally’s state of mind differs from their own—that Sally, not knowing the ball has been moved, will return to the red cupboard. They also have difficulty reflecting on their own mental states. They are, for example, less likely to use the personal pronouns *I* and *me*. Deaf children with hearing parents and minimal communication opportunities have had similar difficulty inferring others’ states of mind (Peterson & Siegal, 1999).

they can’t see him. Children’s conversations also reveal their egocentrism, as one young boy demonstrated (Phillips, 1969, p. 61):

“Do you have a brother?”
 “Yes.”
 “What’s his name?”
 “Jim.”
 “Does Jim have a brother?”
 “No.”

Like Gabriella, TV-watching preschoolers who block your view of the TV assume that you see what they see. They simply have not yet developed the ability to take another’s viewpoint. Even teens

ENGAGE**Active Learning**

Develop a partnership with an elementary school or preschool in your area so that your students can interact with young children to further research children’s cognitive development.

- Students may participate in a pen pal or tutoring program with elementary schoolchildren, learning how young children interact socially and intellectually as well as how children process information as they try to solve problems in reading or math.

- Encourage students to write a narrative about their experiences as tutors and/or pen pals.

Close-up

Autism Spectrum Disorder and “Mind-Blindness”

47-2 How does autism spectrum disorder affect development?

Diagnoses of **autism spectrum disorder (ASD)**, a disorder marked by social deficiencies and repetitive behaviors, have been increasing, according to recent estimates. Once believed to affect 1 in 2500 children, ASD now affects 1 in 110 American children and about 1 in 100 in Britain (CDC, 2009; Lillienfeld & Arkowitz, 2007; NAS, 2011). The increase in ASD diagnoses has been offset by a decrease in the number of children considered “cognitively disabled” or “learning disabled,” which suggests a relabeling of children’s disorders (Gernsbacher et al., 2005; Grinker, 2007; Shattuck, 2006). A massive \$6.7 billion National Children’s Study now under way aims to enroll 100,000 pregnant women in 105 countries and to follow their babies until they turn 21—partly in hopes of explaining the rising rates of ASD, as well as premature births, childhood obesity, and asthma (Belluck, 2010; Murphy, 2008).

The underlying source of ASD’s symptoms seems to be poor communication among brain regions that normally work together to let us take another’s viewpoint. This effect appears to result from ASD-related genes interacting with the environment (State & Sestan, 2012). People with ASD are therefore said to have an *impaired theory of mind* (Rajendran & Mitchell, 2007; Senju et al., 2009). They have difficulty inferring others’ thoughts and feelings. They do not appreciate that playmates and parents might view things differently. Mind reading that most of us find intuitive (*Is that face conveying a smirk or a sneer?*) is difficult for those with ASD. Most children learn that another child’s pouting mouth signals sadness, and that twinkling eyes mean happiness or mischief. A child with ASD fails to understand these signals (Frith & Frith, 2001).



Autism spectrum disorder This speech-language pathologist is helping a boy with ASD learn to form sounds and words. ASD is marked by deficient social communication and difficulty grasping others’ states of mind.

autism spectrum disorder (ASD) a disorder that appears in childhood and is marked by significant deficiencies in communication and social interaction, and by rigidly fixated interests and repetitive behaviors.



“Autism” case number 1 In 1943, Donald Gray Triplett, an “odd” child with unusual gifts and social deficits, was the first person to receive the diagnosis of a previously unreported condition, which psychiatrist Leo Kanner termed “autism.” (After a 2013 change in the diagnosis manual, his condition is now called autism spectrum disorder.) In 2010, at age 77, Triplett was still living in his family home and Mississippi town, where he often played golf (Donvan & Zucker, 2010).

In hopes of a cure, desperate parents have sometimes subjected children to dubious therapies (Shute, 2010).

ASD (formerly referred to as “autism”) has differing levels of severity. “High-functioning” individuals generally have normal intelligence, and they often have an exceptional skill or talent in a specific area. But they lack social and communication skills, and they tend to become distracted by minor and unimportant stimuli (Remington et al., 2009). Those at the spectrum’s lower end are unable to use language at all.

ASD afflicts four boys for every girl. Psychologist Simon Baron-Cohen believes this hints at one way to understand this disorder. He has argued that ASD represents an “extreme male brain” (2008, 2009). Although there is some overlap between the sexes, he believes that boys are better “systemizers.” They tend to understand things according to rules or laws, for example, as in mathematical and mechanical systems. Children exposed to high levels of the male sex hormone *testosterone* in the womb may develop more masculine and autistic traits (Auyeung et al., 2009).

In contrast, girls are naturally predisposed to be “empathizers,” Baron-Cohen contends. They are better at reading facial

(Continued on next page)

ENGAGE

Enrichment

The American Psychiatric Association’s new *Diagnostic and Statistical Manual of Mental Disorders* (Vol. 5), published in 2013, changed the criteria for diagnosing autism disorders. Instead of differentiating among many types of autism, the DSM–5 collapsed all autistic disorders into a category called *autism spectrum disorders*. Asperger’s syndrome, a form of high-functioning autism, is no longer included in the new manual as a distinct classification.

ENGAGE**Enrichment**

One of the leading advocates for the autism community is Temple Grandin, a doctor of animal science and professor at Colorado State University. Grandin was diagnosed with autism at the age of 2. After receiving support from her parents and teachers early in life, she eventually earned her doctorate and channeled her concern for animal welfare by designing animal containment pens that featured curves in order to reduce stress among animals. Grandin has been a leading advocate in the care and support of people with autism. She has written several books and was the subject of a movie about her life starring Claire Danes, who won an Emmy for her portrayal of Grandin. Students can learn more about Grandin from her website at <http://templegrandin.com>.

ENGAGE**Active Learning**

Have students conduct research into autism spectrum disorder.

- What are the signs and symptoms of the disorder?
- What are some common theories for the cause of the disorder?
- How has our conception of the disorder changed throughout history?
- What treatments hold promise for people with this disorder?

Close-up (continued)

expressions and gestures, though less so if given testosterone (van Honk et al., 2011).

Biological factors, including genetic influences and abnormal brain development, contribute to ASD (State & Šestan, 2012). Childhood MMR vaccinations do not (Demicheli et al., 2012). Based on a fraudulent 1998 study—"the most damaging medical hoax of the last 100 years" (Flaherty, 2011)—some parents were misled into thinking that the childhood MMR vaccine increased risk of ASD. The unfortunate result was a drop in vaccination rates and an increase in cases of measles and mumps. Some unvaccinated children suffered long-term harm or even death.

Twin and sibling studies provide some evidence for biology's influence. If one identical twin is diagnosed with ASD, the chances are 50 to 70 percent that the co-twin will be as well (Lichtenstein et al., 2010; Sebat et al., 2007). A younger sibling of a child with ASD also is at a heightened risk (Sutcliffe, 2008). Random genetic mutations in sperm-producing cells may also play a role. As men age, these mutations become more frequent, which may help explain why an over-40 man has a much higher risk of fathering a child with ASD than does a man under 30 (Reichenberg et al., 2007). Researchers are now sleuthing ASD's telltale signs in the brain's synaptic and gray matter (Crawley, 2007; Ecker et al., 2010; Garber, 2007).

Biology's role in ASD also appears in brain-function studies. People without ASD often yawn after seeing others yawn. And as they view and imitate another's smiling or frowning, they feel something of what the other is feeling. Not so among those with ASD, who are less imitative and show much less activity in brain areas involved in mirroring others' actions (Dapretto et al., 2006; Perra et al., 2008; Senju et al., 2007). When people with ASD watch another person's hand move-

ments, for example, their brain displays less than normal mirroring activity (Oberman & Ramachandran, 2007; Théoret et al., 2005). Scientists are continuing to explore and vigorously debate the idea that the brains of people with ASD have "broken mirrors" (Gallese et al., 2011).

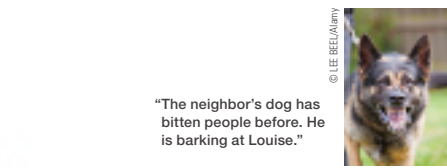
Seeking to "systemize empathy," Baron-Cohen and his Cambridge University colleagues (2007; Golan et al., 2010) collaborated with Britain's National Autistic Society and a film production company. Knowing that television shows with vehicles have been popular among kids with ASD, they created animations that grafted emotion-conveying faces onto toy tram, train, and tractor characters in a pretend boy's bedroom (**FIGURE 47.8**). After the boy leaves for school, the characters come to life and have experiences that lead them to display various emotions (which I predict you would enjoy viewing at www.thetransporters.com). The children were surprisingly able to generalize what they had learned to a new, real context. By the intervention's end, their previously deficient ability to recognize emotions on real faces now equaled that of children without ASD.

Figure 47.8

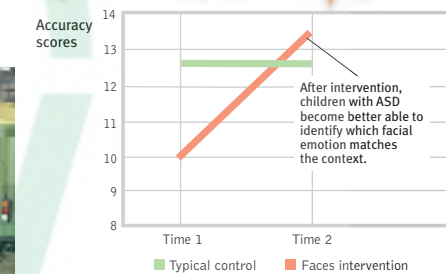
Transported into a world of emotion (a) A research team at Cambridge University's Autism Research Centre introduced children with ASD to emotions experienced and displayed by toy vehicles. (b) After 4 weeks of viewing animations, the children displayed a markedly increased ability to recognize emotions not only in the toy faces but also in humans.



(a) Emotion-conveying faces were grafted onto toy trains.



Point to the face that shows how Louise is feeling.



(b) Children matched the correct face with the story and photo. (The graph above shows data from two trials.)

Concrete Operational Stage

By age 6 or 7, said Piaget, children enter the **concrete operational stage**. Given concrete (physical) materials, they begin to grasp conservation. Understanding that change in form does not mean change in quantity, they can mentally pour milk back and forth between glasses of different shapes. They also enjoy jokes that use this new understanding:

Mr. Jones went into a restaurant and ordered a whole pizza for his dinner. When the waiter asked if he wanted it cut into 6 or 8 pieces, Mr. Jones said, "Oh, you'd better make it 6, I could never eat 8 pieces!" (McGhee, 1976)

Piaget believed that during the concrete operational stage, children become able to comprehend mathematical transformations and conservation. When my daughter, Laura, was 6, I was astonished at her inability to reverse simple arithmetic. Asked, "What is 8 plus 4?" she required 5 seconds to compute "12," and another 5 seconds to then compute 12 minus 4. By age 8, she could answer a reversed question instantly.

Formal Operational Stage

By age 12, our reasoning expands from the purely concrete (involving actual experience) to encompass abstract thinking (involving imagined realities and symbols). As children approach adolescence, said Piaget, many become capable of thinking more like scientists. They can ponder hypothetical propositions and deduce consequences: *If this, then that*. Systematic reasoning, what Piaget called **formal operational** thinking, is now within their grasp.

Although full-blown logic and reasoning await adolescence, the rudiments of formal operational thinking begin earlier than Piaget realized. Consider this simple problem:

If John is in school, then Mary is in school. John is in school. What can you say about Mary?

Formal operational thinkers have no trouble answering correctly. But neither do most 7-year-olds (Suppes, 1982). **TABLE 47.1** summarizes the four stages in Piaget's theory.

Table 47.1 Piaget's Stages of Cognitive Development

Typical Age Range	Description of Stage	Developmental Phenomena
Birth to nearly 2 years	<i>Sensorimotor</i> Experiencing the world through senses and actions (looking, hearing, touching, mouthing, and grasping)	<ul style="list-style-type: none"> Object permanence Stranger anxiety
About 2 to about 6 or 7 years	<i>Preoperational</i> Representing things with words and images (symbolic thinking); using intuitive rather than logical reasoning	<ul style="list-style-type: none"> Pretend play Egocentrism
6 or 7 to 11 years	<i>Concrete operational</i> Thinking logically about concrete events; grasping concrete analogies and performing arithmetical operations	<ul style="list-style-type: none"> Conservation Mathematical transformations
About 12 through adulthood	<i>Formal operational</i> Abstract reasoning	<ul style="list-style-type: none"> Abstract logic Potential for mature moral reasoning

concrete operational stage in Piaget's theory, the stage of cognitive development (from about 6 or 7 to 11 years of age) during which children gain the mental operations that enable them to think logically about concrete events.

formal operational stage in Piaget's theory, the stage of cognitive development (normally beginning about age 12) during which people begin to think logically about abstract concepts.

AP® Exam Tip

One good way to master the developmental milestones in Piaget's theory is to see them in action. If you know children of various ages, you can test them using some of the ideas presented in this section. Hide a toy from an infant to see object permanence in action. Pour water between two differently shaped glasses to see if a preschooler understands conservation.



Pretend play

TEACH

Teaching Tip

Concrete operational thinking differs from preoperational thinking only in that concrete operational thinkers can understand the concepts preoperational children cannot. Conservation makes sense to concrete operational children, and they become less egocentric.

TEACH

TRM Common Pitfalls

Remind students that formal operational thought is not necessarily the ultimate end stage of cognitive thinking. Some studies have shown that even college students have trouble with some of Piaget's formal operational problems, whereas some young children have solved them. Piaget himself admitted that some people may not reach this stage. Others have suggested that even more stages exist beyond formal operations. Use Student Activity: Formal Operational Thought from the TRM to demonstrate this type of thinking for students.

ENGAGE**Enrichment**

Lev Vygotsky was a pioneer of developmental psychology, but he has been less known in the West than Piaget. Vygotsky believed that children learn best by interacting with others. In fact, children will not likely move to the next level of understanding without help from peers or role models. The peer/role model influence helps the child move through the development zone to the next level of understanding. Have students reflect on significant role models or peers who have helped them learn.

ENGAGE**Critical Questions**

Parents who are eager to expose their children to many learning opportunities start their children in various lessons (swimming, instruments, dance, reading, etc.) as early as the first year of life.

- What are some pros and cons of placing very young children in educational opportunities?
- How can parents use knowledge about the cognitive development of children to help their children succeed and avoid anxiety when attempting new skills?



Lev Vygotsky (1896–1934)

Vygotsky, a Russian developmental psychologist pictured here with his daughter, studied how a child's mind feeds on the language of social interaction.

An Alternative Viewpoint: Lev Vygotsky's Scaffolding

As Piaget was forming his theory of cognitive development, Russian psychologist Lev Vygotsky was also studying how children think and learn. He noted that by age 7, they increasingly think in words and use words to solve problems. They do this, he said, by internalizing their culture's language and relying on inner speech (Ferryhough, 2008). Parents who say "No, no!" when pulling a child's hand away from a cake are giving the child a self-control tool. When the child later needs to resist temptation, he may likewise say "No, no!" Second graders who muttered to themselves while doing math problems grasped third-grade math better the following year (Berk, 1994). Whether out loud or inaudibly, talking to themselves helps children control their behavior and emotions and master new skills.

Where Piaget emphasized how the child's mind grows through interaction with the physical environment, Vygotsky emphasized how the child's mind grows through interaction with the *social* environment. If Piaget's child was a young scientist, Vygotsky's was a young apprentice. By mentoring children and giving them new words, parents and others provide a temporary *scaffold* from which children can step to higher levels of thinking (Renninger & Granott, 2005). Language, an important ingredient of social mentoring, provides the building blocks for thinking, noted Vygotsky (who was born the same year as Piaget, but died prematurely of tuberculosis).

Effective mentoring occurs when children are developmentally ready to learn a new skill. For Vygotsky, a child's *zone of proximal development* was the zone between what a child can and can't do—it's what a child can do with help. When learning to ride a bike, it's the developmental zone in which a child can ride with training wheels or a steadying parental hand.

Reflecting on Piaget's Theory

What remains of Piaget's ideas about the child's mind? Plenty—enough to merit his being singled out by *Time* magazine as one of the twentieth century's 20 most influential scientists and thinkers and rated in a survey of British psychologists as the last century's greatest psychologist (*Psychologist*, 2003). Piaget identified significant cognitive milestones and stimulated worldwide interest in how the mind develops. His emphasis was less on the ages at which children typically reach specific milestones than on their sequence. Studies around the globe, from aboriginal Australia to Algeria to North America, have confirmed that human cognition unfolds basically in the sequence Piaget described (Lourenco & Machado, 1996; Segall et al., 1990).

However, today's researchers see development as more continuous than did Piaget. By detecting the beginnings of each type of thinking at earlier ages, they have revealed conceptual abilities Piaget missed. Moreover, they see formal logic as a smaller part of cognition than he did. Piaget would not be surprised that today, as part of our own cognitive development, we are adapting his ideas to accommodate new findings.

Implications for Parenting and Teaching

Future parents and teachers remember: Young children are incapable of adult logic. Preschoolers who block one's view of the TV simply have not learned to take another's viewpoint. What seems simple and obvious to us—pestering a cat will lead to scratches—may be incomprehensible to a 3-year-old. Also remember that children are not passive receptacles waiting to be filled with knowledge. Better to build on what they already know, engaging them in concrete

"Assessing the impact of Piaget on developmental psychology is like assessing the impact of Shakespeare on English literature." —DEVELOPMENTAL PSYCHOLOGIST HARRY BEILIN (1992)

"Childhood has its own way of seeing, thinking, and feeling, and there is nothing more foolish than the attempt to put ours in its place." —PHILOSOPHER JEAN-JACQUES ROUSSEAU, 1798

demonstrations and stimulating them to think for themselves. And, finally, accept children’s cognitive immaturity as adaptive. It is nature’s strategy for keeping children close to protective adults and providing time for learning and socialization (Bjorklund & Green, 1992).

Before You Move On

► **ASK YOURSELF**

Can you recall a time when you misheard some song lyrics because you assimilated them into your own schema? (For hundreds of examples of this phenomenon, visit www.kissthisguy.com.)

► **TEST YOURSELF**

Use Piaget’s first three stages of cognitive development to explain why children are not just miniature adults in the way they think.

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 47 Review

47-1 From the perspectives of Piaget, Vygotsky, and today’s researchers, how does a child’s mind develop?

- In his theory of *cognitive* development, Jean Piaget proposed that children actively construct and modify their understanding of the world through the processes of *assimilation* and *accommodation*. They form *schemas* that help them organize their experiences.
- Progressing from the simplicity of the *sensorimotor stage* of the first two years, in which they develop *object permanence*, children move to more complex ways of thinking.
- In the *preoperational stage* (about age 2 to about 6 or 7), they develop a *theory of mind*, but they are *egocentric* and unable to perform simple logical operations.
- At age 6 or 7, they enter the *concrete operational stage* and are able to comprehend the principle of *conservation*.
- By about age 12, children enter the *formal operational stage* and can reason systematically.
- Research supports the sequence Piaget proposed, but it also shows that young children are more capable, and their development is more continuous, than he believed.

- Lev Vygotsky’s studies of child development focused on the ways a child’s mind grows by interacting with the social environment. In his view, parents and caretakers provide temporary scaffolds enabling children to step to higher levels of learning.

47-2 How does autism spectrum disorder affect development?

- ASD is marked by social deficiencies and repetitive behaviors.
- Genetic influences contribute to ASD, as does the male hormone testosterone.

TEACH

TRM Common Pitfalls

Students should understand that developmental milestones aren’t etched in stone—in some children they occur earlier, and in some they occur later. Parents who don’t understand these time ranges may endure unnecessary worry and heartache as they wait for their child to develop “on time.” Use Student Activity: Physical Development from the TRM to show students how milestones for physical development are typically measured.

CLOSE & ASSESS

Exit Assessment

Have students differentiate among the different stages in Piaget’s theory of cognitive development and provide concrete examples for each stage.

Answers to Multiple-Choice Questions

1. e 4. b 6. c
 2. c 5. c 7. c
 3. d

Multiple-Choice Questions

- Your friend's baby brother, Matt, loves to play with his pet cat. When he sees a puppy, he points and calls it "Mi Mi," which is what he calls his cat. Matt is demonstrating Piaget's process of
 - conservation.
 - accommodation.
 - cognition.
 - object permanence.
 - assimilation.
- If you showed a 2-year-old that you'd hidden a toy behind the bed in a model of her bedroom, she would not be able to find the toy in her real bedroom because she lacks
 - analytical thinking.
 - random thinking.
 - symbolic thinking.
 - schematic thinking.
 - egocentric thinking.
- Vygotsky called the space between what a child could learn with and without help the
 - theory of mind.
 - zone of abstract logic.
 - zone of abstract reasoning.
 - zone of proximal development.
 - zone of developmental readiness.
- Which of the following is a current belief of researchers that differs from Piaget's original theories?
 - Infants simply have less information about the world than older children and adults.
 - Object permanence develops earlier than Piaget believed.
 - Infants learn more by verbal explanations than Piaget believed.
 - Accommodation is a process that doesn't occur in young children.
 - Schemas don't form until later than Piaget believed.
- Which of the following cognitive abilities is possible only at the formal operational stage?
 - Reversing arithmetic operations
 - Using a theory of mind to predict the behavior of others
 - Using hypothetical situations as the basis of moral reasoning
 - Using symbolic thinking for pretend play
 - Understanding basic physics to recognize impossible situations
- Which of the following identifies children's difficulty seeing another's perspective?
 - Abstract thinker
 - Role player
 - Egocentric thinker
 - A child who understands conservation
 - A child who demonstrates high mental operations
- Which of the following would indicate that a child understood conservation?
 - She would continue to seek a toy hidden under a blanket.
 - She would "hide" in a game of hide-and-seek by covering her eyes with her hands.
 - She would believe that a clay snake would have the same amount of clay as the clay ball that was used to make it.
 - She would recognize that $7 + 3$ involves the same mathematical relationship as $10 - 7$.
 - She would be able to comprehend the logic of if-then statements.

Practice FRQs

1. Describe Lev Vygotsky's ideas on the role of language, scaffolding, and the zone of proximal development in cognitive development. How did his theory differ from that of Jean Piaget?

Answer

1 point: Vygotsky believed that as children grow, they increasingly use words to solve problems and think. Adults help with this process by giving them words to internalize behaviors.

1 point: Scaffolding is the way in which parents and others mentor children to promote cognitive growth, often through providing new words to describe a situation.

1 point: The zone of proximal development marks the border between what children can learn on their own or with help.

1 point: The major difference is that Piaget thought cognitive development resulted from children's interactions with their physical environment, while Vygotsky believed they learned through social interactions.

2. Define and give an example of each of the cognitive milestones listed below:

- Object permanence
- Conservation
- Theory of mind

(3 points)

Answer to Practice FRQ 2

1 point: Object permanence is the awareness that objects continue to exist when not perceived. For example, a child may look for a toy hidden under a blanket.

1 point: Conservation is the principle that properties such as mass, volume, and number remain the same despite changes in the forms of objects. For example, a child who has mastered conservation knows that the amount of liquid does not change when it is poured from a wide glass into a narrow glass.

1 point: Theory of mind relates to children's ability to understand their own and others' mental states. For example, a child's theory of mind would explain how a child could understand what made a playmate angry.



TEACH**TRM Discussion Starter**

Use the Module 48 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH**Teaching Tip**

Explain to students that if they are trying to approach a child with stranger anxiety, they should keep the following in mind:

- *Get permission from his or her parent before approaching.* If the parent greets you in a positive way, the child will be more likely to view you as friendly.
- *Approach the child on his or her level.* Crouch down to the child's eye level so he or she doesn't feel intimidated by your height.
- *Ask him or her to interact with you in a casual way.* For example, ask the child to give you "5" or to tell you what kittens say.
- *If the child is very shy or nervous around you, back off and play with his or her toys.* The child will soon get over his or her inhibitions and play with you.

Module 48

Infancy and Childhood: Social Development

Module Learning Objectives

- 48-1** Describe how parent-infant attachment bonds form.
- 48-2** Describe how psychologists study attachment differences, and discuss their findings about the effect of temperament and parenting.
- 48-3** Discuss how childhood neglect, abuse, or family disruption affect children's attachments.
- 48-4** Discuss the effect of day care on children.
- 48-5** Trace the onset and development of children's self-concept.
- 48-6** Describe three parenting styles, and explain how children's traits relate to them.

**48-1** How do parent-infant attachment bonds form?

From birth, babies in all cultures are social creatures, developing an intense bond with their caregivers. Infants come to prefer familiar faces and voices, then to coo and gurgle when given a parent's attention. At about 8 months, soon after object permanence emerges and children become mobile, a curious thing happens: They develop **stranger anxiety**. They may greet strangers by crying and self-protectively reaching for familiar caregivers. "No! Don't leave me!" their distress seems to say. Children this age have schemas for familiar faces; when they cannot assimilate the new face into these remembered schemas, they become distressed (Kagan, 1984). Once again, we see an important principle: *The brain, mind, and social-emotional behavior develop together.*

stranger anxiety the fear of strangers that infants commonly display, beginning by about 8 months of age.

attachment an emotional tie with another person; shown in young children by their seeking closeness to the caregiver and showing distress on separation.

Origins of Attachment

One-year-olds typically cling tightly to a parent when they are frightened or expect separation. Reunited after being apart, they shower the parent with smiles and hugs. No social behavior is more striking than the intense and mutual infant-parent bond. This **attachment** bond is a powerful survival impulse that keeps infants close to their caregivers. Infants become attached to those—typically their parents—who are comfortable and familiar. For many years, psychologists reasoned that infants became attached to those who satisfied their need for nourishment. It made sense. But an accidental finding overturned this explanation.

Body Contact

During the 1950s, University of Wisconsin psychologists Harry Harlow and Margaret Harlow bred monkeys for their learning studies. To equalize experiences and to isolate any disease, they separated the infant monkeys from their mothers shortly after birth and raised them in sanitary individual cages, which included a cheesecloth baby blanket (Harlow et al., 1971). Then came a surprise: When their blankets were taken to be laundered, the monkeys became distressed.

The Harlows recognized that this intense attachment to the blanket contradicted the idea that attachment derives from an association with nourishment. But how could they show this more convincingly? To pit the drawing power of a food source against the contact comfort of the blanket, they created two artificial mothers. One was a bare wire cylinder with a wooden head and an attached feeding bottle, the other cylinder wrapped with terry cloth.

When raised with both, the monkeys overwhelmingly preferred the comfy cloth mother (**FIGURE 48.1**). Like other infants clinging to their live mothers, the monkey babies would cling to their cloth mothers when anxious. When exploring their environment, they used her as a *secure base*, as if attached to her by an invisible elastic band that stretched only so far before pulling them back. Researchers soon learned that other qualities—rocking, warmth, and feeding—made the cloth mother even more appealing.

Human infants, too, become attached to parents who are soft and warm and who rock, feed, and pat. Much parent–infant emotional communication occurs via touch (Hertenstein et al., 2006), which can be either soothing (snuggles) or arousing (tickles). Human attachment also consists of one person providing another with a secure base from which to explore and a safe haven when distressed. As we mature, our secure base and safe haven shift—from parents to peers and partners (Cassidy & Shaver, 1999). But at all ages we are social creatures. We gain strength when someone offers, by words and actions, a safe haven: “I will be here. I am interested in you. Come what may, I will support you” (Crowell & Waters, 1994).

Familiarity

Contact is one key to attachment. Another is familiarity. In many animals, attachments based on familiarity form during a **critical period**—an optimal period when certain events must take place to facilitate proper development (Bornstein, 1989). For goslings, ducklings, or chicks, that period falls in the hours shortly after hatching, when the first moving object they see is normally their mother. From then on, the young fowl follow her, and her alone.

Konrad Lorenz (1937) explored this rigid attachment process, called **imprinting**. He wondered: What would ducklings do if he was the first moving creature they observed? What they did was follow him around: Everywhere that Konrad went, the ducks were sure to go. Although baby birds imprint best to their own species, they also will imprint to a variety of moving objects—an animal of another species, a box on wheels, a bouncing ball (Colombo, 1982; Johnson, 1992). Once formed, this attachment is difficult to reverse.



Figure 48.1
The Harlows' monkey mothers
Psychologists Harry Harlow and Margaret Harlow raised monkeys with two artificial mothers—one a bare wire cylinder with a wooden head and an attached feeding bottle, the other a cylinder with no bottle but covered with terry cloth and wrapped with terry cloth. The Harlows' discovery surprised many psychologists: The infants much preferred contact with the comfortable cloth mother, even while feeding from the nourishing mother.

FYI

For some people, a perceived relationship with God functions as do other attachments, by providing a secure base for exploration and a safe haven when threatened (Granqvist et al., 2010; Kirkpatrick, 1999).

critical period an optimal period early in the life of an organism when exposure to certain stimuli or experiences produces normal development.

imprinting the process by which certain animals form strong attachments during an early-life critical period.

ENGAGE

Enrichment

The Harlows' work on parental love came about during a time when psychologists and physicians believed that isolating children would protect them from disease. The Harlows went against the establishment in psychology, which at that time was centered on a behaviorist view of “if it can't be seen, it shouldn't be studied.”

ENGAGE

Active Learning

The Harlows went further in their research and studied the effects of abuse and neglect on infants. They would subject their monkeys to isolation, neglect, and even abuse to see if they adapted and what their responses would be. Have students explore these issues that the Harlows' research uncovered.

- Should the same ethical constraints be imposed on animal research that exist for human participants? Why or why not?
- Did the Harlows' studies imply that women should be the primary caregivers for infants? Why or why not?

ENGAGE

Active Learning

Have students explore the relationship between premature birth and parental contact. Have them interview a local obstetrician, pediatrician, or neonatal physician about the health care procedures for infants born prematurely, both in the past and today.

- What illnesses are premature infants prone to?
- How can human contact affect a newborn's health? What biological processes does human contact seem to impact?

TEACH

Concept Connections

Link *familiarity* to social psychology (Unit XIV) by reminding students that the concept relates to the principle of the mere exposure effect. This effect demonstrates that being around an object long enough will cause one to develop an affection for the object. We tend to find objects, people, and places appealing and comfortable because we are around these things for extended periods of time. Have students reflect on times when they have experienced this affect, for instance, when they've grown fond of a song they initially found annoying.

Imprinting Whooping cranes normally learn to migrate by following their parents. These cranes, hand-raised from eggs, have imprinted on a crane-costumed ultralight pilot, who then guided them to winter nesting grounds (Mooallem, 2009).



Mark Peterson/Redux

Children—unlike ducklings—do not imprint. However, they do become attached, during a less precisely defined *sensitive period*, to what they've known. *Mere exposure* to people and things fosters fondness (see Module 79). Children like to reread the same books, rewatch the same movies, reenact family traditions. They prefer to eat familiar foods, live in the same familiar neighborhood, attend school with the same old friends. You may even have noticed your own preference for familiar music, familiar daily routines, and familiar class seating locations. Familiarity is a safety signal. Familiarity breeds content.

ENGAGE

TRM Enrichment

Mary Ainsworth worked for much of her career with John Bowlby, another leading figure in developmental psychology. It was Bowlby who developed the idea of separation anxiety. He believed this feeling was different from fear, which resulted from environmental cues, and different from anger or hostility, which resulted from being rejected by parents and family. Use Student Activity: Social Development from the TRM to help students explore how children develop socially at a young age.

TEACH

Teaching Tip

It is important to remind students that children are usually distressed when their parents leave them, so being distressed at a parent's absence is not a sign of weak attachment. How infants behave when their parents are absent and how they react when their parents return from being absent indicates the level of attachment.

temperament a person's characteristic emotional reactivity and intensity.

AP® Exam Tip

Note that temperament is a contribution from the nature side of the nature-nurture debate.

Attachment Differences: Temperament and Parenting

48-2 How have psychologists studied attachment differences, and what have they learned about the effects of temperament and parenting?

What accounts for children's attachment differences? To answer this question, Mary Ainsworth (1979) designed the *strange situation* experiment. She observed mother-infant pairs at home during their first 6 months. Later she observed the 1-year-old infants in a strange situation (usually a laboratory playroom). Such research has shown that about 60 percent of infants display *secure attachment*. In their mother's presence they play comfortably, happily exploring their new environment. When she leaves, they become distressed; when she returns, they seek contact with her.

Other infants avoid attachment or show *insecure attachment*, marked either by anxiety or avoidance of trusting relationships. They are less likely to explore their surroundings; they may even cling to their mother. When she leaves, they either cry loudly and remain upset or seem indifferent to her departure and return (Ainsworth, 1973, 1989; Kagan, 1995; van IJzendoorn & Kroonenberg, 1988).

Ainsworth and others found that sensitive, responsive mothers—those who noticed what their babies were doing and responded appropriately—had infants who exhibited secure attachment (De Wolff & van IJzendoorn, 1997). Insensitive, unresponsive mothers—mothers who attended to their babies when they felt like doing so but ignored them at other times—often had infants who were insecurely attached. The Harlows' monkey studies, with unresponsive artificial mothers, produced even more striking effects. When put in strange situations without their artificial mothers, the deprived infants were terrified (**FIGURE 48.2**).

But is attachment style the *result* of parenting? Or is attachment style the result of genetically influenced **temperament**—a person's characteristic emotional reactivity and intensity?

As most parents will tell you after having their second child, babies differ even before gulping their first breath. Heredity predisposes temperament differences (Rothbart, 2007).

ENGAGE

TRM Active Learning

Have students discuss whether our temperament influences our caregivers, or whether our caregivers influence our temperament. According to the research cited here, a child's temperament may affect how their parents interact with them. Use Student Activity: Temperament on the Web from the TRM to help students further understand this concept.

TEACH

Flip It

Students can get additional help understanding attachment styles by watching the Flip It Video: Attachment Styles and Parenting.

From their first weeks of life, some infants are reactive, intense, and fidgety. Others are easygoing, quiet, and placid. *Difficult* babies are more irritable, intense, and unpredictable. *Easy* babies are cheerful, relaxed, and predictable in feeding and sleeping. *Slow-to-warm-up* infants tend to resist or withdraw from new people and situations (Chess & Thomas, 1987; Thomas & Chess, 1977). And temperament differences typically persist. Consider:

- The most emotionally reactive newborns tend also to be the most reactive 9-month-olds (Wilson & Matheny, 1986; Worobey & Blajda, 1989).
- Exceptionally inhibited and fearful 2-year-olds often are still relatively shy as 8-year-olds; about half will become introverted adolescents (Kagan et al., 1992, 1994).
- The most emotionally intense preschoolers tend to be relatively intense young adults (Larsen & Diener, 1987). In one study of more than 900 New Zealanders, emotionally reactive and impulsive 3-year-olds developed into somewhat more impulsive, aggressive, and conflict-prone 21-year-olds (Caspi, 2000).

The genetic effect appears in physiological differences. Anxious, inhibited infants have high and variable heart rates and a reactive nervous system. When facing new or strange situations, they become more physiologically aroused (Kagan & Snidman, 2004). One form of a gene that regulates the neurotransmitter serotonin predisposes a fearful temperament and, in combination with unsupportive caregiving, an inhibited child (Fox et al., 2007). Such evidence adds to the emerging conclusion that our biologically rooted temperament helps form our enduring personality (McCrae et al., 2000, 2007; Rothbart et al., 2000).

By neglecting such inborn differences, the parenting studies, noted Judith Harris (1998), are like “comparing foxhounds reared in kennels with poodles reared in apartments.” So to separate nature and nurture, we would need to vary parenting while controlling temperament. (Pause and think: If you were the researcher, how might you have done this?)

One Dutch researcher’s solution was to randomly assign 100 temperamentally difficult 6- to 9-month-olds to either an experimental group, in which mothers received personal training in sensitive responding, or to a control group, in which they did not (van den Boom, 1990, 1995). At 12 months of age, 68 percent of the infants in the experimental group were rated securely attached, as were only 28 percent of the control group infants. Other studies support the idea that intervention programs can increase parental sensitivity and, to a lesser extent, infant attachment security (Bakermans-Kranenburg et al., 2003; Van Zeijl et al., 2006).

As these examples indicate, researchers have more often studied mother care than father care. Infants who lack a caring mother are said to suffer “maternal deprivation”;



Figure 48.2
Social deprivation and fear
In the Harlows’ experiments, monkeys raised with artificial mothers were terror-stricken when placed in strange situations without those mothers. (Today’s climate of greater respect for animal welfare prevents such primate studies.)



“Oh, he’s cute, all right, but he’s got the temperament of a car alarm.”



Full-time dad Financial analyst Walter Cranford, shown here with his baby twins, is one of a growing number of stay-at-home dads. Cranford says the experience has made him appreciate how difficult the work can be: “Sometimes at work you can just unplug, but with this you’ve got to be going all the time.”

ENGAGE

TRM Enrichment

Mary Ainsworth instituted an experimental procedure called the *Strange Situation* to study attachment. In this procedure, parent and infant are introduced alone to the room. The parent watches while the infant explores. Then a stranger enters, talks with the parent and approaches the infant; the parent leaves inconspicuously.

- *First separation episode:* Stranger’s behavior is geared to that of infant.
- *First reunion episode:* Parent greets and comforts infant, then leaves again.
- *Second separation episode:* Infant is alone.
- *Continuation of second separation episode:* Stranger enters and gears behavior to that of infant.
- *Second reunion episode:* Parent enters, greets infant, and picks up infant; stranger leaves inconspicuously.

Use Student Activity: EAS Temperament Survey from the TRM to help students apply this concept to their lives and assess their own temperament. The survey identifies the different types of attachment that Ainsworth described.

Ainsworth, M.D.S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.

TEACH**Teaching Tip**

As students read on p. 490, Ainsworth suggested 2 main types of attachment: secure and insecure. Parents who are slow or inconsistent in their responses to their children can foster insecure attachments. Have students explore current advice available to new parents about attachment.

- How can parents balance response to needs and a concern with spoiling their infants?
- Do infants cry in different ways to express different needs? How can parents know when their child is crying for a need or crying for attention?
- How can parents foster an easy transition to child care?

TEACH**Diversity Connections**

International adoptions are on the rise in recent years, and concerns about the quality of care in orphanages in foreign countries has increased as adoptive parents must overcome neglect and ill treatment suffered by their new children. Have students explore the policies for international adoptions and the quality of child care in orphanages around the world. Students can present some best practices for orphan care they learn about as they research.

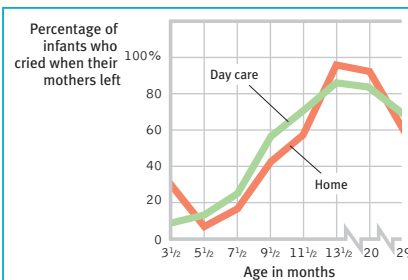


Figure 48.3
Infants' distress over separation from parents In an experiment, groups of infants were left by their mothers in an unfamiliar room. In both groups, the percentage who cried when the mother left peaked at about 13 months. Whether the infant had experienced day care made little difference. (From Kagan, 1976.)



Josko van Keulen/Shutterstock

those lacking a father's care merely experience "father absence." This reflects a wider attitude in which "fathering a child" has meant impregnating, and "mothering" has meant nurturing. But fathers are more than just mobile sperm banks. Across nearly 100 studies worldwide, a father's love and acceptance have been comparable to a mother's love in predicting their offspring's health and well-being (Rohner & Veneziano, 2001). In one mammoth British study following 7259 children from birth to adulthood, those whose fathers were most

involved in parenting (through outings, reading to them, and taking an interest in their education) tended to achieve more in school, even after controlling for other factors such as parental education and family wealth (Flouri & Buchanan, 2004).

Children's anxiety over separation from parents peaks at around 13 months, then gradually declines (FIGURE 48.3). This happens whether they live with one parent or two, are cared for at home or in a day-care center, live in North America, Guatemala, or the Kalahari Desert. Does this mean our need for and love of others also fades away? Hardly. Our capacity for love grows, and our pleasure in touching and holding those we love never ceases. The power of early attachment does nonetheless gradually relax, allowing us to move out into a wider range of situations, communicate with strangers more freely, and stay emotionally attached to loved ones despite distance.

Attachment Styles and Later Relationships

Developmental theorist Erik Erikson (1902–1994), working with his wife, Joan Erikson, believed that securely attached children approach life with a sense of **basic trust**—a sense that the world is predictable and reliable. He attributed basic trust not to environment or inborn temperament, but to early parenting. He theorized that infants blessed with sensitive, loving caregivers form a lifelong attitude of trust rather than fear. (Later, we'll consider Erikson's other stages of development.)

Although debate continues, many researchers now believe that our early attachments form the foundation for our adult relationships and our comfort with affection and intimacy (Birbaum et al., 2006; Fraley et al., 2013). Our adult styles of romantic love tend to exhibit either secure, trusting attachment; insecure, anxious attachment; or the avoidance of attachment (Feeney & Noller, 1990; Rholes & Simpson, 2004; Shaver & Mikulincer, 2007). These adult attachment styles in turn affect relationships with one's own children, as avoidant people find parenting more stressful and unsatisfying (Rholes et al., 2006).

Attachment style is also associated with motivation (Elliot & Reis, 2003). Securely attached people exhibit less fear of failure and a greater drive to achieve. But say this for those (nearly half of all humans) who exhibit insecure attachments: Anxious or avoidant tendencies have helped our groups detect or escape dangers (Ein-Dor et al., 2010).

Deprivation of Attachment

48-3 Does childhood neglect, abuse, or family disruption affect children's attachments?

If secure attachment nurtures social trust, what happens when circumstances prevent a child from forming attachments? In all of psychology, there is no sadder research literature. Babies locked away at home under conditions of abuse or extreme neglect are often withdrawn, frightened, even speechless. The same is true of those raised in institutions without the stimulation and attention of a regular caregiver, as was tragically illustrated during the

"Out of the conflict between trust and mistrust, the infant develops hope, which is the earliest form of what gradually becomes faith in adults." —ERIK ERIKSON (1983)

basic trust according to Erik Erikson, a sense that the world is predictable and trustworthy; said to be formed during infancy by appropriate experiences with responsive caregivers.

"What is learned in the cradle, lasts to the grave." —FRENCH PROVERB



The deprivation of attachment
 In this Romanian orphanage, the 250 children between ages 1 and 5 outnumbered caregivers 15 to 1.

1970s and 1980s in Romania. Having decided that economic growth for his impoverished country required more human capital, Nicolae Ceaușescu, Romania's Communist dictator, outlawed contraception, forbade abortion, and taxed families with fewer than five children. The birthrate indeed skyrocketed. But unable to afford the children they had been coerced into having, many families abandoned them to government-run orphanages with untrained and overworked staff. Child-to-caregiver ratios often were 15 to 1 (and you thought babysitting triplets was a strain), so the children were deprived of healthy attachment with at least one adult. When tested after Ceaușescu was assassinated in 1989, these children had lower intelligence scores and double the 20 percent rate of anxiety symptoms found in children assigned to quality foster care settings (Nelson et al., 2009). Dozens of other studies across 19 countries have confirmed that orphaned children tend to fare better on later intelligence tests if raised in family homes. This is especially so for those placed at an early age (van IJzendoorn et al., 2008).

Most children growing up under adversity (as did the surviving children of the Holocaust) are *resilient*; they withstand the trauma and become normal adults (Helmreich, 1992; Masten, 2001). So do most victims of childhood sexual abuse, noted Harvard researcher Susan Clancy (2010), while emphasizing that using children for sex is revolting and never the victim's fault.

But others, especially those who experience no sharp break from their abusive past, don't bounce back so readily. The Harlows' monkeys raised in total isolation, without even an artificial mother, bore lifelong scars. As adults, when placed with other monkeys their age, they either cowered in fright or lashed out in aggression. When they reached sexual maturity, most were incapable of mating. If artificially impregnated, females often were neglectful, abusive, even murderous toward their first-born. Another primate experiment confirmed the abuse-breeds-abuse phenomenon. In one study, 9 of 16 females who had been abused by their mothers became abusive parents, as did *no* female raised by a nonabusive mother (Maestripieri, 2005).

In humans, too, the unloved may become the unloving. Most abusive parents—and many condemned murderers—have reported being neglected or battered as children (Kempe & Kempe, 1978; Lewis et al., 1988). Some 30 percent of people who have been abused later abuse their children—a rate lower than that found in the primate study, but four times the U.S. national rate of child abuse (Dumont et al., 2007; Kaufman & Zigler, 1987).

Although most abused children do *not* later become violent criminals or abusive parents, extreme early trauma may nevertheless leave footprints on the brain. Abused children exhibit hypersensitivity to angry faces (Pollak, 2008). As adults, they exhibit stronger startle responses (Jovanovic et al., 2009). If repeatedly threatened and attacked while young, normally placid golden hamsters grow up to be cowards when caged with same-sized hamsters, or bullies when caged with weaker ones (Ferris, 1996). Such animals show changes in

ENGAGE

Enrichment

Children who are adopted from orphanages may be behind in their physical development. They may be underweight and lack muscle control. However, once adopted, these children typically catch up in development thanks to better nutrition and more attentive care.

TEACH

Teaching Tip

Some of your students may have been—or currently are—victims of abuse from their parents or caregivers. Be sensitive to this reality and help students see that the cycle of abuse does not have to continue.

TEACH**Concept Connections**

Use this content to remind students about the various neurotransmitters they learned about in Unit III. Especially help them remember the function of the neurotransmitter serotonin, which is linked to depression.

ENGAGE**Enrichment**

Some studies demonstrate that having young children in day care can have health benefits. Children who have been in day care tend to catch colds and viruses more often as toddlers, but they are absent less once they start elementary school. The theory is that spending time in day care as an infant and toddler builds the immune system so that future susceptibility to colds and viruses is minimized. Have students research other benefits of day care.

An example of high-quality day care Research has shown that young children thrive socially and intellectually in safe, stimulating environments with a ratio of one caregiver for every three or four children.



AP Photo/Imperial Valley Press, Dan Himmelfarb

the brain chemical serotonin, which calms aggressive impulses. A similarly sluggish serotonin response has been found in abused children who become aggressive teens and adults. “Stress can set off a ripple of hormonal changes that permanently wire a child’s brain to cope with a malevolent world,” concluded abuse researcher Martin Teicher (2002).

Such findings help explain why young children who have survived severe or prolonged physical abuse, childhood sexual abuse, or wartime atrocities are at increased risk for health problems, psychological disorders, substance abuse, and criminality (Freyd et al., 2005; Kendall-Tackett et al., 1993, 2004; Wegman & Stetler, 2009). Abuse victims are at considerable risk for depression *if* they carry a gene variation that spurs stress-hormone production (Bradley et al., 2008). As we will see again and again, behavior and emotion arise from a particular environment interacting with particular genes.

Adults also suffer when attachment bonds are severed. Whether through death or separation, a break produces a predictable sequence. Agitated preoccupation with the lost partner is followed by deep sadness and, eventually, the beginnings of emotional detachment and a return to normal living (Hazan & Shaver, 1994). Newly separated couples who have long ago ceased feeling affection are sometimes surprised at their desire to be near the former partner. Deep and longstanding attachments seldom break quickly. Detaching is a process, not an event.

Day Care

48-4 How does day care affect children?

In the mid-twentieth century, when mom-at-home was the social norm, researchers asked, “Is day care bad for children? Does it disrupt children’s attachments to their parents?” For the high-quality day-care programs usually studied, the answer was *No*. In *Mother Care/Other Care*, developmental psychologist Sandra Scarr (1986) explained that children are “biologically sturdy individuals . . . who can thrive in a wide variety of life situations.” Scarr spoke for many developmental psychologists, whose research has uncovered no major impact of maternal employment on children’s development, attachments, and achievements (Friedman & Boyle, 2008; Goldberg et al., 2008; Lucas-Thompson et al., 2010).

Research then shifted to the effects of differing quality of day care on different types and ages of children (Vandell et al., 2010). Scarr (1997) explained: Around the world, “high-quality child care consists of warm, supportive interactions with adults in a safe, healthy, and stimulating environment. . . . Poor care is boring and unresponsive to children’s needs.” Even well-run orphanages can produce healthy, thriving children. In Africa and Asia, where more and more children are losing parents to AIDS and other diseases, orphanages typically are unlike those in Ceausescu’s Romania, and the children living in quality orphanages fare about as well as those living in communities (Whetten et al., 2009).

Children’s ability to thrive under varied types of responsive caregiving should not surprise us, given cultural variations in attachment patterns. Westernized attachment features one or two caregivers and their offspring. In other cultures, such as the Efe of Zaire, multiple caregivers are the norm (Field, 1996; Whaley et al., 2002). Even before the mother holds her newborn, the baby is passed among several women. In the weeks to come, the infant will be constantly held (and fed) by other women. The result is strong multiple attachments.

One ongoing study in 10 American cities has followed 1100 children since the age of 1 month. The researchers found that

WORTH

at ages 4½ to 6, children who had spent the most time in day care had slightly advanced thinking and language skills. They also had an increased rate of aggressiveness and defiance (NICHD, 2002, 2003, 2006). To developmental psychologist Eleanor Maccoby (2003), the positive correlation between the increased rate of problem behaviors and time spent in child care suggested “some risk for some children spending extended time in some day-care settings as they’re now organized.” But the child’s temperament, the parents’ sensitivity, and the family’s economic and educational level influenced aggression more than time spent in day care.

There is little disagreement that the children who merely exist for 9 hours a day in understaffed centers deserve better. What all children need is a consistent, warm relationship with people whom they can learn to trust. The importance of such relationships extends beyond the preschool years, as Finnish psychologist Lea Pulkkinen (2006) observed in her career-long study of 285 individuals tracked from age 8 to 42. Her finding—that adult monitoring of children predicts favorable outcomes—led her to undertake, with support from Finland’s parliament, a nationwide program of adult-supervised activities for all first and second graders (Pulkkinen, 2004; Rose, 2004).

Self-Concept

48-5 How do children’s self-concepts develop?

Infancy’s major social achievement is attachment. *Childhood’s* major social achievement is a positive sense of self. By the end of childhood, at about age 12, most children have developed a **self-concept**—an understanding and assessment of who they are. (Their *self-esteem* is how they feel about who they are.) Parents often wonder when and how this sense of self develops. “Is my baby girl aware of herself—does she know she is a person distinct from everyone else?”

Of course we cannot ask the baby directly, but we can again capitalize on what she can do—letting her *behavior* provide clues to the beginnings of her self-awareness. In 1877, biologist Charles Darwin offered one idea: Self-awareness begins when we recognize ourselves in a mirror. To see whether a child recognizes that the girl in the mirror is indeed herself, researchers sneakily dabbed color on the nose. At about 6 months, children reach out to touch their mirror image as if it were another child (Courage & Howe, 2002; Damon & Hart, 1982, 1988, 1992). By 15 to 18 months, they begin to touch their own noses when they see the colored spot in the mirror (Butterworth, 1992; Gallup & Suarez, 1986). Apparently, 18-month-olds have a schema of how their face should look, and they wonder, “What is that spot doing on *my* face?”



Kate Nune/Worm Publishers

Self-awareness Mirror images fascinate infants from the age of about 6 months. Only at about 18 months, however, does the child recognize that the image in the mirror is “me.”



AP Photo/National Academy of Sciences, Courtesy of Joshua Plotnik, Frans de Waal, and Brian Hare

Self-aware animals After prolonged exposure to mirrors, several species—chimpanzees, orangutans, gorillas, dolphins, elephants, and magpies—have similarly demonstrated self-recognition of their mirror image (Gallup, 1970; Reis & Marino, 2001; Prior et al., 2008). In an experiment by Joshua Plotnik and colleagues (2006), Happy, an Asian elephant, when facing a mirror, repeatedly used her trunk to touch an “X” painted above her eye (but not a similar mark above the other eye that was visible only under black light). As one report said, “She’s Happy and she knows it!”

self-concept all our thoughts and feelings about ourselves, in answer to the question, “Who am I?”

TEACH

Active Learning

Contact your local zoo to ask if they ever have given mirrors to the animals. How do the animals react to the mirror? Perhaps your students can take a field trip to the zoo to see the animals’ reactions in person.

TEACH**Interdisciplinary Connections**

Help students remember the different types of parenting styles by associating each with a famous historical figure:

- *Authoritarian* can be associated with any oppressive dictator, from Hitler to Hussein.
- *Permissive* can be associated with the *laissez-faire* type of government that Thomas Jefferson advocated.
- *Authoritative* can be associated with the U.S. President, who is a symbol of democracy, where individuals are expected to be rational and law-abiding.

TEACH**TRM Concept Connections**

Emphasize that correlational studies linking parenting style with certain childhood outcomes do not necessarily reveal cause and effect. For example, children's traits might influence parenting more than vice versa. Use Student Activity: Parental Authority Questionnaire from the TRM so students can assess parental authority from the point of view of the recipient.

AP® Exam Tip

It's understandable if you are struggling to remember the differences between authoritarian and authoritative—these words are exactly the same through the first nine letters! Maybe it will help to realize that authoritative parents will engage in a little more give and take, and that the words *give* and *authoritative* both end in the letters *ive*.

By school age, children's self-concept has blossomed into more detailed descriptions that include their gender, group memberships, psychological traits, and similarities and differences compared with other children (Newman & Ruble, 1988; Stipek, 1992). They come to see themselves as good and skillful in some ways but not others. They form a concept of which traits, ideally, they would like to have. By age 8 or 10, their self-image is quite stable.

Children's views of themselves affect their actions. Children who form a positive self-concept are more confident, independent, optimistic, assertive, and sociable (Maccoby, 1980). So how can parents encourage a positive yet realistic self-concept?

Parenting Styles

4B-6 What are three parenting styles, and how do children's traits relate to them?

Some parents spank, some reason. Some are strict, some are lax. Some show little affection, some liberally hug and kiss. Do such differences in parenting styles affect children?

The most heavily researched aspect of parenting has been how, and to what extent, parents seek to control their children. Investigators have identified three parenting styles:

1. **Authoritarian** parents impose rules and expect obedience: "Don't interrupt." "Keep your room clean." "Don't stay out late or you'll be grounded." "Why? Because I said so."
2. **Permissive** parents submit to their children's desires. They make few demands and use little punishment.
3. **Authoritative** parents are both demanding and responsive. They exert control by setting rules and enforcing them, but they also explain the reasons for rules. And, especially with older children, they encourage open discussion when making the rules and allow exceptions.

Too hard, too soft, and just right, these styles have been called, especially by pioneering researcher Diana Baumrind and her followers. Research indicates that children with the highest self-esteem, self-reliance, and social competence usually have warm, concerned, *authoritative* parents (Baumrind, 1996; Buri et al., 1988; Coopersmith, 1967). Those with authoritarian parents tend to have less social skill and self-esteem, and those with permissive parents tend to be more aggressive and immature. The participants in most studies have been middle-class White families, and some critics suggest that effective parenting may vary by culture. Yet studies with families of other races and in more than 200 cultures worldwide have confirmed the social and academic correlates of loving and authoritative parenting (Rohner & Veneziano, 2001; Sorkhabi, 2005; Steinberg & Morris, 2001). For example, two studies of thousands of Germans found that those whose parents had maintained a curfew exhibited better adjustment and greater achievements in young adulthood than did those with permissive parents (Haase et al., 2008). And the effects are stronger when children are embedded in *authoritative communities* with connected adults who model a good life (Commission on Children at Risk, 2003).

A word of caution: The association between certain parenting styles (being firm but open) and certain childhood outcomes (social competence) is correlational. *Correlation is not causation.* Here are two possible alternative explanations for this parenting-competence link.

- Children's traits may influence parenting. Parental warmth and control vary somewhat from child to child, even in the same family (Holden & Miller, 1999). Perhaps socially mature, agreeable, easygoing children *evoke* greater trust and warmth from their parents. Twin studies have supported this possibility (Kendler, 1996).
- Some underlying third factor may be at work. Perhaps, for example, competent parents and their competent children share genes that predispose social competence. Twin studies have also supported this possibility (South et al., 2008).

Parents who struggle with conflicting advice should remember that *all advice reflects the advice-giver's values*. For those who prize unquestioning obedience from a child, an authoritarian style may have the desired effect. For those who value children's sociability and self-reliance, authoritative firm-but-open parenting is advisable.

Culture and Child Raising

Child-raising practices reflect cultural values that vary across time and place. Do you prefer children who are independent or children who comply? If you live in a Westernized culture, the odds are you prefer independence. "You are responsible for yourself." Western families and schools tell their children. "Follow your conscience. Be true to yourself. Discover your gifts. Think through your personal needs." A half-century and more ago, Western cultural values placed greater priority on obedience, respect, and sensitivity to others (Alwin, 1990; Remley, 1988). "Be true to your traditions," parents then taught their children. "Be loyal to your heritage and country. Show respect toward your parents and other superiors." Cultures can change.

Many Asians and Africans live in cultures that value emotional closeness. Rather than being given their own bedrooms and entrusted to day care, infants and toddlers may sleep with their mothers and spend their days close to a family member (Morelli et al., 1992; Whiting & Edwards, 1988). These cultures encourage a strong sense of *family self*—a feeling that what shames the child shames the family, and what brings honor to the family brings honor to the self.

Children across place and time have thrived under various child-raising systems. Upper-class British parents traditionally handed off routine caregiving to nannies, then sent their 10-year-olds off to boarding school. These children generally grew up to be pillars of British society, as did their parents and their boarding-school peers. In the African Gusii society, babies nurse freely but spend most of the day on their mother's back—with lots of body contact but little face-to-face and language interaction. When the mother becomes pregnant again, the toddler is weaned and handed over to someone else, often an older sibling. Westerners may wonder about the negative effects of this lack of verbal interaction, but then the African Gusii may in turn wonder about Western mothers pushing their babies around in strollers and leaving them in playpens (Small, 1997). Such diversity in child raising cautions us against presuming that our culture's way is the only way to raise children successfully.



Cultures vary Parents everywhere care about their children, but raise and protect them differently depending on the surrounding culture. Parents raising children in New York City keep them close. In Scotland's Orkney Islands' town of Stromness, social trust has enabled parents to park their toddlers outside shops.



Parental involvement promotes development Parents in every culture facilitate their children's discovery of their world, but cultures differ in what they deem important. Asian cultures place more emphasis on school and hard work than do North American cultures. This may help explain why Japanese and Taiwanese children get higher scores on mathematics achievement tests.

TEACH

Diversity Connections

Have students interview people from different cultures about the way they were reared. Have them compare and contrast child-rearing practices in the United States with those of different cultures. If possible, have them interview several people from the same culture, so students can see how development and child rearing may differ within a culture.

- Are the child-rearing practices in the other culture, in general, better or worse than those in the United States?
- Which practices would you adopt for your own children? Which would you reject? Why?

TEACH

Concept Connections

Connect this discussion of culture and child rearing to Unit X's discussion of individualist versus collectivist cultures. Collectivist cultures, such as those in Asia or Africa, often value communal connections and family over individual goals. Individualist cultures, such as the predominant culture in the United States and many European cultures, value individual goals and pride. The values people in these orientations may pass on to their children would likely differ significantly.

CLOSE & ASSESS**Exit Assessment**

Have students propose a research design for a study testing one of the following:

- The influence of parenting styles on development
- The influence of attachment on development
- The best practices for day cares or orphanages

"You are the bows from which your children as living arrows are sent forth." -KAHLIL GIBRAN, *THE PROPHET*, 1923

The investment in raising a child buys many years not only of joy and love but of worry and irritation. Yet for most people who become parents, a child is one's biological and social legacy—one's personal investment in the human future. To paraphrase psychiatrist Carl Jung, we reach backward into our parents and forward into our children, and through their children into a future we will never see, but about which we must therefore care.

Before You Move On**▶ ASK YOURSELF**

How would you describe your own temperament? Is it similar to that of other family members, or quite different?

▶ TEST YOURSELF

What distinguishes imprinting from attachment?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 48 Review**48-1**

How do parent-infant attachment bonds form?

- At about 8 months, soon after object permanence develops, children separated from their caregivers display *stranger anxiety*.
- Infants form *attachments* not simply because parents gratify biological needs but, more important, because they are comfortable, familiar, and responsive.
- Ducks and other animals have a more rigid attachment process, called *imprinting*, that occurs during a *critical period*.

48-2

How have psychologists studied attachment differences, and what have they learned about the effects of temperament and parenting?

- Attachment has been studied in strange situation experiments, which show that some children are securely attached and others are insecurely attached.
- Sensitive, responsive parents tend to have securely attached children.
- Adult relationships seem to reflect the attachment styles of early childhood, lending support to Erik Erikson's idea that *basic trust* is formed in infancy by our experiences with responsive caregivers.

48-3

Does childhood neglect, abuse, or family disruption affect children's attachments?

- Children are very resilient, but those who are moved repeatedly, severely neglected by their parents, or otherwise prevented from forming attachments by an early age may be at risk for attachment problems.

48-4

How does day care affect children?

- Quality day care, with responsive adults interacting with children in a safe and stimulating environment, does not appear to harm children's thinking and language skills.
- Some studies have linked extensive time in day care with increased aggressiveness and defiance, but other factors—the child's temperament, the parents' sensitivity, and the family's economic and educational levels and culture—also matter.

48-5 How do children's self-concepts develop?

- *Self-concept*, an understanding and evaluation of who we are, emerges gradually.
 - At 15 to 18 months, children recognize themselves in a mirror.
 - By school age, they can describe many of their own traits, and by ages 8 to 10 their self-image is stable.

48-6 What are three parenting styles, and how do children's traits relate to them?

- Parenting styles—authoritarian, permissive, and authoritative—reflect varying degrees of control.
- Children with high self-esteem tend to have authoritative parents and to be self-reliant and socially competent, but the direction of cause and effect in this relationship is not clear.

Multiple-Choice Questions

- An 18-month-old typically recognizes herself in a mirror. This self-awareness contributes to
 - self-assurance.
 - self-concept.
 - self-esteem.
 - self-actualization.
 - self-determination.
- In the attachment studies conducted with infant monkeys, what did the Harlows find?
 - Nutrition was the most important factor in attachment.
 - Contact comfort was the most important factor in attachment.
 - The surrogate mother's appearance was the most important attachment factor.
 - Monkeys were equally likely to become attached to either surrogate mother.
 - The monkeys didn't form attachments to the surrogate mothers.
- What do we call an optimal window of opportunity for proper development?
 - Attachment
 - The critical period
 - The social period
 - Imprinting
 - Mere exposure
- Which of the following identifies the parenting style most likely to ground a teen who had missed a curfew—and to explain the rationale for doing so, after considering the teen's reasons?
 - Authoritative
 - Authoritarian
 - Permissive
 - Secure attachment
 - Insecure attachment
- Which of the following would be considered a sign of secure attachment in a 1-year-old?
 - Showing no sign of stranger anxiety, whether the parent is present or not
 - Paying no attention to a parent who returns after a brief separation
 - Showing anger at the parent after a brief separation
 - Becoming distressed when the parent leaves and seeking contact on return
 - Not reacting to a parent leaving or returning after a brief separation
- Who identified secure and insecure attachment?
 - Sigmund Freud
 - Konrad Lorenz
 - Jean Piaget
 - Mary Ainsworth
 - Jerome Kagan

Practice FRQs

- Name and describe the three types of infant temperaments.
- Name and describe Diana Baumrind's three parenting styles.

(3 points)

Answer

1 point: Easy: These babies are easygoing, cheerful, predictable, and placid.

1 point: Difficult: These babies are emotionally reactive, intense, irritable, and unpredictable.

1 point: Slow to warm up: These babies resist and withdraw from new people or situations.

Answers to Multiple-Choice Questions

1. b 3. b 5. d
 2. b 4. a 6. d

Answer to Practice FRQ 2

1 point: Authoritarian parents impose rules and expect obedience.

1 point: Permissive parents submit to their children's desires.

1 point: Authoritative parents are both demanding and responsive.

TEACH**TRM Discussion Starter**

Use the Module 49 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH**Common Pitfalls**

Help students use the following terms correctly:

- *Sex* refers to the strictly biological traits that define male and female. When discussing someone's physical designation as male or female, we should use the term *sex*.
- *Gender* includes both biological traits and social characteristics. When discussing the biological and social ways in which people are male or female, we should use the term *gender*.

TEACH**Common Pitfalls**

Students may insist that differences between men and women are large, citing their own anecdotal evidence for their belief. Remind students that “[t]he plural of anecdote is not data” (Frank Kotsonis). Simply because we have a validating story does not mean the wide collection of data will support the story. Individual variation does occur, but such variation does not represent a wider truth.

Module 49

Gender Development

Module Learning Objectives

- 49-1** Discuss gender similarities and differences in psychological traits.
- 49-2** Discuss the importance of gender roles and gender typing in development.



gender the socially constructed roles and characteristics by which a culture defines *male* and *female*.

FYI

Pink and blue baby outfits offer another example of how cultural norms vary and change. “The generally accepted rule is pink for the boy and blue for the girl,” declared the publication *Earnshaw’s Infants’ Department* in June 1918 (Maglaty, 2011). “The reason is that pink being a more decided and stronger color is more suitable for the boy, while blue, which is more delicate and dainty, is prettier for the girls.”

AP® Exam Tip

There is a lot of information in this section. One good way to process these differences and similarities between genders is to consider which facts fit prevailing stereotypes and which don’t. You may even want to keep a list.

As we saw in Module 34, we humans share an irresistible urge to organize our worlds into simple categories. Among the ways we classify people—as tall or short, fat or slim, smart or dull—one stands out: Before or at your birth, everyone wanted to know, “Boy or girl?” From that time on, your sex (your biological status, defined by your chromosomes and anatomy) helped define your **gender**, the socially constructed roles and characteristics by which your culture defines *male* and *female*. Guided by our culture, our gender influences our social development.

How Are We Alike? How Do We Differ?

- 49-1** What are some gender similarities and differences in aggression, social power, and social connectedness?

Having faced similar adaptive challenges, we are in most ways alike. Tell me whether you are male or female and you give me virtually no clues to your vocabulary, intelligence, and happiness, or to the mechanisms by which you see, hear, learn, and remember. Your “opposite” sex is, in reality, your very similar sex. At conception, you received 23 chromosomes from your mother and 23 from your father. Of those 46 chromosomes, 45 are unisex—the same for males and females. (In Module 53, we’ll return to that forty-sixth chromosome.)

But males and females do differ, and differences command attention—stimulating more than 18,000 studies (Ellis et al., 2008). Some much-talked-about gender differences are actually quite modest, as Janet Shibley Hyde (2005) illustrated by graphically representing male and female self-esteem scores across many studies (**FIGURE 49.1**). Other differences are more striking. Compared with the average man, the average woman enters puberty 2 years sooner, and her life span is 5 years longer. She carries 70 percent more fat, has 40 percent less muscle, and is 5 inches shorter. She expresses emotions more freely, can smell fainter odors, and is offered help more often. She can become sexually re-aroused soon after orgasm. She is also doubly vulnerable to depression and anxiety, and her risk of developing an eating disorder is 10 times greater than the average man’s. Yet, he is some 4 times more likely to commit suicide or develop alcohol use disorder. He is also more likely to be diagnosed with autism spectrum disorder, color-blindness, attention-deficit/hyperactivity disorder as a child, and antisocial personality disorder as an adult. Choose your gender and pick your vulnerability.

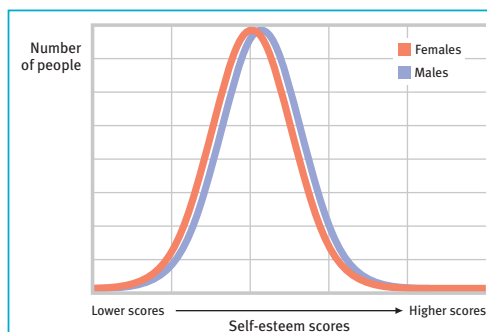


Figure 49.1
Much ado about a small difference in self-esteem These two normal distributions differ by the approximate magnitude of the gender difference in self-esteem, averaged over all available samples (Hyde, 2005). Moreover, such comparisons illustrate differences between the average woman and man. The variation among individual women greatly exceeds this difference, as it also does among individual men.

Gender differences appear throughout this book. For now, let's consider some gender differences in aggression, social power, and social connectedness. (Note that these differences between the *average* woman and man do not necessarily describe any individual woman or man.)

Gender and Aggression

In surveys, men admit to more **aggression** than women do. This aggression gender gap pertains to harmful physical aggression, rather than indirect or verbal relational aggression such as ostracism or spreading rumors. As John Archer (2004, 2006, 2009) has noted, based on statistical digests of dozens of studies, women may be slightly more likely to commit acts of relational aggression, such as passing along malicious gossip. The gap appears in everyday life at various ages and in various cultures, especially cultures with gender inequality (Archer, 2009).

Men's tendency to behave more aggressively can be seen in experiments where they deliver what they believe are more painful electric shocks (Card et al., 2008). Violent crime rates illustrate the gender difference even more strikingly. The male-to-female arrest ratio for murder, for example, is 9 to 1 in the United States and 8 to 1 in Canada (FBI, 2009; Statistics Canada, 2010). Throughout the world, fighting, warring, and hunting are primarily men's activities (Wood & Eagly, 2002, 2007). Men also express more support for war. The Iraq war, for example, was consistently supported more by American men than by American women (Newport et al., 2007).

Gender and Social Power

Close your eyes and imagine two adults standing side by side. The one on the left is dominant, forceful, and independent. The one on the right is submissive, nurturing, and socially connected.

Did you see the person on the left as a man, and the one on the right as a woman? If so, you are not alone.

Around the world, from Nigeria to New Zealand, people perceive such power differences between men and women (Williams & Best, 1990). Indeed, in most societies men *do* place more importance on power and achievement and *are* socially dominant (Schwartz &



Gender difference in aggression Around the world, fighting, violent crime, and blowing things up are mostly men's activities. This is why many were surprised to hear that female suicide bombers were responsible for the 2010 Moscow subway bombing that killed dozens.

aggression any physical or verbal behavior intended to hurt or destroy.

TEACH

Concept Connections

Use Figure 49.1 to remind students about the qualities of a normal curve.

- In a normal curve, the mean, median, and mode are all the same number.
- The standard deviation tells us how peaked or shallow the curve is. The larger the standard deviation, the flatter the curve. The smaller the standard deviation, the more peaked the curve.
- Notice on the curve that there are scores that are at the extremes of each side. There are men and women who are vastly different from one another. However, the majority of men and women do not differ significantly.

TEACH

Concept Connections

Have students discuss what evolutionary advantages there might be for gender differences such as aggression and social connectedness. How might men who are aggressive be more likely to survive? How might women who are more socially connected be more likely to survive?

TEACH**Concept Connections**

Have students use their knowledge of the development of stereotypes and prejudice to discuss why women may not hold many positions of power in governments around the world. Discuss how generalizations about women (e.g., they are moody due to hormones; they are too emotional) may contribute to this imbalance of power.

ENGAGE**Active Learning**

Have students take a sample of one day's postings on a social network site (Facebook, Twitter, Tumblr, Instagram, etc.) and count the number of posts by their male and female friends. Collect the data as a class to see if significant gender differences emerge. Students can extend this by counting the number of texts they send during a week to people of both genders.

FYI

Women's 2011 representation in national parliaments ranged from 11 percent in the Arab States to 42 percent in Scandinavia (IPU, 2011).

FYI

Question: Why does it take 200 million sperm to fertilize one egg?
Answer: Because they won't stop for directions.

Rubel-Lifschitz, 2009). When groups form, whether as juries or companies, leadership tends to go to males (Colarelli et al., 2006). When salaries are paid, those in traditionally male occupations receive more. And when political leaders are elected, they usually are men, who held 80 percent of the seats in the world's governing parliaments in 2011 (IPU, 2011). If perceived to be hungry for political power (thus violating gender norms), women more than men suffer voter backlash (Okimoto & Brescoll, 2010). Men's power hunger is more expected and accepted.

As leaders, men tend to be more *directive*, even autocratic. Women tend to be more *democratic*, more welcoming of subordinates' input in decision making (Eagly & Carli, 2007; van Engen & Willemssen, 2004). When people interact, men are more likely to utter opinions, women to express support (Aries, 1987; Wood, 1987). In everyday behavior, men tend to act as powerful people often do: They are more likely to talk assertively, interrupt, initiate touches, and stare. And they smile and apologize less (Leaper & Ayres, 2007; Major et al., 1990; Schumann & Ross, 2010). Such behaviors help sustain social power inequities.

Gender and Social Connectedness

In the 1980s, many developmental psychologists believed that all children struggle to create a separate, independent identity. Research by Carol Gilligan and her colleagues (1982, 1990), however, suggested that this struggle describes Western individualist males more than relationship-oriented females. Gilligan believed females tend to differ from males both in being less concerned with viewing themselves as separate individuals and in being more concerned with "making connections." Indeed, later research has found that females are more *interdependent* than males, and this difference surfaces early. In children's play, boys typically form large groups. Their games tend to be active and competitive, with little intimate discussion (Rose & Rudolph, 2006). Studies have found that girls usually play in smaller groups, often with one friend. Their play is less competitive and more imitative of social relationships (Maccoby, 1990; Roberts, 1991).

As adults, women take more pleasure in talking face to face, and they more often use conversation to explore relationships. Men enjoy doing activities side by side and tend to use conversation to communicate solutions (Tannen, 1990; Wright, 1989). The communication difference is apparent in student e-mails: In one New Zealand study, people could correctly guess the author's gender two-thirds of the time (Thomson & Murachver, 2001).

Gender differences also appear in phone-based communication. In the United States, the average teen girl sends double the number of text messages of the average teen boy (Lenhart, 2010). In France, women have made 63 percent of phone calls and, when talking to a woman, stayed connected longer (7.2 minutes) than have men when talking to other men (4.6 minutes) (Smoreda & Licoppe, 2000).

Every man for himself, or tend and befriend?
Gender differences in the way we interact with others begin to appear at a very young age.



Women worldwide have oriented their interests and vocations more to people and less to things (Eagly, 2009; Lippa, 2005, 2006, 2008). One analysis of more than a half-million people's responses to various interest inventories revealed that "men prefer working with things and women prefer working with people" (Su et al., 2009). On entering college, American men are seven times more likely than women to express interest in computer science, and they contribute 87 percent of Wikipedia articles (Cohen, 2011; Pryor et al., 2011). In the workplace, women have been less driven by money and status and more often opted for reduced work hours (Pinker, 2008). In the home, they have been five times more likely than men to claim primary responsibility for taking care of children (*Time*, 2009).

Women's emphasis on caring helps explain another interesting finding: Although 69 percent of people have said they have a close relationship with their father, 90 percent said they feel close to their mother (Hugick, 1989). When wanting understanding and someone with whom to share worries and hurts, both men and women usually turn to women, and both have reported their friendships with women to be more intimate, enjoyable, and nurturing (Rubin, 1985; Sapadin, 1988). And when coping with their own stress, women more than men turn to others for support—they *tend and befriend* (Tamres et al., 2002; Taylor, 2002).

Gender differences in social connectedness, power, and other traits peak in late adolescence and early adulthood—the very years most commonly studied (also the years of dating and mating). As teenagers, girls become progressively less assertive and more flirtatious; boys become more domineering and unexpressive. Following the birth of a first child, parents (women especially) become more traditional in their gender-related attitudes and behavior (Ferriman et al., 2009; Katz-Wise et al., 2010). But studies have shown that by age 50, parenthood-related gender differences subside. Men become more empathic and less domineering, and women—especially those with paid employment—become more assertive and self-confident (Kasen et al., 2006; Maccoby, 1998).

What explains our diversity? How much does biology bend the genders? To what extent are we shaped by our cultures? A biopsychosocial view suggests both are important, thanks to the interplay among our biological dispositions, our developmental experiences, and our current situations (Eagly, 2009).

The Nurture of Gender: Our Culture

49-2 How do gender roles and gender typing influence gender development?

For most people, their biological sex and their gender are **tightly** intertwined. What biology initiates (as we will see in Module 53), culture accentuates.

Gender Roles

Culture is everything shared by a group and transmitted across generations. We can see culture's shaping power in **gender roles**—the social expectations that guide men's and women's behavior. (In psychology, as in the theater, a **role** refers to a cluster of prescribed actions, the behaviors we expect of those who occupy a particular social position.)

Gender roles vary over time and place. In North America, men were traditionally expected to initiate dates, drive the car, and pick up the check. Women were expected to decorate the home, buy and care for the children's clothes, and select the wedding gifts. Up through the 1990s, Mom (about 90 percent of the time in two-parent U.S. families) stayed home with a sick child, arranged for the babysitter, and called the doctor (Maccoby, 1995). Even in recent years, compared with employed women, employed men in the United States have daily spent about an hour and a half more on

"In the long years liker must they grow; The man be more of woman, she of man." -ALFRED LORD TENNYSON, *THE PRINCESS*, 1847

gender role a set of expected behaviors for males or for females.

role a set of expectations (norms) about a social position, defining how those in the position ought to behave.

"Sex brought us together, but gender drove us apart."

ENGAGE

Applying Science

Have your students watch a short clip from a television show or movie and write a summary of what the clip was about. Students should only put their gender as identification on the paper. Collect these summaries and distribute them back to students randomly. Have students count the number of words used in the summary. They should add their data to a spreadsheet or whiteboard so you can calculate the differences in word usage between girls and boys.

TEACH

Teaching Tip

Have students discuss the questions Myers proposed at the end of this section. How might they answer these questions if they came up on the AP® exam?

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TEACH**Teaching Tip**

Have students brainstorm about different gender expectations and roles they subscribe to in their generation. How many of these expectations and roles come from their parents? How many come from the prevailing culture? How many buck the trends of previous generations? Have students analyze social media posts from both girls and boys to see if a gender difference emerges.

TEACH**Concept Connections**

The anxiety we might feel when we do not follow social roles results from normative social influence (more on this in Unit XIV). With normative social influence, people behave in ways that gain acceptance from others. When they do not behave in socially expected ways, others will shun them or disapprove, provoking feelings of anxiety.

ENGAGE**Enrichment**

Albert Bandura is a primary name to connect with social learning theory. He is one of the 20th-century's most prolific and influential psychologists, providing psychology with not only social learning theory, but reciprocal determinism, self-efficacy, and observational learning with the famous Bobo doll study (covered in Unit VI).

The gendered tsunami In Sri Lanka, Indonesia, and India, the gendered division of labor helps explain the excess of female deaths from the 2004 tsunami. In some villages, 80 percent of those killed were women, who were mostly at home while the men were more likely to be at sea fishing or doing out-of-the-home chores (Oxfam, 2005).



DPX/The Image Works

the job and about one hour less on household activities and caregiving (Amato et al., 2007; Bureau of Labor Statistics, 2004; Fisher et al., 2006). Ditto Australia, where, compared with men, women have devoted 54 percent more time to unpaid household work and 71 percent more time to child care (Trewin, 2001).

Other societies have different expectations. In nomadic societies of food-gathering people, there is little division of labor by sex. Boys and girls receive much the same upbringing. In agricultural societies, where women work in the nearby fields and men roam while herding livestock, children have typically been socialized into more distinct gender roles (Segall et al., 1990; Van Leeuwen, 1978).

Among industrialized countries, gender roles and attitudes vary widely. Australia and the Scandinavian countries offer the greatest gender equity, Middle Eastern and North African countries the least (Social Watch, 2006). And consider: Would you agree that “when jobs are scarce, men should have more rights to a job?” In the United States, Britain, and Spain, about one in eight adults agree. In Nigeria, Pakistan, and India, about four in five do (Pew, 2010). We are one species, but my, how we differ.

To see how gender role attitudes vary over time, consider women's voting rights. At the opening of the twentieth century, only one country—New Zealand—granted women the right to vote (Briscoe, 1997). By the late 1960s and early 1970s, women had become a force in the voting booth and the workplace in many countries. Nearly 50 percent of employed Americans are now women, as are 54 percent of college graduates, up from 36 percent in just four decades (Fry & Cohn, 2010). In today's postindustrial economy, the jobs expected to grow the most in the years ahead are the ones women have gravitated toward—those that require not size and strength but social intelligence, open communication, and the ability to sit still and focus (Rosin, 2010). These are big gender changes in but a thin slice of history.

Gender roles can smooth social relations, avoiding irritating discussions about whose job it is to get the car fixed and who should buy the birthday presents. But these quick and easy assumptions come at a cost: If we deviate from conventions, we may feel anxious.

How Do We Learn to Be Male or Female?

Gender identity is a person's sense of being male or female. **Social learning theory** assumes that children acquire this identity by observing and imitating others' gender-linked behaviors and by being rewarded or punished for acting in certain ways themselves (“Nicole, you're such a good mommy to your dolls”; “Big boys don't cry, Alex.”). Some critics have objected, saying that parental modeling and rewarding of male-female differences aren't enough to explain **gender typing**, the way some children seem more attuned than others to traditional male or female roles (Lytton & Romney, 1991). In fact, even in families that discourage traditional gender typing, children organize themselves into “boy worlds” and “girl worlds,” each guided by rules for what boys and girls do.

Cognition (thinking) also matters. In your own childhood you formed concepts that helped you make sense of your world. One of these was your *gender schema*, your framework for organizing boy-girl characteristics (Bem, 1987, 1993). This gender schema then became a lens through which you viewed your experiences.

Gender schemas form early in life, and social learning helps form them. Before age 1, you began to discriminate male and female voices and faces (Martin et al., 2002). After age 2, language forced you to begin organizing your world on the basis of gender. English, for example, uses the pronouns *he* and *she*; other languages classify objects as masculine (“*le train*”) or feminine (“*la table*”).

FYI

In Module 30, we explored how children can learn—including the aggressive behavior modeled in Albert Bandura's famous Bobo doll experiment—by observing others.

gender identity our sense of being male or female.

social learning theory the theory that we learn social behavior by observing and imitating and by being rewarded or punished.

gender typing the acquisition of a traditional masculine or feminine role.

WORTH

Young children are “gender detectives” (Martin & Ruble, 2004). Once they grasp that two sorts of people exist—and that they are of one sort—they search for clues about gender, and they find them in language, dress, toys, and songs. Girls, they may decide, are the ones with long hair. Having divided the human world in half, 3-year-olds will then like their own kind better and seek them out for play. And having compared themselves with their concept of gender, they will adjust their behavior accordingly. (“I am male—thus, masculine, strong, aggressive,” or “I am female—therefore, feminine, sweet, and helpful.”) These rigid boy-girl stereotypes peak at about age 5 or 6. If the new neighbor is a boy, a 6-year-old girl may assume he just cannot share her interests. For young children, gender looms large.



Courtesy of David Myers

The social learning of gender Children observe and imitate parental models.

For some people, comparing themselves with their culture’s concepts of gender produces feelings of confusion and discord. **Transgender** people’s *gender identity* (their sense of being male or female) or *gender expression* (their communication of gender identity through behavior or appearance) differs from that typical of their birth sex (APA, 2010). A person may feel like a man in a woman’s body, or a woman in a man’s body. These include *transsexual* people, who live, or wish to live, as members of the gender opposite to their birth sex, often aided by medical treatment that supports gender reassignment. Note that gender identity is distinct from *sexual orientation* (the direction of one’s sexual attraction). Transgender people may be heterosexual, homosexual, bisexual, or asexual.

Some transgender persons express their gender identity by dressing as a person of the other biological sex typically would. Most cross-dressers are biological males, the majority of whom feel an attraction to females (APA, 2010).



Transgender contestant In 2012, Jenna Talackova became the first transgender beauty pageant contestant in this Miss Universe Canada contest in Toronto. Talackova was born a male but had sex-reassignment surgery.

“The more I was treated as a woman, the more woman I became.” -WRITER JAN MORRIS, MALE-TO-FEMALE TRANSEXUAL

AP Photo/The Canadian Press, Aaron Vincent/Etham

transgender an umbrella term describing people whose gender identity or expression differs from that associated with their birth sex.

Before You Move On

▶ ASK YOURSELF

Do you consider yourself strongly gender typed or not strongly gender typed? What factors do you think have contributed to your feelings of masculinity or femininity?

▶ TEST YOURSELF

What are gender roles, and what do their variations tell us about our human capacity for learning and adaptation?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

TEACH

Concept Connection

Remind students that earlier in the unit (Module 47), they learned about Jean Piaget and his conceptualization of schemas. Students need to remember how schemas are developed—through the processes of assimilation and accommodation.

TEACH

Common Pitfalls

Students may be uncomfortable or insensitive discussing transgender issues in class. Help students focus on the psychology content taught in this section.

CLOSE & ASSESS

Exit Assessment

Have students list the similarities and differences that research shows exist between males and females. Make sure they focus on research-based differences.

Module 49 Review

49-1 What are some gender similarities and differences in aggression, social power, and social connectedness?

- *Gender* refers to the socially constructed roles and characteristics by which a culture defines “male” and “female.”
- We are more alike than different, thanks to our similar genetic makeup—we see, hear, learn, and remember similarly. Males and females do differ in body fat, muscle, height, age of onset of puberty, life expectancy, and vulnerability to certain disorders.
- Men admit to more *aggression* than women do, and they are more likely to be physically aggressive. Women’s aggression is more likely to be relational.
- In most societies, men have more social power, and their leadership style tends to be directive, whereas women’s is more democratic.
- Women focus more on social connectedness, and they “tend and befriend.”

49-2 How do gender roles and gender typing influence gender development?

- *Gender roles*, the behaviors a culture expects from its males and females, vary across place and time.
- *Social learning theory* proposes that we learn *gender identity*—our sense of being male or female—as we learn other things: through reinforcement, punishment, and observation. Critics argue that cognition also plays a role because modeling and rewards cannot explain *gender typing*.
- *Transgender* people’s gender identity or expression differs from their birth sex. Their sexual orientation may be heterosexual, homosexual, bisexual, or asexual.

Answers to Multiple-Choice Questions

1. a 3. c 5. b
2. d 4. b

Multiple-Choice Questions

- According to research, which type of aggression is more common among males than females?
 - Harmful physical aggression
 - Indirect nonphysical aggression
 - Verbal aggression
 - Ostracism
 - Spreading rumors
- Gender _____ are the social expectations that guide men and women’s behavior. Gender _____ is a person’s sense of being male or female.
 - concepts; role
 - preferences; role
 - roles; preference
 - roles; identity
 - roles; preference
- Which of the following is generally true of males?
 - They have a longer life span.
 - They are more likely to have a democratic leadership style.
 - They are more likely to commit suicide.
 - They are more likely to be diagnosed with depression.
 - They are more likely to be diagnosed with anxiety.
- Diego likes to play sports and video games whereas Sara likes to sing, dance, and play “house.” This example best depicts which of the following?
 - Gender identity
 - Gender typing
 - Gender schema
 - Social learning theory
 - Gender expression
- Carol Gilligan’s research emphasizes prominent female characteristics, especially
 - spatial abilities.
 - making social connections.
 - playing in large groups.
 - talking a great deal.
 - playing in competitive groups.

Practice FRQs

1. What are gender roles? What are gender schemas? How does social learning contribute to the formation of each?

Answer

1 point: Gender roles are the cultural norms for expected behaviors for males and females.

1 point: Gender schemas are the cognitive ways in which we organize boy-girl characteristics.

1 point: Social learning contributes to gender schema formation by the observation of gender roles, the rewarding of gender-appropriate behaviors, and the ways in which gender is discussed.

2. Give an example of a biological, a psychological, and a social factor that might contribute to gender differences.

(3 points)

Answer to Practice FRQ 2

1 point: Biological: hormones; brain structure/function; physical developmental stages

1 point: Psychological: parents' expectations; peer relationships; personality traits; temperament

1 point: Social: culture norms; values of the society; peer influence; economic status



TEACH**TRM Discussion Starter**

Use the Module 50 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH**Concept Connections**

Use this content as a review of the concepts discussed in Unit III. Help students remember the parts of the brain that are responsible for various behaviors.

TEACH**Concept Connections**

Remind students that it's not the size of the brain that matters: It's the complexity of it. Brains that are more complex have more dendritic interconnections. Enriched brains are not larger than non-enriched brains, they are just more complex. Rosenzweig's research helped shed light on this fact.

Module 50

Parents, Peers, and Early Experiences

Module Learning Objectives

- 50-1** Describe how early experiences can modify the brain.
- 50-2** Describe the ways in which parents and peers shape children's development.



Our genes, as expressed in specific environments, influence our developmental differences. We are not “blank slates,” note Douglas Kenrick and his colleagues (2009). We are more like coloring books, with certain lines predisposed and experience filling in the full picture. We are formed by nature *and* nurture. But what are the most influential components of our nurture? How do our early experiences, our family and peer relationships, and all our other experiences guide our development and contribute to our diversity?

Experience and Brain Development

50-1 How do early experiences modify the brain?

The formative nurture that conspires with nature begins at conception, as we have seen, with the prenatal environment in the womb. Embryos receive differing nutrition and varying levels of exposure to toxic agents. Nurture then continues outside the womb, where our early experiences foster brain development.

Our genes dictate our overall brain architecture, but experience fills in the details, developing neural connections and preparing our brain for thought and language and other later experiences. So how do early experiences leave their “marks” in the brain? Mark Rosenzweig, David Krech, and their colleagues (1962) opened a window on that process when they raised some young rats in solitary confinement and others in a communal playground. When they later analyzed the rats' brains, those raised in the enriched environment, which simulated a natural environment, usually developed a heavier and thicker brain cortex (**FIGURE 50.1**).

Rosenzweig was so surprised by this discovery that he repeated the experiment several times before publishing his findings (Renner & Rosenzweig, 1987; Rosenzweig, 1984). So great are the effects that, shown brief video clips of rats, you could tell from their activity and curiosity whether their environment had been impoverished or enriched (Renner & Renner, 1993). After 60 days in the enriched environment, the rats' brain weights increased 7 to 10 percent and the number of synapses mushroomed by about 20 percent (Kolb & Whishaw, 1998).



Stringing the circuits young
String musicians who started playing before age 12 have larger and more complex neural circuits controlling the note-making left-hand fingers than do string musicians whose training started later (Elbert et al., 1995).

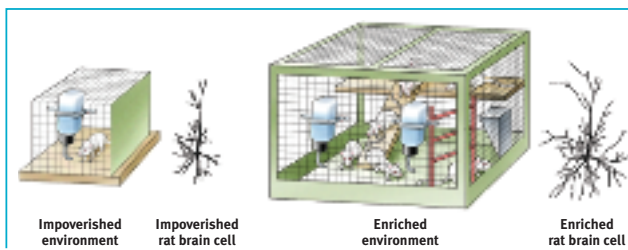


Figure 50.1
Experience affects brain development Mark Rosenzweig, David Krech, and their colleagues raised rats either alone in an environment without playthings, or with other rats in an environment enriched with playthings changed daily. In 14 of 16 repetitions of this basic experiment, rats in the enriched environment developed significantly more cerebral cortex (relative to the rest of the brain's tissue) than did those in the impoverished environment.

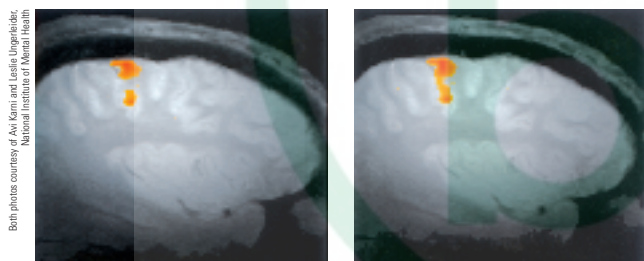
Such results have motivated improvements in environments for laboratory, farm, and zoo animals—and for children in institutions. Stimulation by touch or massage also benefits infant rats and premature babies (Field et al., 2007). “Handled” infants of both species develop faster neurologically and gain weight more rapidly. By giving preemies massage therapy, neonatal intensive care units now help them to go home sooner (Field et al., 2006).

Both nature and nurture sculpt our synapses. After brain maturation provides us with an abundance of neural connections, our experiences trigger a pruning process. Sights and smells, touches and tugs activate and strengthen connections. Unused neural pathways weaken. Like forest pathways, popular tracks are broadened and less-traveled ones gradually disappear. The result by puberty is a massive loss of unemployed connections.

Here at the juncture of nurture and nature is the biological reality of early childhood learning. During early childhood—while excess connections are still on call—youngsters can most easily master such skills as the grammar and accent of another language. Lacking any exposure to language before adolescence, a person will never master any language (see Module 36). Likewise, lacking visual experience during the early years, those whose vision is restored by cataract removal never achieve normal perceptions (see Module 19). The brain cells normally assigned to vision have died or been diverted to other uses. The maturing brain’s rule: Use it or lose it.

Although normal stimulation during the early years is critical, the brain’s development does not end with childhood. As we saw in Module 12’s discussion of brain plasticity, our neural tissue is ever changing and new neurons are born. If a monkey pushes a lever with the same finger several thousand times a day, brain tissue controlling that finger changes to reflect the experience. Human brains work similarly (FIGURE 50.2). Whether learning to keyboard or skateboard, we perform with increasing skill as our brain incorporates the learning (Ambrose, 2010).

“Genes and experiences are just two ways of doing the same thing—wiring synapses.” —JOSEPH LEDOUX, *THE SYNAPTIC SELF*, 2002



Both photos courtesy of Avi Karni and Leslie Ungerleider, National Institute of Mental Health

Figure 50.2
A trained brain A well-learned fingertapping task activates more motor cortex neurons (orange area, right) than were active in the same brain before training (left). (From Karni et al., 1998.)

ENGAGE

Enrichment

For several years, many parents believed that exposing their infants to classical music would increase intelligence later in life. This was known as the Mozart effect, and the practice seemed to be the key to making smart infants. Unfortunately, the Mozart effect was based on one study, and subsequent studies have shown that the effect does not have the impact on intellectual development that proponents claimed it had.

ENGAGE**Enrichment**

Freudian psychologists (most notably, Freud himself) often blamed all manner of mental illness on “bad mothering.” Freud believed that schizophrenia was a result of mothers being too overbearing. Today, we realize that many mental illnesses, including schizophrenia, are biologically based. The mothers and fathers of persons with mental illness no longer need to struggle with guilt regarding their parenting techniques.

ENGAGE**Active Learning**

Have students interview their siblings or friends and their siblings to test how alike or different they are from each other. How many likes and dislikes do the siblings share? What are some striking differences?

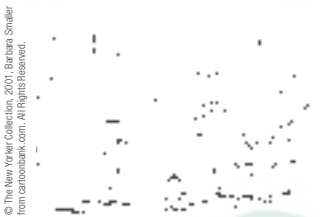
How Much Credit or Blame Do Parents Deserve?**50-2** In what ways do parents and peers shape children’s development?

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“To be frank, officer, my parents never set boundaries.”

FYI

Even among chimpanzees, when one infant is hurt by another, the victim’s mother will often attack the offender’s mother (Goodall, 1968).



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“So I blame you for everything—whose fault is that?”

“If you want to blame your parents for your own adult problems, you are entitled to blame the genes they gave you, but you are not entitled—by any facts I know—to blame the way they treated you. . . . We are not prisoners of our past.” —MARTIN SELIGMAN, *WHAT YOU CAN CHANGE AND WHAT YOU CAN’T*, 1994

In procreation, a woman and a man shuffle their gene decks and deal a life-forming hand to their child-to-be, who is then subjected to countless influences beyond their control. Parents, nonetheless, feel enormous satisfaction in their children’s successes, and feel guilt or shame over their failures. They proudly display their “my child is on the honor roll” bumper sticker. And they wonder where they went wrong with the teenager who is repeatedly suspended from school. Freudian psychiatry and psychology have been among the sources of such ideas, by blaming problems from asthma to schizophrenia on “bad mothering.” Society has reinforced such parent blaming: Believing that parents shape their offspring as a potter molds clay, people readily praise parents for their children’s virtues and blame them for their children’s vices. Popular culture endlessly proclaims the psychological harm toxic parents inflict on their fragile children. No wonder having and raising children can seem so risky.

But do parents really produce future adults with an inner wounded child by being (take your pick from the toxic-parenting lists) overbearing—or uninvolved? Pushy—or ineffectual? Overprotective—or distant? Are children really so easily wounded? If so, should we then blame our parents for our failings, and ourselves for our children’s failings? Or does talk of wounding fragile children through normal parental mistakes trivialize the brutality of real abuse?

Parents do matter. The power of parenting is clearest at the extremes: the abused children who become abusive, the neglected who become neglectful, the loved but firmly handled who become self-confident and socially competent. The power of the family environment also appears in the remarkable academic and vocational successes of children of people who fled from Vietnam and Cambodia—successes attributed to close-knit, supportive, even demanding families (Caplan et al., 1992).

Yet in personality measures, shared environmental influences from the womb onward typically account for less than 10 percent of children’s differences. In the words of behavior geneticists Robert Plomin and Denise Daniels (1987; Plomin, 2011), “Two children in the same family are [apart from their shared genes] as different from one another as are pairs of children selected randomly from the population.” To developmental psychologist Sandra Scarr (1993), this implied that “parents should be given less credit for kids who turn out great and blamed less for kids who don’t.” Knowing children are not easily sculpted by parental nurture, perhaps parents can relax a bit more and love their children for who they are.

Peer Influence

As children mature, what other experiences do the work of nurturing? At all ages, but especially during childhood and adolescence, we seek to fit in with our groups and are influenced by them (Harris, 1998, 2000):

- Preschoolers who disdain a certain food often will eat that food if put at a table with a group of children who like it.
- Children who hear English spoken with one accent at home and another in the neighborhood and at school will invariably adopt the accent of their peers, not their parents. Accents (and slang) reflect culture, “and children get their culture from their peers,” notes Judith Rich Harris (2007).

- Teens who start smoking typically have friends who model smoking, suggest its pleasures, and offer cigarettes (J. S. Rose et al., 1999; R. J. Rose et al., 2003). Part of this peer similarity may result from a *selection effect*, as kids seek out peers with similar attitudes and interests. Those who smoke (or don't) may select as friends those who also smoke (or don't).

"Men resemble the times more than they resemble their fathers."
-ANCIENT ARAB PROVERB

Howard Gardner (1998) has concluded that parents and peers are complementary:

Parents are more important when it comes to education, discipline, responsibility, orderliness, charitableness, and ways of interacting with authority figures. Peers are more important for learning cooperation, for finding the road to popularity, for inventing styles of interaction among people of the same age. Youngsters may find their peers more interesting, but they will look to their parents when contemplating their own futures. Moreover, parents [often] choose the neighborhoods and schools that supply the peers.

This power to select a child's neighborhood and schools gives parents an ability to influence the culture that shapes the child's peer group. And because neighborhood influences matter, parents may want to become involved in intervention programs that aim at a whole school or neighborhood. If the vapors of a toxic climate are seeping into a child's life, that climate—not just the child—needs reforming. Even so, peers are but one medium of cultural influence. As a purported African proverb declares, and former U.S. Secretary of State Hillary Clinton has popularized, "It takes a village to raise a child."



Alan Shomaki/Getty Images

Peer power As we develop, we play, date, and partner with peers. No wonder children and youths are so sensitive and responsive to peer influences.

Before You Move On

► **ASK YOURSELF**

To what extent, and in what ways, have your peers and your parents helped shape who you are?

► **TEST YOURSELF**

To predict whether a teenager smokes, ask how many of the teen's friends smoke. One explanation for this correlation is peer influence. What's another?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

ENGAGE

Enrichment

While peers may influence slang, food, and fashion preferences, parents are more influential when it comes to values, political beliefs, and manners. Thus, parents may not be able to keep their children from getting tattoos or the latest trendy jacket, but children would rather get their parents' advice when picking political candidates.

CLOSE & ASSESS

Exit Assessment

Have students write a short response to what areas of their lives are influenced by parents and what areas are influenced by their friends. Have them discuss this issue in terms of what they learned about in this module.

Module 50 Review

50-1 How do early experiences modify the brain?

- As a child's brain develops, neural connections grow more numerous and complex. Experiences then trigger a pruning process, in which unused connections weaken and heavily used ones strengthen.
- Early childhood is an important period for shaping the brain, but throughout our lives our brain modifies itself in response to our learning.

50-2 In what ways do parents and peers shape children's development?

- Parents influence their children in areas such as manners and political and religious beliefs, but not in other areas, such as personality.
- As children attempt to fit in with their peers, they tend to adopt their culture—styles, accents, slang, attitudes.
- By choosing their children's neighborhoods and schools, parents exert some influence over peer group culture.

Answers to Multiple-Choice Questions

1. d 3. b
2. a 4. e

Answer to Practice FRQ 2 (Sample Answers)

1 point: Preschoolers who disdain a certain food often will eat that food if put at a table with a group of children who like it.

1 point: Children who hear English spoken with one accent at home and another in the neighborhood and at school will invariably adopt the accent of their peers.

Multiple-Choice Questions

1. According to Plomin and Daniels, "Two children in the same family are [apart from their shared genes] as different from _____ as are pairs of children selected randomly from the population."
 - a. their parents
 - b. their grandparents
 - c. their friends
 - d. one another
 - e. their cousins
2. Compared with rats raised in an enriched environment, which of the following is true of rats raised in isolation?
 - a. Their brain cortex is less developed.
 - b. Though neurologically similar, they fear other rats.
 - c. Their brains have more connections.
 - d. They have a thicker brain cortex.
 - e. The differences between the two groups are not statistically significant.
3. What is the *primary* means by which parents influence the behavior of their children?
 - a. Parenting style
 - b. Genetic contributions
 - c. Prenatal environment
 - d. Teaching cooperation
 - e. Rewarding achievement
4. Neurologically, what is the function of pruning?
 - a. Pruning creates new connections between synapses through repeated experiences.
 - b. Pruning reduces the negative effects of teratogens by eliminating neural waste.
 - c. Pruning increases the weight of the brain through enriching experiences.
 - d. Pruning creates areas in the brain used in learning mathematics.
 - e. Pruning eliminates unused neural pathways.

Practice FRQs

1. Compare and contrast the influence parents and peers have on a child's development, giving one example for each.

Answer

2 points: Parents influence a child's (1) quality of life, (2) attachments and beliefs, (3) exposure to peer culture via neighborhood and schools.

2 points: Peers influence a child's (1) tastes and styles, (2) accents and slang, and (3) substance use.

2. Provide two examples of how children seek to fit in with their groups and are influenced by them.

(2 points)

Module 51

Adolescence: Physical and Cognitive Development

Module Learning Objectives

- 51-1** Define *adolescence*, and identify the major physical changes during this period.
- 51-2** Describe adolescent cognitive and moral development, according to Piaget, Kohlberg, and later researchers.

- 51-1** How is *adolescence* defined, and what physical changes mark this period?

Many psychologists once believed that childhood sets our traits. Today's developmental psychologists see development as lifelong. As this *life-span perspective* emerged, psychologists began to look at how maturation and experience shape us not only in infancy and childhood, but also in adolescence and beyond. Your story is still being written. **Adolescence**—the years spent morphing from child to adult—starts with the physical beginnings of sexual maturity and ends with the social achievement of independent adult status. In some cultures, where teens are self-supporting, this means that adolescence hardly exists.

G. Stanley Hall (1904), one of the first psychologists to describe adolescence, believed that the tension between biological maturity and social dependence creates a period of “storm and stress.” Indeed, after age 30, many who grew up in independence-fostering Western cultures look back on their teenage years as a time they would not want to relive, a time when their peers’ social approval was imperative, their sense of direction in life was in flux, and their feeling of alienation from their parents was deepest (Arnett, 1999; Macfarlane, 1964).

But for many, adolescence is a time of vitality without the cares of adulthood, a time of rewarding friendships, heightened idealism, and a growing sense of life's exciting possibilities.

Physical Development

Adolescence begins with *puberty*, the time when we mature sexually. Puberty follows a surge of hormones, which may intensify moods and which trigger a series of bodily changes, described in Module 53.

Just as in the earlier life stages, the *sequence* of physical changes in puberty (for example, breast buds and visible pubic hair before *menarche*—the first menstrual period) is far more predictable than their *timing*. Some girls start their growth spurt at 9, some boys as late as age 16. Though such variations have little effect on height at maturity, they may have psychological consequences: It is not only when we mature that counts, but how people react to our physical development.

ENGAGE

Enrichment

G. Stanley Hall is considered the father of American psychology. He studied under Wilhelm Wundt in Leipzig, Germany, learning the new science of psychology in the first experimental lab to be established. Hall later went on to be president of Clark University in Worcester, MA, where he fostered a thriving psychology department that trained most of the United States' early psychologists, including Lewis Terman, Francis Cecil Sumner, and Margaret Floy

Washburn. He also established the American Psychological Association (APA) in his living room near the Clark campus.



adolescence the transition period from childhood to adulthood, extending from puberty to independence.

Try This

How will you look back on your life 10 years from now? Are you making choices that someday you will recollect with satisfaction?

TEACH

TRM Discussion Starter

Use the Module 51 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

ENGAGE

TRM Enrichment

Adolescence as we know it today did not evolve until the early 20th century when child-labor laws and compulsory education delayed the social onset of adulthood. *Adolescence* is a term coined by G. Stanley Hall (the father of American psychology), who called it “a time of storm and stress.” Use Student Activity: Introducing Adolescent Development from the TRM to introduce the concept of adolescent development.

ENGAGE

Enrichment

Before G. Stanley Hall popularized adolescence in 1904, it was not really necessary in most cultures. J. F. Kett cited 3 distinct time periods that mark the development of adolescence:

- 1790–1840: Children began working to support the family. In 1832, 40% of factory workers in New England were children.
- 1840–1900: Child-labor laws increased the minimum age to work. *Compulsory education* became a way to occupy the time of children who were no longer allowed to work.
- 1900–present: Adolescence has emerged as a distinct developmental stage. Adolescents today also stay in school longer. Some even say that college is a time that merely extends adolescence even more.

Fuhrmann, B. S. (1990). *Adolescence, adolescents*. Glenview, IL: Scott, Foresman/Little Brown.

ENGAGE**Enrichment**

Early maturation has social effects on both boys and girls. For both sexes, maturing early provides them with coordination and physical features that are more adult-like. They may also be treated more like adults by adults because they look and move like adults. For boys, coaches may pay attention and invest energy into early-maturing boys, leading to feelings of self-confidence and popularity among other teens. For girls, looking more adultlike can lead to more attention from adult women, who may mentor them more often.



Erik Isaksson/Jupiterimages

For boys, early maturation has mixed effects. Boys who are stronger and more athletic during their early teen years tend to be more popular, self-assured, and independent, though also more at risk for alcohol use, delinquency, and premature sexual activity (Conley & Rudolph, 2009; Copeland et al., 2010; Lynne et al., 2007).

For girls, early maturation can be a challenge (Mendle et al., 2007). If a young girl's body and hormone-fed feelings are out of sync with her emotional maturity and her friends' physical development and experiences, she may begin associating with older adolescents or may suffer teasing or sexual harassment (Ge & Natsuaki, 2009).

An adolescent's brain is also a work in progress. Until puberty, brain cells increase their connections, like trees growing more roots and branches. Then, during adolescence comes a selective pruning of unused neurons and connections (Blakemore, 2008). What we don't use, we lose.

As teens mature, their frontal lobes also continue to develop. The growth of *myelin*, the fatty tissue that forms around axons and speeds neurotransmission, enables better communication with other brain regions (Kuhn, 2006; Silveri et al., 2006). These developments bring improved judgment, impulse control, and long-term planning.

Maturation of the frontal lobes nevertheless lags behind that of the emotional limbic system. Puberty's hormonal surge and limbic system development help explain teens' occasional impulsiveness, risky behaviors, and emotional storms—slamming doors and turning up the music (Casey et al., 2008). No wonder younger teens (whose unfinished frontal lobes aren't yet fully equipped for making long-term plans and curbing impulses) so often succumb to the tobacco corporations, which most adult smokers could tell them they will later regret. Teens actually don't underestimate the risks of smoking—or fast driving or unprotected sex. They just, when reasoning from their gut, weigh the immediate benefits more heavily (Reyna & Farley, 2006; Steinberg, 2007, 2010). They seek thrills and rewards, but they can't yet locate the brake pedal controlling their impulses.

So, when Junior drives recklessly and academically self-destructs, should his parents reassure themselves that “he can't help it; his frontal cortex isn't yet fully grown”? They can at least take hope: The brain with which Junior begins his teens differs from the brain with which he will end his teens. Unless he slows his brain development with heavy drinking—leaving him prone to impulsivity and addiction—his frontal lobes will continue maturing until about age 25 (Beckman, 2004; Crews et al., 2007).

In 2004, the American Psychological Association joined seven other medical and mental health associations in filing U.S. Supreme Court briefs arguing against the death penalty for 16- and 17-year-olds. The briefs documented the teen brain's immaturity “in areas that bear upon adolescent decision making.” Teens are “less guilty by reason of adolescence,” suggested psychologist Laurence Steinberg and law professor Elizabeth Scott (2003; Steinberg et al., 2009). In 2005, by a 5-to-4 margin, the Court concurred, declaring juvenile death penalties unconstitutional.

Cognitive Development

51-2 How did Piaget, Kohlberg, and later researchers describe adolescent cognitive and moral development?

During the early teen years, reasoning is often self-focused. Adolescents may think their private experiences are unique, something parents just could not understand: “But, Mom, you don't really know how it feels to be in love” (Elkind, 1978). Capable of thinking about



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“Young man, go to your room and stay there until your cerebral cortex matures.”

“If a gun is put in the control of the prefrontal cortex of a hurt and vengeful 15-year-old, and it is pointed at a human target, it will very likely go off.” —NATIONAL INSTITUTES OF HEALTH BRAIN SCIENTIST DANIEL R. WEINBERGER, “A BRAIN TOO YOUNG FOR GOOD JUDGMENT,” 2001

TEACH**Teaching Tip**

Have students look up cases in which juveniles were tried as adults. What were the circumstances of the crime that led to the charge? Why did the prosecutors choose the charges they did?

their own thinking, and about other people's thinking, they also begin imagining what others are thinking about *them*. (They might worry less if they understood their peers' similar self-absorption.) Gradually, though, most begin to reason more abstractly.

Developing Reasoning Power

When adolescents achieve the intellectual summit Jean Piaget called *formal operations*, they apply their new abstract reasoning tools to the world around them. They may think about what is ideally possible and compare that with the imperfect reality of their society, their parents, and even themselves. They may debate human nature, good and evil, truth and justice. Their sense of what's fair changes from simple equality to equity—to what's proportional to merit (Almás et al., 2010). Having left behind the concrete images of early childhood, they may now seek a deeper conception of God and existence (Elkind, 1970; Worthington, 1989). Reasoning hypothetically and deducing consequences also enables adolescents to detect inconsistencies and spot hypocrisy in others' reasoning. This can lead to heated debates with parents and silent vows never to lose sight of their own ideals (Peterson et al., 1986).



"When the pilot told us to brace and grab our ankles, the first thing that went through my mind was that we must all look pretty stupid." ~JEREMIAH RAWLINGS, AGE 12, AFTER A 1989 DC-10 CRASH IN SIOUX CITY, IOWA

Demonstrating their reasoning ability

Although they supported different candidates in the 2012 U.S. presidential election, these teens were all demonstrating their ability to think logically about abstract topics. According to Piaget, they were in the final cognitive stage, formal operations.

Developing Morality

Two crucial tasks of childhood and adolescence are discerning right from wrong and developing character—the psychological muscles for controlling impulses. To be a moral person is to *think* morally and *act* accordingly. Jean Piaget and Lawrence Kohlberg proposed that moral reasoning guides moral actions. A newer view builds on psychology's game-changing new recognition that much of our functioning occurs not on the "high road" of deliberate, conscious thinking but on the "low road" of unconscious, automatic thinking.

MORAL REASONING

Piaget (1932) believed that children's moral judgments build on their cognitive development. Agreeing with Piaget, Lawrence Kohlberg (1981, 1984) sought to describe the development of *moral reasoning*, the thinking that occurs as we consider right and wrong. Kohlberg posed moral dilemmas (for example, whether a person should steal medicine to save a loved one's life) and asked children, adolescents, and adults whether the action was right or wrong. He then analyzed their answers for evidence of stages of moral thinking. His findings led him to propose three basic levels of moral thinking: preconventional, conventional, and postconventional (**TABLE 51.1** on the next page).



Moral reasoning Some Staten Island, New York, residents faced a moral dilemma in 2012 when Superstorm Sandy caused disastrous flooding. Should they risk their lives to try to rescue family, friends, and neighbors in dangerously flooded areas?

ENGAGE

Enrichment

Adolescents experience egocentrism, but in a different way from children. With adolescent egocentrism, teens experience the *imaginary audience phenomenon* in which they believe others are always paying attention to them, especially their flaws. Also, they feel that no one else has experienced life exactly as they have, referred to as the "*nobody understands me*" phenomenon.

TEACH

Teaching Tip

Because teens often grapple with what is moral, pose the following questions to help them focus on their definitions of morality.

- What does it mean to be a moral person?
- What stage of morality (based on Kohlberg) would you say you and your friends are in most of the time?
- Does the definition of morality change according to the situation, or does it remain the same all the time?

TEACH

Flip It

Students can get additional help understanding moral development in adolescence by watching the Flip It Video: Adolescent Moral Development.

TEACH**TRM** Common Pitfalls

Kohlberg used the term *conventional* in his theory to describe the most prevalent type of morality he found in society. He used the term *preconventional* morality for people before they joined society as “adults.” Kohlberg believed that a type of *postconventional* morality existed, but he was unable to find enough people to study over a long period of time to validate it. Use Student Activity: Explaining Morality Using Kohlberg from the TRM to extend the discussion of Kohlberg’s moral development.

ENGAGE

Enrichment

Kohlberg didn’t believe that people could skip stages of moral development. He, like Piaget, believed that each stage built on the one before it, so skipping stages was not likely. His theory would fit into a “continuity versus stages” argument in favor of a stage theory of development.

ENGAGE

Applying Science

Conduct some active research with your students by having them present moral dilemmas to their classmates. Participants should write out a paragraph explaining how they would respond to the dilemmas. Analyze the results to determine the level of moral development into which each participant seems to fit. Be sure to keep the following in mind:

- Have students obtain informed consent.
- Code the paragraphs to ensure anonymity of the participants.
- Create a rubric for analyzing the paragraphs. What words or phrases will indicate each level of moral development?

AP® Exam Tip

Kohlberg’s is an important stage theory. There are often AP® exam questions on this topic. It’s very important to understand that the stage you’re in doesn’t depend on *what* you decide to do (for example, steal the medicine), it depends on *why* you decide to do it.

Table 51.1 Kohlberg’s Levels of Moral Thinking

Level (approximate age)	Focus	Example
<i>Preconventional morality</i> (before age 9)	Self-interest; obey rules to avoid punishment or gain concrete rewards.	“If you save your wife, you’ll be a hero.”
<i>Conventional morality</i> (early adolescence)	Uphold laws and rules to gain social approval or maintain social order.	“If you steal the drug, everyone will think you’re a criminal.”
<i>Postconventional morality</i> (adolescence and beyond)	Actions reflect belief in basic rights and self-defined ethical principles.	“People have a right to live.”

Kohlberg claimed these levels form a moral ladder. As with all stage theories, the sequence is unvarying. We begin on the bottom rung and ascend to varying heights. Kohlberg’s critics have noted that his postconventional stage is culturally limited, appearing mostly among people who prize individualism (Eckensberger, 1994; Miller & Bersoff, 1995).

Moral Intuition

Psychologist Jonathan Haidt (2002, 2006, 2010) believes that much of our morality is rooted in *moral intuitions*—“quick gut feelings, or affectively laden intuitions.” According to this intuitionist view, the mind makes moral judgments as it makes aesthetic judgments—quickly and automatically. We *feel* disgust when seeing people engaged in degrading or subhuman acts. Even a disgusting taste in the mouth heightens people’s disgust over various moral digressions (Eskine et al., 2011). We *feel* elevation—a tingly, warm, glowing feeling in the chest—when seeing people display exceptional generosity, compassion, or courage. These feelings in turn trigger moral reasoning, says Haidt.

One woman recalled driving through her snowy neighborhood with three young men as they passed “an elderly woman with a shovel in her driveway. I did not think much of it, when one of the guys in the back asked the driver to let him off there. . . . When I saw him jump out of the back seat and approach the lady, my mouth dropped in shock as I realized that he was offering to shovel her walk for her.” Witnessing this unexpected goodness triggered elevation: “I felt like jumping out of the car and hugging this guy. I felt like singing and running, or skipping and laughing. I felt like saying nice things about people” (Haidt, 2000).

“Could human morality really be run by the moral emotions,” Haidt wonders, “while moral reasoning struts about pretending to be in control?” Consider the desire to punish. Laboratory games reveal that the desire to punish wrongdoings is mostly driven not by reason (such as an objective calculation that punishment deters crime) but rather by emotional reactions, such as moral outrage (Darley, 2009). After the emotional fact, moral reasoning—our mind’s press secretary—aims to convince us and others of the logic of what we have intuitively felt.

This intuitionist perspective on morality finds support in a study of moral paradoxes. Imagine seeing a runaway trolley headed for five people. All will certainly be killed unless you throw a switch that diverts the trolley onto another track, where it will kill one person. Should you throw the switch? Most say *Yes*. Kill one, save five.

Now imagine the same dilemma, except that your opportunity to save the five requires you to push a large stranger onto the tracks, where he will die as his body stops the trolley. Kill one, save five? The logic is the same, but most say *No*. Seeking to understand why, a Princeton research team led by Joshua Greene (2001) used brain imaging to spy on people’s neural responses as they contemplated such dilemmas. Only when given the body-pushing type of moral dilemma did their brain’s emotion areas activate. Despite the identical logic, the personal dilemma engaged emotions that altered moral judgment.

- Have several students analyze each paragraph and compare their evaluations to ensure reliability.
- Designate students to write up the research in a way that resembles a scholarly paper. Consider submitting your findings to a student journal.

While the new moral psychology illustrates the many ways moral intuitions trump moral reasoning, others reaffirm the importance of moral reasoning. The religious and moral reasoning of the Amish, for example, shapes their practices of forgiveness, communal life, and modesty (Narvaez, 2010). Joshua Greene (2010) likens our moral cognition to a camera. Usually, we rely on the automatic point-and-shoot. But sometimes we use reason to manually override the camera's automatic impulse.

MORAL ACTION

Our moral thinking and feeling surely affect our moral talk. But sometimes talk is cheap and emotions are fleeting. Morality involves *doing* the right thing, and what we do also depends on social influences. As political theorist Hannah Arendt (1963) observed, many Nazi concentration camp guards during World War II were ordinary “moral” people who were corrupted by a powerfully evil situation.

Today's character education programs tend to focus on the whole moral package—thinking, feeling, and *doing* the right thing. As children's *thinking* matures, their *behavior* also becomes less selfish and more caring (Krebs & Van Hesteren, 1994; Miller et al., 1996). Today's programs also teach children *empathy* for others' feelings, and the self-discipline needed to restrain one's own impulses—to delay small gratifications now to enable bigger rewards later. Those who do learn to *delay gratification* become more socially responsible, academically successful, and productive (Funder & Block, 1989; Mischel et al., 1988, 1989). In service-learning programs, teens tutor, clean up their neighborhoods, and assist the elderly. The result? The teens' sense of competence and desire to serve increase, and their school absenteeism and drop-out rates diminish (Andersen, 1998; Piliavin, 2003). Moral action feeds moral attitudes.

“It is a delightful harmony when doing and saying go together.”
—MICHEL EYQUEM DE MONTAIGNE
(1533–1592)



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“This might not be ethical. Is that a problem for anybody?”

Before You Move On

▶ ASK YOURSELF

Can you recall making an impulsive decision when you were younger that you later regretted? Would you approach the situation differently today?

▶ TEST YOURSELF

Describe Kohlberg's three levels of moral reasoning.

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 51 Review

51-1 How is *adolescence* defined, and what physical changes mark this period?

- *Adolescence* is the transition period from childhood to adulthood, extending from puberty to social independence.
- For boys, early maturation has mixed effects; for girls, early maturation can be a challenge.
- The brain's frontal lobes mature and myelin growth increases during adolescence and the early twenties, enabling improved judgment, impulse control, and long-term planning.

51-2 How did Piaget, Kohlberg, and later researchers describe adolescent cognitive and moral development?

- Piaget theorized that adolescents develop a capacity for formal operations and that this development is the foundation for moral judgment.
- Lawrence Kohlberg proposed a stage theory of moral reasoning, from a preconventional morality of self-interest, to a conventional morality concerned with upholding laws and social rules, to (in some people) a postconventional morality of universal ethical principles.

ENGAGE

Active Learning

Have students break into groups and study youth-led activism, including such movements as the protests against the Vietnam War and the French Revolution.

- How have youth influenced these movements?
- What impact have youth had on other revolutionary movements, such as the American Revolution and the Civil War?
- How do current activist groups effectively use the energy and enthusiasm of youth to forward their agendas?
- How does government seek to involve youth in its workings?

CLOSE & ASSESS

Exit Assessment

Have students discuss the following questions: Is adolescence a time of storm and stress? In what ways? How can parents and teachers help students experience less storm and stress?

Answers to Multiple-Choice Questions

1. d 4. c 6. d
2. a 5. c 7. d
3. c

Answer to Practice FRQ 2

2 points: Sexual maturity: menarche, spermarche, primary and secondary sex characteristics

1 point: Neurological development, specifically frontal lobe development related to decision making and impulsivity

- Other researchers believe that morality lies in moral intuition and moral action as well as thinking.

- Some critics argue that Kohlberg's postconventional level represents morality from the perspective of individualist cultures.

Multiple-Choice Questions

- The growth of _____ around axons speeds neurotransmission, enabling better communication between the frontal lobe and other brain regions.
 - neurons
 - the cell body
 - dendrites
 - myelin
 - synapses
- The maturation of the brain's _____ lags behind the development of the limbic system, which may explain the impulsivity of teenagers compared with adults.
 - frontal lobes
 - temporal lobes
 - occipital lobes
 - parietal lobes
 - corpus colosum
- _____ believed that a child's moral judgments build on cognitive development. _____ agreed and sought to describe the development of moral reasoning.
 - Kohlberg; Erikson
 - Erikson; Kohlberg
 - Piaget; Kohlberg
 - Piaget; Erikson
 - Haidt; Hall
- Which level of moral reasoning includes a focus on upholding laws in order to gain social approval?
 - Collectivist
 - Preconventional
 - Conventional
 - Postconventional
 - Formal operational
- What development in adolescents allows for greater impulse control?
 - The hormonal surge of early adolescence
 - Hindbrain changes associated with the onset of puberty
 - Frontal lobe maturation in late adolescence
 - Limbic system development in mid-adolescence
 - A decrease in myelin production throughout adolescence
- Which of Jean Piaget's stages describes typical adolescent thinking?
 - Sensorimotor
 - Preoperational
 - Concrete operational
 - Formal operational
 - Accommodation
- Which of the following correctly describes one of Kohlberg's levels of moral reasoning?
 - Preconventional stage, where one follows moral principles
 - Conventional stage, where individualism is foremost
 - Conventional stage, where it is imperative to uphold the law and follow rules
 - Preconventional stage, where moral judgment depends on rewards and punishments
 - Postconventional stage, where it is imperative to uphold the law and follow rules

Practice FRQs

- Describe how the ideas of Lawrence Kohlberg and Jonathan Haidt differ in regard to the development of morality.

Answer

1 point: Lawrence Kohlberg focused on moral reasoning and the way people *think* about moral situations.

1 point: Jonathan Haidt focused on moral intuition and the way people *feel* about moral situations.

- Name two biological changes related to sexual maturity in adolescence and briefly describe one change in neurological development in adolescence.

(3 points)

Module 52

Adolescence: Social Development and Emerging Adulthood

Module Learning Objectives

- 52-1** Describe the social tasks and challenges of adolescence.
- 52-2** Contrast parental and peer influences during adolescence.
- 52-3** Discuss the characteristics of emerging adulthood.



52-1 What are the social tasks and challenges of adolescence?

Theorist Erik Erikson (1963) contended that each stage of life has its own *psychosocial* task, a crisis that needs resolution. Young children wrestle with issues of *trust*, then *autonomy* (independence), then *initiative*. School-age children strive for *competence*, feeling able and productive. But for people your age, the task is to synthesize past, present, and future possibilities into a clearer sense of self (TABLE 52.1 on the next page). Adolescents wonder, “Who am I as an individual? What do I want to do with my life? What values should I live by? What do I believe in?” Erikson called this quest the adolescent’s *search for identity*.

As sometimes happens in psychology, Erikson’s interests were bred by his own life experience. As the son of a Jewish mother and a Danish Gentile father, Erikson was “doubly an outsider,” reported Morton Hunt (1993, p. 391). He was “scorned as a Jew in school but mocked as a Gentile in the synagogue because of his blond hair and blue eyes.” Such episodes fueled his interest in the adolescent struggle for identity.

Forming an Identity

To refine their sense of identity, adolescents in individualist cultures usually try out different “selves” in different situations. They may act out one self at home, another with friends, and still another at school or on Facebook. If two situations overlap—as when a teenager brings friends home—the discomfort can be considerable. The teen asks, “Which self should I be? Which is the real me?” The resolution is a self-definition that unifies the various selves into a consistent and comfortable sense of who one is—an **identity**.

For both adolescents and adults, group identities are often formed by how we differ from those around us. When living in Britain, I become conscious of my Americanness. When spending time with my daughter in Africa, I become conscious of my minority (White) race. When surrounded by women, I am mindful of my gender identity. For international students, for those of a minority ethnic group, for people with a disability, for those on a team, a **social identity** often forms around their distinctiveness.

“Somewhere between the ages of 10 and 13 (depending on how hormone-enhanced their beef was), children entered adolescence, a.k.a. ‘the de-cutening.’” —JON STEWART ET AL., *EARTH (THE BOOK)*, 2010

AP® Exam Tip

This is not the only place in the book that the author discusses Erik Erikson’s stage theory. For example, trust was discussed on page 492. Integrity comes up on page 548. Table 52.1 pulls it all together in one place for you.

identity our sense of self; according to Erikson, the adolescent’s task is to solidify a sense of self by testing and integrating various roles.

social identity the “we” aspect of our self-concept; the part of our answer to “Who am I?” that comes from our group memberships.

TEACH

TRM Discussion Starter

Use the Module 52 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH

Teaching Tip

Have your students write down 10 different answers to the question, “Who am I?” listing only those things that, if lost, would make a real difference in their sense of identity (e.g., their roles or responsibilities, groups they belong to, beliefs, personality traits, needs, feelings, or behavior patterns). When they have finished, ask them to imagine what life would be like if the items they listed were no longer true (e.g., what would the loss of a parent mean to those who wrote down “son” or “daughter”?). After the students have reviewed items in this way, ask them to order their lists in terms of importance. Have students discuss how their responses connect to their own identity formation.

Bugen, L. A. (1979). *Death and dying: Theory, research, practice*. Dubuque, IA: Wm. C. Brown.

TEACH

Teaching Tip

In outlining Erikson’s theory in class, you might ask students to include in their notes for each stage the name of a person they know who exemplifies the stage. The theory is likely to become less abstract and more meaningful as they check the stages against the reality of living examples.

TEACH**Teaching Tip**

Erikson saw the importance of adolescent identity seeking when he worked with the Oglala Lakota Indians. In their culture, young males would go off on their own to have an identity-determining dream that would guide the courses of their lives. When the U.S. government tried to assimilate the Lakota into American society, the tribe lost this rite of passage, and consequently the young males of the culture were denied this method of finding an identity. Explore rites of passage with your students.

- What rites of passage do American youth go through to achieve adulthood?
- Do these rites help form a sense of identity? Why or why not?
- How does losing a rite of passage hurt a culture?

ENGAGE**Active Learning**

Create a “forming-identity” chart with 4 columns, labeling them with the following 4 subheadings that depict characteristics of adolescence: experimentation, rebellion, “self”-ishness, and optimism. Under each heading, have students brainstorm about situations in which adolescents demonstrate *healthy* experimentation, rebellion, “self”-ishness, and optimism. Although students may snicker about the unhealthy ways to demonstrate these identity-seeking arenas, encourage them to think critically about ways adolescents can achieve an identity without causing harm to themselves or others.

TEACH**Flip It**

Students can get additional help understanding identity development in adolescence by watching the Flip It Video: Adolescent Identity Development.



Competence vs. inferiority



Intimacy vs. isolation

“Self-consciousness, the recognition of a creature by itself as a ‘self,’ [cannot] exist except in contrast with an ‘other,’ a something which is not the self.”
—C. S. LEWIS, *THE PROBLEM OF PAIN*, 1940

Table 52.1 Erikson's Stages of Psychosocial Development

Stage (approximate age)	Issue	Description of Task
Infancy (to 1 year)	Trust vs. mistrust	If needs are dependably met, infants develop a sense of basic trust.
Toddlerhood (1 to 3 years)	Autonomy vs. shame and doubt	Toddlers learn to exercise their will and do things for themselves, or they doubt their abilities.
Preschool (3 to 6 years)	Initiative vs. guilt	Preschoolers learn to initiate tasks and carry out plans, or they feel guilty about their efforts to be independent.
Elementary school (6 years to puberty)	Competence vs. inferiority	Children learn the pleasure of applying themselves to tasks, or they feel inferior.
Adolescence (teen years into 20s)	Identity vs. role confusion	Teenagers work at refining a sense of self by testing roles and then integrating them to form a single identity, or they become confused about who they are.
Young adulthood (20s to early 40s)	Intimacy vs. isolation	Young adults struggle to form close relationships and to gain the capacity for intimate love, or they feel socially isolated.
Middle adulthood (40s to 60s)	Generativity vs. stagnation	In middle age, people discover a sense of contributing to the world, usually through family and work, or they may feel a lack of purpose.
Late adulthood (late 60s and up)	Integrity vs. despair	Reflecting on his or her life, an older adult may feel a sense of satisfaction or failure.

But not always. Erikson noticed that some adolescents forge their identity early, simply by adopting their parents' values and expectations. (Traditional, less individualist cultures teach adolescents who they are, rather than encouraging them to decide on their own.) Other adolescents may adopt an identity defined in opposition to parents but in conformity with a particular peer group—jocks, preps, geeks, band kids, debaters.

Most young people do develop a sense of contentment with their lives. When American teens were asked whether a series of statements described them, 81 percent said *Yes* to “I would choose my life the way it is right now.” The other 19 percent agreed that “I wish I were somebody else” (Lyons, 2004). Reflecting on their existence, 75 percent of American collegians say they “discuss religion/spirituality” with friends, “pray,” and agree that “we are all spiritual beings” and “search for meaning/purpose in life” (Astin et al., 2004; Bryant & Astin, 2008). This would not surprise Stanford psychologist William Damon and his colleagues (2003), who have contended that a key task of adolescence is to achieve a purpose—a desire to accomplish something personally meaningful that makes a difference to the world beyond oneself.

The late teen years, when many people like you in industrialized countries begin attending college or working full time, provide new opportunities for trying out possible roles. Here is something for you to remember: Many college seniors have achieved a clearer identity and a more positive self-concept than they had as first-year students (Waterman, 1988).



Who shall I be today? By varying the way they look, adolescents try out different “selves.” Although we eventually form a consistent and stable sense of identity, the self we present may change with the situation.

This could be one of the reasons why the first year of college is such a challenge. Collegians who have achieved a clear sense of identity are less prone to self-destructive behavior such as alcohol misuse (Bishop et al., 2005).

Several nationwide studies indicate that young Americans’ self-esteem falls during the early to midteen years, and, for girls, depression scores often increase. But then self-image rebounds during the late teens and twenties (Robins et al., 2002; Twenge & Campbell, 2001; Twenge & Nolen-Hoeksema, 2002). Late adolescence and early adulthood are also when agreeableness and emotional stability scores increase (Klimstra et al., 2009; Lucas and Donnellan, 2011).

Erikson contended that the adolescent identity stage is followed in young adulthood by a developing capacity for **intimacy**, the ability to form emotionally close relationships. Romantic relationships, which tend to be emotionally intense, are reported by some two in three North American 17-year-olds, but fewer among those in collectivist countries such as China (Collins et al., 2009; Li et al., 2010). Those who enjoy high-quality (intimate, supportive) relationships with family and friends tend also to enjoy similarly high-quality romantic relationships in adolescence, which set the stage for healthy adult relationships. Such relationships are, for most of us, a source of great pleasure. When Mihaly Csikszentmihalyi [chick-SENT-me-hi] and Jeremy Hunter (2003) used a beeper to sample the daily experiences of American teens, they found them unhappiest when alone and happiest when with friends. As Aristotle long ago recognized, we humans are “the social animal.” Relationships matter.

intimacy in Erikson’s theory, the ability to form close, loving relationships; a primary developmental task in late adolescence and early adulthood.

AP® Exam Tip

Careful! In the media, to describe a relationship as intimate usually implies that it is sexual. Erikson means something different. In his theory, an intimate relationship may or may not be sexual (and a sexual relationship may or may not be intimate).

Parent and Peer Relationships

52-2 How do parents and peers influence adolescents?

This next research finding will not surprise you: As adolescents in Western cultures seek to form their own identities, they begin to pull away from their parents (Shanahan et al., 2007). The preschooler who can’t be close enough to her mother, who loves to touch and cling to her, becomes the 14-year-old who wouldn’t be caught dead holding hands with Mom. The transition occurs gradually. By adolescence, arguments occur more often, usually over mundane things—household chores, bedtime, homework (Tesser et al., 1989). Parent-child conflict during the transition to adolescence tends to be greater with first-born than with second-born children, and greater with mothers than with fathers (Burk et al., 2009; Shanahan et al., 2007).



“She says she’s someone from your past who gave birth to you, and raised you, and sacrificed everything so you could have whatever you wanted.”

TEACH

TRM Teaching Tip

Studies show that adolescent students usually choose values and moral beliefs their parents taught them, rather than those their friends may employ. Pose the following dilemma:

- You and your friends find a sheet of paper that your teacher probably lost. On the paper are the questions and answers for a test that you are going to have tomorrow. Your friends all plan to study from this sheet, and they want you to go along with them. You don’t think you should, but they tell you to do it anyway. What would you

really do: Study from the sheet or not study from it?

Use Student Activity: A Generation Gap? from the TRM to help students explore differences and similarities with their parents.

ENGAGE

Enrichment

Girls describe their friendships as more intimate than do boys. Although some researchers have suggested that this is merely a matter of style, others suggest that male friendships are less intimate because boys trust their friends less than girls do. The sex difference does not simply reflect a developmental delay for boys; adult women also tend to have more intimate friends than do men.

ENGAGE

TRM Enrichment

James Marcia expanded on Erikson’s theory of identity formation. He established 4 distinct ways in which adolescents can express identity formation:

- Identity achievement**, in which adolescents arrive at a sense of identity on their own after considering their options.
- Identity diffusion**, in which adolescents lack commitment to any goal.
- Moratorium**, in which adolescents are still in a crisis period searching for an identity but not yet coming to a conclusion.
- Foreclosure**, in which adolescents make a commitment to an identity without experiencing a crisis. Usually, the adolescent will make an identity decision based on the expectations of others rather than his or her own choices.

Use Student Activity: The Objective Measure of Ego Identity Status (OM-EIS) from the TRM to help students identify their own quest for identity.

ENGAGE**Active Learning**

Divide students into groups to think about their plans for after high school graduation. Present the following questions as discussion starting points.

- Where do you see yourself 1 year from now? 5 years? 10 years? 20 years?
- What is your attitude about going to college? Why do you feel you have this attitude?
- What are your career/work plans?
- Do you feel your plans for the next few years are solid, or do you hope your purpose in life will reveal itself soon?

TEACH**Teaching Tip**

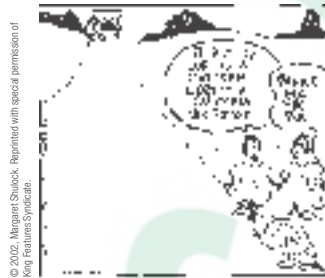
More and more young adults are returning home after college to live with parents and postponing marriage in order to focus on career opportunities. Discuss the following questions with your students related to this phenomenon:

- Why would a young adult return home after college to live with parents? Would you?
- Why is marriage being postponed? Is career advancement the only reason? Why or why not?
- Are adolescents today able to formulate identities so they can avoid “baggage” later in life? Why or why not?

“I love u guys.” —EMILY KEYES’
FINAL TEXT MESSAGE TO HER PARENTS
BEFORE DYING IN A COLORADO SCHOOL
SHOOTING, 2006



© The New Yorker Collection, 2010, Barbara Smaller from cartoonbank.com. All Rights Reserved.
“It’s you who don’t understand me—I’ve been fifteen, but you have never been forty-eight.”



© 2002, Margaret Shulock. Reprinted with special permission of King Features Syndicate.
Nine times out of ten, it’s all about peer pressure.

For a minority of parents and their adolescents, differences lead to real splits and great stress (Steinberg & Morris, 2001). But most disagreements are at the level of harmless bickering. And most adolescents—6000 of them in 10 countries, from Australia to Bangladesh to Turkey—said they like their parents (Offer et al., 1988). “We usually get along but . . .,” adolescents often reported (Galambos, 1992; Steinberg, 1987).

Positive parent-teen relations and positive peer relations often go hand in hand. High school girls who have the most affectionate relationships with their mothers tend also to enjoy the most intimate friendships with girlfriends (Gold & Yanof, 1985). And teens who feel close to their parents tend to be healthy and happy and to do well in school (Resnick et al., 1997). Of course, we can state this correlation the other way: Misbehaving teens are more likely to have tense relationships with parents and other adults.

Adolescence is typically a time of diminishing parental influence and growing peer influence. Asked in a survey if they had “ever had a serious talk” with their child about illegal drugs, 85 percent of American parents answered Yes. But if the parents had indeed given this earnest advice, many teens had apparently tuned it out: Only 45 percent could recall such a talk (Morin & Brossard, 1997).

Heredity does much of the heavy lifting in forming individual temperament and personality differences, and peer influences do much of the rest. Most teens are herd animals. They talk, dress, and act more like their peers than their parents. What their friends are, they often become, and what “everybody’s doing,” they often do. In teen calls to hotline counseling services, peer relationships have been the most discussed topic (Boehm et al., 1999). The average U.S. teen sends 60 text messages per day (Pew, 2012). Many adolescents become absorbed by social networking, sometimes with a compulsive use that produces “Facebook fatigue.”

Online communication stimulates intimate self-disclosure—both for better (support groups) and for worse (online predators and extremist groups) (Subrahmanyam & Greenfield, 2008; Valkenburg & Peter, 2009).

For those who feel excluded, the pain is acute. “The social atmosphere in most high schools is poisonously clique-driven and exclusionary,” observed social psychologist Elliot Aronson (2001). Most excluded “students suffer in silence. . . . A small number act out in violent ways against their classmates.” Those who withdraw are vulnerable to loneliness, low self-esteem, and depression (Steinberg & Morris, 2001). Peer approval matters.

Teens see their parents as having more influence in other areas—for example, in shaping their religious faith and in thinking about college and career choices (*Emerging Trends*, 1997). A Gallup Youth Survey reveals that most share their parents’ political views (Lyons, 2005).

Emerging Adulthood**52-3** What is emerging adulthood?

In the Western world, adolescence now roughly corresponds to the teen years. At earlier times, and in other parts of the world today, this slice of life has been much smaller (Baumeister & Tice, 1986). Shortly after sexual maturity, young people would assume adult responsibilities and status. The event might be celebrated with an elaborate initiation—a public *rite of passage*. The new adult would then work, marry, and have children.

When schooling became compulsory in many Western countries, independence was put on hold until after graduation. From Europe to Australia, adolescents are now taking more time to establish themselves as adults. In the United States, for example, the average age at first marriage has increased more than 4 years since 1960 (to 28 for men, 26 for women). In 1960, 3 in 4 women and 2 in 3 men had, by age 30, finished school, left home, become financially independent, married, and had a child. Today, fewer than half of 30-year-old women and one-third of men have achieved these five milestones (Henig, 2010). Delayed independence has overlapped with an earlier onset of puberty. Earlier sexual maturity is related both to girls' increased body fat (which can support pregnancy and nursing) and to weakened parent-child bonds, including absent fathers (Ellis, 2004).

Together, later independence and earlier sexual maturity have widened the once-brief interlude between biological maturity and social independence (**FIGURE 52.1**). In prosperous communities, the time from 18 to the mid-twenties is an increasingly not-yet-settled phase of life, which some now call **emerging adulthood** (Arnett, 2006, 2007; Reitzle, 2006). No longer adolescents, these emerging adults, having not yet assumed full adult responsibilities and independence, feel "in between." After high school, those who enter the job market or go to college may be managing their own time and priorities more than ever before. Yet they may be doing so from their parents' home—unable to afford their own place and perhaps still emotionally dependent as well. Recognizing today's more gradually emerging adulthood, the U.S. government now allows dependent children up to age 26 to remain on their parents' health insurance (Cohen, 2010).



"When I was your age, I was an adult."

emerging adulthood for some people in modern cultures, a period from the late teens to mid-twenties, bridging the gap between adolescent dependence and full independence and responsible adulthood.

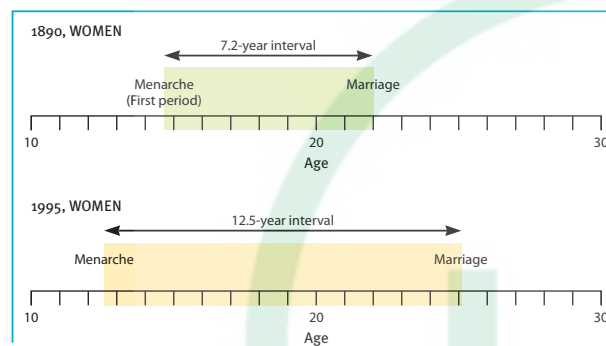


Figure 52.1
The transition to adulthood is being stretched from both ends. In the 1890s, the average interval between a woman's first menstrual period and marriage, which typically marked a transition to adulthood, was about 7 years; in industrialized countries today it is about 12 years (Guttmacher, 1994, 2000). Although many adults are unmarried, later marriage combines with prolonged education and earlier menarche to help stretch out the transition to adulthood.

Before You Move On

▶ ASK YOURSELF

What have been your best and worst experiences during adolescence? How have your experiences been influenced by environmental factors, such as your cultural context, and how have they been influenced by your inborn traits?

▶ TEST YOURSELF

How has the transition from childhood to adulthood changed in Western cultures in the last century or so?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

ENGAGE

TRM Active Learning

Has the modern conception of the stages of adulthood changed in the last century? Brainstorm with students what factors may have led people in U.S. society to reevaluate their conception of adulthood.

- What effect does better health care have on the definitions of adulthood?
- People born after 1960 receive full Social Security benefits only when they reach 67 years of age. Why did the federal government choose this age? Why not younger or older?

Use Student Activity: Interviewing About Adolescence from the TRM to help students explore differences in adolescence from one generation to the next.

ENGAGE

Critical Questions

Students may be curious about why physical maturity is occurring earlier in modern youth. Consider the following questions when looking at Figure 52.1.

- What factors have contributed to earlier physical development in teens? (*Increased body fat and stress hormones.*)
- What impact has early sexual development had on society?
- Are there cultures where sexual maturity happens later than in the United States? Earlier? Why are those cultures different?

TEACH

Teaching Tip

Survey your students regarding whether they have made concrete plans for life after high school. Depending on the time in the school year, most have probably not chosen a college or decided what type of work they will do after high school. Maybe seeing that others around them are just as undecided about the immediate future will help them relax about the stressful life choices they will be making in the next few months and years.

CLOSE & ASSESS**Exit Assessment**

Have students discuss the implications of early physical maturation on cognitive and social development. What are the pros and cons of early development?

Answers to Multiple-Choice Questions

1. b 3. a
2. c 4. d

Module 52 Review**52-1** What are the social tasks and challenges of adolescence?

- Erikson theorized that each life stage has its own psychosocial task, and that a chief task of adolescence is solidifying one's sense of self—one's *identity*. This often means "trying on" a number of different roles.
- *Social identity* is the part of the self-concept that comes from a person's group memberships.

52-2 How do parents and peers influence adolescents?

- During adolescence, parental influence diminishes and peer influence increases.
- Adolescents adopt their peers' ways of dressing, acting, and communicating.
- Parents have more influence in religion, politics, and college and career choices.

52-3 What is emerging adulthood?

- The transition from adolescence to adulthood is now taking longer.
- *Emerging adulthood* is the period from age 18 to the mid-twenties, when many young people are not yet fully independent. But critics note that this stage is found mostly in today's Western cultures.

Multiple-Choice Questions

- According to Erikson, you develop your _____, a part of who you are, from your group memberships.
 - self-interest
 - social identity
 - social self
 - self-esteem
 - self-consciousness
- In many Western societies, it is common for adolescents to graduate high school, go to college, and still live at home with their parents. They have not yet assumed full adult responsibilities and independence. Psychologists have identified this period of time as
 - adulthood.
 - early adulthood.
 - emerging adulthood.
 - late adolescence.
 - role confusion.
- Which is true of social relations during the teen years?
 - As teens distance themselves from parents, peer relationships become more important.
 - High school girls who have the poorest relationships with their mothers have the most intense friendships with peers.
 - Parental influence peaks during mid to late adolescence.
 - Most adolescents have serious disagreements with parents, leading to great social stress.
 - Teens are generally more concerned with family relationships than peer relationships.
- According to Erikson, what is the primary developmental task for adolescents?
 - Trust versus mistrust
 - Initiative versus guilt
 - Competence versus inferiority
 - Identity versus role confusion
 - Intimacy versus isolation

5. Compared with the late nineteenth century, what is true about the transition from childhood to adulthood in Western cultures?
- It starts earlier and is completed earlier.
 - It starts later and is completed later.
 - It starts later and is completed earlier.
 - It starts earlier and is completed later.
 - It has not changed.
6. Megan, a third grader, is having trouble with math. She is starting to do poorly in other subjects, because she feels she cannot master math. Based on Erikson's stages of psychosocial development, which stage is Megan in?
- Autonomy versus shame and doubt
 - Initiative versus guilt
 - Competence versus inferiority
 - Identity versus role confusion
 - Intimacy versus isolation
7. Boez is a 2-year-old boy who is in the process of potty training. When Boez urinates in the potty, he has a sense of pride. If Boez urinates in his pants, he runs and hides. According to Erikson, in which psychosocial stage is Boez?
- Autonomy versus shame and doubt
 - Initiative versus guilt
 - Competence versus inferiority
 - Identity versus role confusion
 - Intimacy versus isolation

Practice FRQs

1. What is emerging adulthood? Name two trends that have led to adding this to the stages of life.
2. Name and describe Erik Erikson's stages of psychosocial development for infancy (first year) and middle adulthood (40s to 60s).

Answer

1 point: Emerging adulthood is the period in modern Western cultures during the late teens to the mid-twenties that bridges the gap between adolescent dependence and adult independence.

2 points: Longer years of schooling and later age of marriage and moving out of the family home are the trends that have led to this new stage.

(4 points)

5. d 7. a
6. c

Answer to Practice FRQ 2

1 point: **Infancy: trust versus mistrust**

1 point: **During the first year, infants are torn between trusting and mistrusting their parents. If their needs are met, infants will develop trust in the predictability of their environment. Otherwise, frustrated infants become fearful and concerned about security.**

1 point: **Middle adulthood: generativity versus stagnation**

1 point: **In middle adulthood, adults try to remain productive and creative. People who have successfully negotiated the earlier 6 stages are likely to find meaning and joy in all aspects of their lives. For others, life becomes dull and tedious.**

TEACH**TRM Discussion Starter**

Use the Module 53 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

TEACH**Teaching Tip**

Sex-linked traits are those that are passed down to the child by the mother through the X chromosome. Typically, these traits are recessive, so when the father passes along another X chromosome (thus resulting in a female), his chromosome dominates the recessive gene. Therefore, most sex-linked traits are exhibited in males because they only have one X chromosome. Color blindness is an example of this type of trait.

TEACH**Concept Connections**

Use this content as a review of the biological concepts discussed in Unit III. Help students remember the parts of the brain that are responsible for various behaviors.

TEACH**Teaching Tip**

Students may be surprised to read that women secrete testosterone. In fact, men and women secrete both sex hormones, but men secrete more testosterone than women, and women secrete more estrogens than men. However, as Myers points out, testosterone plays a role for both men and women in their levels of sexual desire.

Module 53

Sexual Development

Module Learning Objectives

- 53-1** Explain how biological sex is determined, and describe the role of sex hormones in gender development.
- 53-2** Describe some of the ways that sexual development varies.
- 53-3** Discuss the factors that reduce the risk of sexually transmitted infections.
- 53-4** Discuss the factors that influence teenagers' sexual behaviors and use of contraceptives.
- 53-5** Summarize what research has taught us about sexual orientation.



Image Source/Getty Images

53-1 How is our biological sex determined, and how do sex hormones influence prenatal and adolescent development?

In domains where we face similar challenges—regulating heat with sweat, preferring foods that nourish, growing calluses where the skin meets friction—men and women are similar. Even when describing the ideal mate, both prize traits such as “kind,” “honest,” and “intelligent.” But in mating-related domains, evolutionary psychologists contend, males differ from females whether they are elephants or elephant seals, rural peasants or corporate presidents (Geary, 2010). Our biology may influence our gender differences in two ways: genetically, by our differing *sex chromosomes*, and physiologically, from our differing concentrations of *sex hormones*.

Prenatal Sexual Development

As noted earlier, males and females are variations on a single form—of the 46 chromosomes, 45 are unisex. So great is this similarity that until seven weeks after conception, you were anatomically indistinguishable from someone of the other sex. Then your genes activated your biological sex. Male or female, your sex was determined by your father's contribution to your twenty-third pair of chromosomes, the two sex chromosomes. You received an **X chromosome** from your mother. From your father, you received the one chromosome that is not unisex—either another X chromosome, making you a girl, or a **Y chromosome**, making you a boy.

The Y chromosome includes a single gene which, about seven weeks after conception, throws a master switch triggering the testes to develop and to produce the principal male hormone, **testosterone**. This hormone starts the development of male sex organs. Females also have testosterone, but less of it.

X chromosome the sex chromosome found in both men and women. Females have two X chromosomes; males have one. An X chromosome from each parent produces a female child.

Y chromosome the sex chromosome found only in males. When paired with an X chromosome from the mother, it produces a male child.

testosterone the most important of the male sex hormones. Both males and females have it, but the additional testosterone in males stimulates the growth of the male sex organs in the fetus and the development of the male sex characteristics during puberty.

Another key period for sexual differentiation falls during the fourth and fifth prenatal months. During this period, sex hormones bathe the fetal brain and influence its wiring. Different patterns for males and females develop under the influence of the male's greater testosterone and the female's ovarian hormones (Hines, 2004; Udry, 2000).

Adolescent Sexual Development

Pronounced physical differences emerge during adolescence, when boys and girls enter **puberty** and mature sexually. A surge of hormones triggers a two-year period of rapid physical development, usually beginning at about age 11 in girls and at about age 13 in boys. A year or two before that, however, boys and girls often feel the first stirrings of physical attraction (McClintock & Herdt, 1996).

About the time of puberty, boys' growth propels them to greater height than their female counterparts (**FIGURE 53.1**). During this growth spurt, the **primary sex characteristics**—the reproductive organs and external genitalia—develop dramatically. So do **secondary sex characteristics**, the nonreproductive traits such as breasts and hips in girls, facial hair and deepened voice in boys, and pubic and underarm hair in both sexes (**FIGURE 53.2** on the next page).

In various countries, girls are developing breasts earlier (sometimes before age 10) and reaching puberty earlier than in the past. This phenomenon is variously attributed to increased body fat, increased hormone-mimicking chemicals, and increased stress related to family disruption (Biro et al., 2010).

Puberty's landmarks are the first ejaculation in boys (*spermarche*), usually by about age 14, and the first menstrual period in girls (**menarche**—meh-NAR-key), usually within a year of age 12½ (Anderson et al., 2003). Menarche appears to occur a few months earlier, on average, for girls who have experienced stresses related to father absence, sexual abuse, or insecure attachments (Belsky et al., 2010; Vigil et al., 2005; Zabin et al., 2005). Girls who have



Nick Downes.

puberty the period of sexual maturation, during which a person becomes capable of reproducing.

primary sex characteristics the body structures (ovaries, testes, and external genitalia) that make sexual reproduction possible.

secondary sex characteristics nonreproductive sexual traits, such as female breasts and hips, male voice quality, and body hair.

menarche [meh-NAR-key] the first menstrual period.

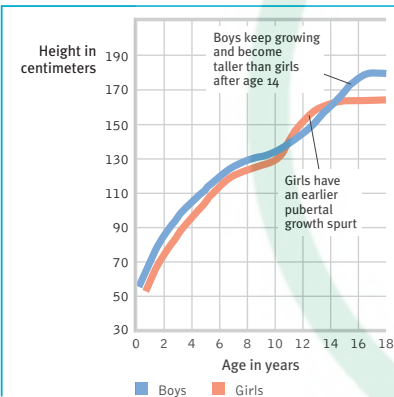


Figure 53.1

Height differences Throughout childhood, boys and girls are similar in height. At puberty, girls surge ahead briefly, but then boys overtake them at about age 14. (Data from Tanner, 1978.) Studies suggest that sexual development and growth spurts are beginning somewhat earlier than was the case a half-century ago (Herman-Giddens et al., 2001).



Rob Levine/Getty Images

TEACH

TRM Common Pitfalls

Because puberty may be an uncomfortable topic of discussion for some teens, be sensitive to this discomfort while still encouraging your students to talk about their feelings. You might enlist the help of a teacher of the opposite sex to help lead discussions about issues affecting both males and females. In this way, all students can feel comfortable talking about this sensitive time. Use Student Activity: Writing About Puberty from the TRM to help students decrease their discomfort when discussing puberty.

ENGAGE

Active Learning

Have students get into small groups to research laws and policies concerning sex education in your state. Initiate a discussion with the class about these programs and how they differ in various communities.

- Do the policies differ from one school system to another?
- Why were policies adopted in certain communities?
- What does psychological research say about the effectiveness of different types of sex education programs?
- Now that a vaccine is available for the virus that causes pelvic inflammatory disease (PID; the virus that leads to cervical cancer), several states are debating whether to make the vaccine mandatory for all teenage girls. Should states mandate this vaccine like they mandate the measles vaccine for children? Why or why not?

ENGAGE**Enrichment**

The onset of puberty has changed for both boys and girls in the last 100 years. About 100 years ago, girls used to mature sexually around 15 years of age. However, girls sexually mature today at around 12 years of age. Along with this backwards trend, the average age of marriage has increased from 22 (100 years ago) to about 25 (today). If today's teens are going to abstain from sex until marriage, they must wait over 12 years between the onset of puberty until marriage.

TEACH**Common Pitfalls**

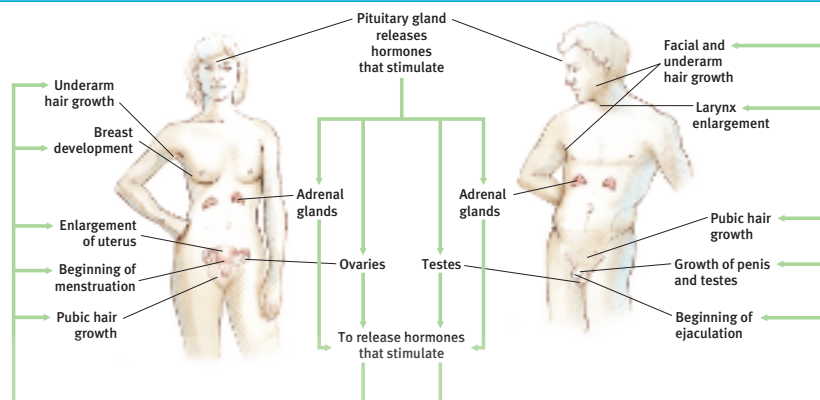
Your students may ask you about the term *hermaphrodite* when talking about intersex individuals. Help your students use the more appropriate terminology, *intersex*, for people with this type of physical appearance.

TEACH**Teaching Tip**

Consult with a surgeon who specializes in sex-reassignment surgery for infants. Why do the surgeons so often choose to provide female anatomy for intersex individuals? How does research into the effects of gender assignment surgery influence the decisions surrounding such surgery?

Figure 53.2

Body changes at puberty At about age 11 in girls and age 13 in boys, a surge of hormones triggers a variety of physical changes.



been prepared for menarche usually experience it as a positive life transition. Studies have shown that nearly all adult women recall their first menstrual period and remember experiencing a mixture of feelings—pride, excitement, embarrassment, and apprehension (Greif & Ulman, 1982; Woods et al., 1983). Most men have similarly recalled their first ejaculation, which usually occurs as a nocturnal emission (Fuller & Downs, 1990).

Variations on Sexual Development**53-2** What are some of the ways that sexual development varies?

Sometimes nature blurs the biological line between males and females. Atypical hormone exposure or sensitivity may cause atypical fetal development. *Intersex* individuals are born with intermediate or unusual combinations of male and female physical features. Genetic males, for example, may be born with normal male hormones and testes but without a penis or with a very small one.

Until recently, pediatricians and other medical experts often recommended surgery to create a female identity for these children. One study reviewed 14 cases of boys who had undergone early sex-reassignment surgery and had been raised as girls. Of those cases, 6 had later declared themselves as males, 5 were living as females, and 3 had an unclear gender identity (Reiner & Gearhart, 2004).

Although not born with an intersex condition, a little boy who lost his penis during a botched circumcision became a famous case illustrating the problems involved in sex-reassignment surgery. His parents followed a psychiatrist's advice to raise him as a girl rather than as a damaged boy. Alas, "Brenda" Reimer was not like most other girls. "She" didn't like dolls. She tore her dresses with rough-and-tumble play. At puberty she wanted no part of kissing boys. Finally, Brenda's parents explained what had happened, whereupon "Brenda" immediately rejected the assigned female identity. He cut his hair and chose a male name, David. He eventually married a woman and became a stepfather. And, sadly, he later committed suicide (Colapinto, 2000).

The bottom line: "Sex matters," concluded the National Academy of Sciences (2001). In combination with the environment, sex-related genes and physiology "result in behavioral and cognitive differences between males and females." Nature and nurture work together.

Gender in the spotlight Dramatic improvements in South African track star Caster Semenya's race times prompted the International Association of Athletics Federations to undertake sex testing in 2009. Semenya was reported to be intersex—with physical characteristics of both males and females—though she was officially cleared to continue competing as a woman. Semenya declared, "God made me the way I am and I accept myself. I am who I am" (YOU, 10 September 2009).



Sexually Transmitted Infections

53-3 How can sexually transmitted infections be prevented?

Rates of *sexually transmitted infections* (STIs; also called STDs for *sexually transmitted diseases*) are rising, and two-thirds of the new infections have occurred in people under 25 (CASA, 2004). Teenage girls, because of their not yet fully mature biological development and lower levels of protective antibodies, are especially vulnerable (Dehne & Riedner, 2005; Guttmacher, 1994). A Centers for Disease Control study of sexually experienced 14- to 19-year-old U.S. females found 39.5 percent had STIs (Forhan et al., 2008).

Consider this: If someone uses a birth control method that is 98 percent effective in preventing pregnancy or infection, a 2 percent chance of failure in the first such use accumulates to a risk of nearly 50 percent after 30 such uses. Moreover, when people feel drawn to a partner, they become motivated to underestimate risks (Knäuper et al., 2005).

Condoms offer only limited protection against certain skin-to-skin STIs, such as herpes, but they do reduce other risks (Medical Institute, 1994; NIH, 2001). The effects were clear when Thailand promoted 100 percent condom use by commercial sex workers. Over a 4-year period, as condom use soared from 14 to 94 percent, the annual number of bacterial STIs plummeted from 410,406 to 27,362 (WHO, 2000).

Across the available studies, condoms also have been 80 percent effective in preventing transmission of *HIV* (*human immunodeficiency virus*—the virus that causes **AIDS**) from an infected partner (Weller & Davis-Beatty, 2002; WHO, 2003). Although AIDS can be transmitted by other means, such as needle sharing during drug use, its sexual transmission is most common. Women's AIDS rates are increasing fastest, partly because the virus is passed from man to woman much more often than from woman to man. A man's semen can carry more of the virus than can a woman's vaginal and cervical secretions. The HIV-infected semen can also linger for days in a woman's vagina and cervix, increasing the time of exposure (Allen & Setlow, 1991; WHO, 2004).

Most people recently diagnosed with AIDS in the United States have been ages 25 to 44 (CDC, 2013a). Given AIDS' long incubation period, it's unsurprising that 39 percent of new HIV diagnoses in the United States were among those even younger—13- to 29-year-olds (CDC, 2013b). In 2009, the death of 1.8 million people with AIDS worldwide left behind countless grief-stricken partners and millions of orphaned children (UNAIDS, 2010). Sub-Saharan Africa is home to two-thirds of those infected with HIV, and medical treatment and care for the dying are sapping the region's social resources.

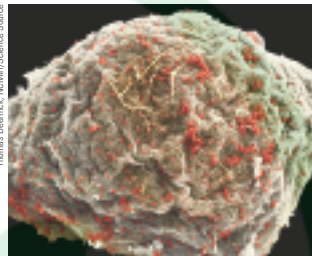
Many people assume that oral sex falls in the category of "safe sex," but recent studies show a significant link between oral sex and transmission of STIs, such as the *human papilloma virus* (HPV). Risks rise with the number of sexual partners (Gillison et al., 2012). Most HPV infections can now be prevented with a vaccination administered before sexual contact.

Teen Pregnancy

53-4 What factors influence teenagers' sexual behaviors and use of contraceptives?

Adolescents' physical maturation fosters a sexual dimension to their emerging identity. Yet sexual expression varies dramatically with time and culture. Among American women born before 1900, a mere 3 percent had experienced premarital sex by age 18 (Smith, 1998). A century later, about half of U.S. ninth- to twelfth-graders reported having had sexual intercourse (CDC, 2010). Teen intercourse rates are roughly similar in Western Europe and in Latin America, but much lower in Arab and Asian countries and among North Americans of Asian descent (McLaughlin et al., 1997; Wellings et al., 2006). Given the wide variation across time and place, it's no surprise that twin research has found that environmental factors accounted

AIDS (acquired immune deficiency syndrome) a life-threatening, sexually transmitted infection caused by the *human immunodeficiency virus* (HIV). AIDS depletes the immune system, leaving the person vulnerable to infections.



An HIV-infected cell

ENGAGE

Active Learning

Sexually transmitted infections are a problem in the United States. Many students are unaware of the pervasiveness of STIs and the dangers associated with them. Have students do research on any of the following STIs:

- chlamydia
- syphilis
- HIV/AIDS
- gonorrhea
- pelvic inflammatory disease (PID) and cervical cancer
- herpes

Students should address the following questions about the disease:

- What are the symptoms of the disease?
- How many people are infected each year?
- What is the prognosis for this disease? Are there any treatments/cures available?

ENGAGE**Active Learning**

Teen pregnancy is a controversial issue in many parts of the country. Have students explore the following questions related to this issue:

- What are the health risks of having a baby in the teen years?
- What policies does your school have about pregnant teens? How do other students in school view pregnant students?
- Should teen couples who are pregnant get married? Why or why not?

ENGAGE**Enrichment**

Overall, the research showing what qualities lead to sexual restraint all relate to one overarching idea: engagement. Students who are engaged in school (learning), their religion, their families, and in prosocial projects seem to buffer themselves against early sexual experiences.

"All of us who make motion pictures are teachers, teachers with very loud voices." -FILM PRODUCER GEORGE LUCAS, ACADEMY AWARD CEREMONIES, 1992

for almost three-fourths of the individual variation in age of sexual initiation (Bricker et al., 2006). Family and cultural values matter.

Compared with European teens, American teens have a higher rate of STIs and also of teen pregnancy (Call et al., 2002; Sullivan/Anderson, 2009). What environmental factors contribute to teen pregnancy?

Minimal communication about birth control Many teenagers are uncomfortable discussing contraception with their parents, partners, and peers. Teens who talk freely with parents, and who are in an exclusive relationship with a partner with whom they communicate openly, are more likely to use contraceptives (Aspy et al., 2007; Milan & Kilmann, 1987).

Guilt related to sexual activity In another survey, 72 percent of sexually active 12- to 17-year-old American girls said they regretted having had sex (Reuters, 2000). Sexual inhibitions or ambivalence can restrain sexual activity, but if passion overwhelms intentions they may also reduce attempts at birth control (Gerrard & Luus, 1995; MacDonald & Hynie, 2008).

Alcohol use Sexually active teens are typically alcohol-using teens (Zimmer-Gembeck & Helfand, 2008), and those who use alcohol prior to sex are less likely to use condoms (Kotchick et al., 2001). By depressing the brain centers that control judgment, inhibition, and self-awareness, alcohol disarms normal restraints, a phenomenon well known to sexually coercive males.

Mass media norms of unprotected promiscuity Media help write the "social scripts" that affect our perceptions and actions. So what sexual scripts do today's media write on our minds? An average hour of prime-time television on the three major U.S. networks has contained 15 sexual acts, words, and innuendos. The partners were usually unmarried, with no prior romantic relationship, and few communicated any concern for birth control or STIs (Brown et al., 2002; Kunkel, 2001; Sapolsky & Tabarlet, 1991). The more sexual content adolescents view (even when controlling for other predictors of early sexual activity), the more likely they are to perceive their peers as sexually active, to develop sexually permissive attitudes, and to experience early intercourse (Escobar-Chaves et al., 2005; Martino et al., 2005; Ward & Friedman, 2006). (See Close-up: The Sexualization of Girls.)

Recently, there has been a greater emphasis on teen abstinence within some comprehensive sex-education programs. A government-commissioned study of four urban, school-based abstinence programs found that 49 percent of students not participating had sex over the next four to six years. And how many participating in the abstinence programs did so? An identical 49 percent (Trenholm et al., 2007). A National Longitudinal Study of Adolescent Health followed abstinence pledgers and nonpledgers (matched samples of similarly conservative teens who had never had sex). Five years later, the pledgers—82 percent of whom denied having ever pledged—were just as likely to have had premarital sex (Rosenbaum, 2009). However, a more recent experiment offered African-American middle school students an abstinence education program rooted in social psychological theory and research. In the ensuing two years, only 34 percent of those who participated started having sex, compared with 49 percent of those randomly assigned to a health promotion control group (Jemmott et al., 2010).

The National Longitudinal Study of Adolescent Health among 12,000 teens found several factors that predicted sexual restraint:

- **High intelligence** Teens with high rather than average intelligence test scores more often delayed sex, partly because they appreciated possible negative consequences and were more focused on future achievement than on here-and-now pleasures (Halpern et al., 2000).
- **Religious engagement** Actively religious teens have more often reserved sexual activity for adulthood (Lucero et al., 2008).

Close-up**The Sexualization of Girls**

As you have surely noticed, TV, the Internet, music videos and lyrics, movies, magazines, sports media, and advertising often portray women and even girls as sexual objects. The frequent result, according to both an American Psychological Association task force (2007) and the Scottish Parliament (2010), is harm to their self-image, and unhealthy sexual development.

Sexualization occurs when girls

- are led to value themselves in terms of their sexual appeal.
- compare themselves to narrowly defined beauty standards.
- see themselves as sexual beings for others' use.



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PictureGroup via AP IMAGES

In experiments, the APA task force reported, being made self-conscious about one's body, such as by wearing a swimsuit, disrupts thinking when doing math computations or logical reasoning. Sexualization also contributes to eating disorders and depression, and to unrealistic expectations regarding sexuality.

Mindful of today's sexualizing media, the APA has some suggestions for countering these messages. Parents, teachers, and others can teach girls "to value themselves for who they are rather than how they look." They can teach boys "to value girls as friends, sisters, and girlfriends, rather than as sexual objects." And they can help girls and boys develop "media literacy skills" that enable them to recognize and resist the message that women are sexual objects and that a thin, sexy look is all that matters.

- **Father presence** In studies that followed hundreds of New Zealand and U.S. girls from age 5 to 18, a father's absence was linked to sexual activity before age 16 and to teen pregnancy (Ellis et al., 2003). These associations held even after adjusting for other adverse influences, such as poverty. Close family attachments—families that eat together and where parents know their teens' activities and friends—also predicted later sexual initiation (Coley et al., 2008).
- **Participation in service learning programs** Several experiments have found that teens volunteering as tutors or teachers' aides, or participating in community projects, had lower pregnancy rates than were found among comparable teens randomly assigned to control conditions (Kirby, 2002; O'Donnell et al., 2002). Researchers are unsure why. Does service learning promote a sense of personal competence, control, and responsibility? Does it encourage more future-oriented thinking? Or does it simply reduce opportunities for unprotected sex?



Eidos Scripps Howard Photo Service/Newscom

Keeping abreast of hypersexuality

An analysis of the 60 top-selling video games found 489 characters, 86 percent of whom were males (like most of the game players). The female characters were much more likely than the male characters to be "hypersexualized"—partially nude or revealingly clothed, with large breasts and tiny waists (Downs & Smith, 2010).

Sexual Orientation**53-5** What has research taught us about sexual orientation?

We express the *direction* of our sexual interest in our **sexual orientation**—our enduring sexual attraction toward members of our own sex (*homosexual orientation*), the other sex (*heterosexual orientation*), or both sexes (*bisexual orientation*). As far as we know, all cultures in all times have been predominantly heterosexual (Bullough, 1990). Some cultures have condemned same-sex relations. (In Kenya and Nigeria, 98 percent have thought homosexuality is "never justified" [Pew, 2006].) Others have accepted same-sex marriage, which by 2013 had become legal in 14 countries. But in both cases, heterosexuality prevails and homosexuality endures.

sexual orientation an enduring sexual attraction toward members of either one's own sex (homosexual orientation), the other sex (heterosexual orientation), or both sexes (bisexual orientation).

ENGAGE**Enrichment**

As recently as the 1970s, the American Psychiatric Association classified homosexuality as a mental illness in its *Diagnostic and Statistical Manual of Mental Disorders* (or *DSM*). Today, psychiatrists and psychologists alike do not view homosexuality as a mental disorder.

ENGAGE**Enrichment**

The 2013 *Lara Croft, Tomb Raider Definitive Edition* video game has reimagined the main character. Instead of showing her as she is pictured here, highly sexualized and unrealistically dressed for an archeologist/adventurer, she is now dressed in longer khaki pants and is more physically in proportion. The video game developers have indicated that the changes were in response to criticism over Croft's highly sexualized characterization.

TEACH**Common Pitfalls**

Some of your students may be dealing with issues concerning sexuality, both heterosexual and homosexual. Discussions of homosexuality may be sensitive. Be aware of your community's understanding of the research concerning this issue. Determine how you can promote informed tolerance for individual people who may be dealing with questions in this area.

TEACH**Teaching Tip**

You may want to use the following terms that more accurately define the different types of orientations.

- *Lesbian* refers to homosexual women.
- *Gay* refers to homosexual men.
- *Bisexual* refers to men and women who prefer sex with both men and women.
- *Questioning* refers to those who are questioning their sexual orientation, but have not yet decided whether they are homosexual, heterosexual, or bisexual.

TEACH**Common Pitfalls**

Regardless of your community's religious beliefs, the findings presented in this section of the unit are based on scientific methodology. Help your students be critical thinkers about this issue.

FYI

In one British survey, of the 18,876 people contacted, 1 percent were seemingly asexual, having "never felt sexually attracted to anyone at all" (Bogaert, 2004, 2006b).



Driven to suicide In 2010, Rutgers University student Tyler Clementi jumped off this bridge after his intimate encounter with another man reportedly became known. Reports then surfaced of other gay teens who had reacted in a similarly tragic fashion after being taunted. Since 2010, Americans—especially those under 30—have been increasingly supportive of those with same-sex orientations.

FYI

Note that the scientific question is not "What causes homosexuality?" (or "What causes heterosexuality?") but "What causes differing sexual orientations?" In pursuit of answers, psychological science compares the backgrounds and physiology of people whose sexual orientations differ.

How many people are exclusively homosexual? About 10 percent, as the popular press has often assumed? Nearly 25 percent, as average Americans estimated in a 2011 Gallup survey (Morales, 2011)? Not according to more than a dozen national surveys that have explored sexual orientation in Europe and the United States, using methods protecting the respondents' anonymity. The most accurate figure seems to be about 3 percent of men and 1 or 2 percent of women, or perhaps a tad more if allowing for some underreporting (Chandra et al., 2011; Gates & Newport, 2012; Herbenick et al., 2010a,b). Fewer than 1 percent of survey respondents—for example, only 12 people out of 7076 Dutch adults in one survey (Sandfort et al., 2001)—have reported being actively bisexual. A larger number of adults—13 percent of women and 5 percent of men in a U.S. National Center for Health Statistics survey—report some same-sex sexual contact during their lives (Chandra et al., 2011). And still more have had an occasional homosexual fantasy.

What does it feel like to be the "odd man (or woman) out" in a heterosexual culture? If you are heterosexual, one way to understand is to imagine how you would feel if you were socially isolated for openly admitting or displaying your feelings toward someone of the other sex. How would you react if you overheard people making crude jokes about heterosexual people, or if most movies, TV shows, and advertisements portrayed (or implied) homosexuality? And how would you answer if your family members were pleading with you to change your heterosexual lifestyle and to enter into a homosexual marriage?

Facing such reactions, homosexual people often struggle with their sexual orientation. They may at first try to ignore or deny their desires, hoping they will go away. But they don't. The feelings typically persist, as do those of heterosexual people—who are similarly incapable of becoming homosexual (Haldeman, 1994, 2002; Myers & Scanzoni, 2005).

Most of today's psychologists therefore view sexual orientation as neither willfully chosen nor willfully changed. "Efforts to change sexual orientation are unlikely to be successful and involve some risk of harm," declared a 2009 American Psychological Association report. In 1973, the American Psychiatric Association dropped homosexuality from its list of "mental illnesses." In 1993, the World Health Organization did the same, as did Japan's and China's psychiatric associations in 1995 and 2001. Some have noted that rates of depression and attempted suicide are higher among gays and lesbians. Many psychologists believe, however, that these symptoms may result from experiences with bullying, harassment, and discrimination (Sandfort et al., 2001; Warner et al., 2004). "Homosexuality, in and of itself, is not associated with mental disorders or emotional or social problems," declared the American Psychological Association (2007).

Thus, sexual orientation in some ways is like handedness: Most people are one way, some the other. A very few are ambidextrous. Regardless, the way one is endures.

This conclusion is most strongly established for men. Compared with men's sexual orientation, women's tends to be less strongly felt and may be more variable (Chivers, 2005; Diamond, 2008; Peplau & Garnets, 2000). Men's lesser *erotic plasticity* (sexual variability) is apparent in many ways (Baumeister, 2000). Adult women's sexual drive and interests are more flexible and varying than are adult men's. Women, more than men, for example, prefer to alternate periods of high sexual activity with periods of almost none. They are also more likely than men to feel and act on bisexual attractions (Mosher et al., 2005).

Environment and Sexual Orientation

So, our sexual orientation is something we do not choose and (especially for males) seemingly cannot change. Where then, do these preferences come from? Let's look first at possible environmental influences on sexual orientation. To see if you can anticipate the conclusions that have emerged from hundreds of studies, try answering *Yes* or *No* to these questions:

1. Is homosexuality linked with problems in a child's relationships with parents, such as with a domineering mother and an ineffectual father, or a possessive mother and a hostile father?

- Does homosexuality involve a fear or hatred of people of the other sex, leading individuals to direct their desires toward members of their own sex?
- Is sexual orientation linked with levels of sex hormones currently in the blood?
- As children, were most homosexuals molested, seduced, or otherwise sexually victimized by an adult homosexual?

The answer to all these questions has been *No* (Storms, 1983). In a search for possible environmental influences on sexual orientation, Kinsey Institute investigators interviewed nearly 1000 homosexuals and 500 heterosexuals. They assessed nearly every imaginable psychological cause of homosexuality—parental relationships, childhood sexual experiences, peer relationships, and dating experiences (Bell et al., 1981; Hammersmith, 1982). Their findings: Homosexuals were no more likely than heterosexuals to have been smothered by maternal love or neglected by their father. And consider this: If “distant fathers” were more likely to produce homosexual sons, then shouldn’t boys growing up in father-absent homes more often be gay? (They are not.) And shouldn’t the rising number of such homes have led to a noticeable increase in the gay population? (It has not.) Most children raised by gay or lesbian parents grow up straight and well-adjusted (Gartrell & Bos, 2010).

A bottom line has emerged from a half-century’s theory and research: If there are environmental factors that influence sexual orientation, we do not yet know what they are.

Biology and Sexual Orientation

The lack of evidence for environmental causes of homosexuality has motivated researchers to explore possible biological influences. They have considered

- evidence of homosexuality in other species,
- gay-straight brain differences,
- genetics, and
- prenatal hormones.

SAME-SEX ATTRACTION IN OTHER SPECIES

In Boston’s Public Gardens, caretakers have solved the mystery of why a much-loved swan couple’s eggs never hatch. Both swans are female. In New York City’s Central Park Zoo, penguins Silo and Roy spent several years as devoted same-sex partners. At least occasional same-sex relations have been observed in several hundred species (Bagemihl, 1999). Grizzlies, gorillas, monkeys, flamingos, and owls are all on the long list. Among rams, for example, some 7 to 10 percent (to sheep-breeding ranchers, the “duds”) display same-sex attraction by shunning ewes and seeking to mount other males (Perkins & Fitzgerald, 1997). Some degree of homosexual behavior seems a natural part of the animal world.

GAY-STRAIGHT BRAIN DIFFERENCES

Researcher Simon LeVay (1991) studied sections of the hypothalamus (a brain structure linked to emotion) taken from deceased heterosexual and homosexual people. As a gay man, LeVay wanted to do “something connected with my gay identity.” To avoid biasing the results, he did a *blind study*, without knowing which donors were gay or straight. After 9 months of peering through his microscope at a hypothalamus cell cluster that seemed to come in different sizes, he consulted the donor records. The cell cluster was reliably larger in heterosexual men than in women and homosexual men. “I was almost in a state of shock,” LeVay said (1994). “I took a walk by myself on the cliffs over the ocean. I sat for half an hour just thinking what this might mean.”



Stephen J. Cannery/AP Photo

Personal values affect sexual orientation less than they affect other forms of sexual behavior Compared with people who rarely attend religious services, for example, those who attend regularly are one-third as likely to have lived together before marriage, and they report having had many fewer sex partners. But (if male) they are just as likely to be homosexual (Smith, 1998).

Juliet and Juliet Boston’s beloved swan couple, “Romeo and Juliet,” were discovered actually to be, as are many other animal partners, a same-sex pair.



Boston Globe via Getty Images

TEACH

Concept Connections

Many studies about homosexual orientation are correlational. Remind students that correlation does not mean causation. The causes of homosexuality are not known, but these findings do point to potential variables that may influence homosexuality.

TEACH

Teaching Tip

The studies of brain differences in men and women, gay or straight, are not experimental, so their conclusions are limited. These results may be due to a variety of factors, one of which is the sexual orientation of the donor. The brain science of sexual orientation is very young. Students should consider the types of studies needed to come to solid conclusions about the biology of sexual orientation.

TEACH**Common Pitfalls**

Regardless of how students may view sexual orientation, there is no excuse for negative prejudice or discrimination against people they might feel are different sexually. All students deserve to be treated tolerantly. Help students to be intolerant of intolerance.

It should not surprise us that brains differ with sexual orientation. Remember, *everything psychological is simultaneously biological*. But when did the brain difference begin? At conception? During childhood or adolescence? Did experience produce the difference? Or was it genes or prenatal hormones (or genes via prenatal hormones)?

LeVay does not view this cell cluster as an “on-off button” for sexual orientation. Rather, he believes it is an important part of a brain pathway that is active during sexual behavior. He agrees that sexual behavior patterns could influence the brain’s anatomy. (Neural pathways in our brain do grow stronger with use.) In fish, birds, rats, and humans, brain structures vary with experience—including sexual experience (Breedlove, 1997). But LeVay believes it more likely that brain anatomy influences sexual orientation. His hunch seems confirmed by the discovery of a similar difference found between the 7 to 10 percent of male sheep that display same-sex attraction and the 90+ percent attracted to females (Larkin et al., 2002; Roselli et al., 2002, 2004). Moreover, such differences seem to develop soon after birth, perhaps even before birth (Rahman & Wilson, 2003).

Since LeVay’s discovery, other researchers have reported additional gay-straight brain activity differences. One is an area of the hypothalamus that governs sexual arousal (Savic et al., 2005). When straight women were given a whiff of a scent derived from men’s sweat (which contains traces of male hormones), this area became active. Gay men’s brains responded similarly to the men’s scent. Straight men’s brains did not. They showed the arousal response only to a female hormone sample. In a similar study, lesbians’ responses differed from those of straight women (Kranz & Ishai, 2006; Martins et al., 2005).

GENETIC INFLUENCES

Three lines of evidence suggest a genetic influence on sexual orientation.

FAMILY STUDIES Researchers have speculated about possible reasons why “gay genes” might persist in the human gene pool, given that same-sex couples cannot naturally reproduce. One possible answer is kin selection. Recall from Module 15 the evolutionary psychology reminder that many of our genes also reside in our biological relatives. Perhaps, then, gay people’s genes live on through their supporting the survival and reproductive success of their nieces, nephews, and other relatives (who also carry many of the same genes). Gay men make generous uncles, suggests one study of Samoans (Vasey & VanderLaan, 2010).

An alternative “fertile females” theory suggests that maternal genetics may also be at work (Bocklandt et al., 2006). Homosexual men tend to have more homosexual relatives on their mother’s side than on their father’s (Camperio-Ciani et al., 2004, 2009; Zietsch et al., 2008). And the relatives on the mother’s side also produce more offspring than do the maternal relatives of heterosexual men. Perhaps the genes that dispose women to be strongly attracted to men, and therefore to have more children, also dispose some men to be attracted to men (LeVay, 2011).

TWIN STUDIES Twin studies indicate that genes influence sexual orientation. Identical twins (who have identical genes) are somewhat more likely than fraternal twins (whose genes are not identical) to share a homosexual orientation (Alanko et al., 2010; Långström et al., 2008, 2010). However, because sexual orientation differs in many identical twin pairs (especially female twins), other factors must also play a role.

FRUIT FLY STUDIES Laboratory experiments on fruit flies have altered a single gene and changed the flies’ sexual orientation and behavior (Dickson, 2005). During courtship, females acted like males (pursuing other females) and males acted like females (Demir & Dickson, 2005). With humans, it’s likely that multiple genes, possibly in interaction with other influences, shape sexual orientation. In search of such genetic markers, one study financed by the U.S. National Institutes of Health is analyzing the genes of more than 1000 gay brothers.

PRENATAL INFLUENCES

Twins share not only genes, but also a prenatal environment. Two sets of findings indicate that prenatal environment matters.

First, in humans, a critical period for brain development seems to fall between the middle of the second and fifth months after conception (Ellis & Ames, 1987; Gladue, 1990; Meyer-Bahlburg, 1995). Exposure to the hormone levels typically experienced by female fetuses during this period may predispose a person (female or male) to be attracted to males in later life. When pregnant sheep were injected with testosterone during a similar critical period, their female offspring later showed homosexual behavior (Money, 1987).

Second, the mother's immune system may play a role in the development of sexual orientation. Men who have older brothers are somewhat more likely to be gay—about one-third more likely for each additional older brother (Blanchard, 1997, 2008; Bogaert, 2003). If the odds of homosexuality are roughly 2 percent among first sons, they would rise to nearly 3 percent among second sons, 4 percent for third sons, and so on for each additional older brother (see **FIGURE 53.3**). The reason for this curious effect—called the *older-brother* or *fraternal birth-order effect*—is unclear. But the explanation does seem biological. The effect does not occur among adopted brothers (Bogaert, 2006). Researchers suspect the mother's immune system may have a defensive response to substances produced by male fetuses. After each pregnancy with a male fetus, the maternal antibodies may become stronger and may prevent the fetal brain from developing in a typical male pattern.

GAY-STRAIGHT TRAIT DIFFERENCES

On several traits, gays and lesbians appear to fall midway between straight females and males (**TABLE 53.1**; see also LeVay, 2011; Rahman & Koerting, 2008). Gay men tend to

Table 53.1 Biological Correlates of Sexual Orientation**Gay-straight trait differences**

Sexual orientation is part of a package of traits. Studies—some in need of replication—indicate that homosexuals and heterosexuals differ in the following biological and behavioral traits:

- | | |
|-------------------------------|------------------------------------|
| • spatial abilities | • gender nonconformity |
| • fingerprint ridge counts | • age of onset of puberty in males |
| • auditory system development | • male body size |
| • handedness | • sleep length |
| • occupational preferences | • physical aggression |
| • relative finger lengths | • walking style |

On average (the evidence is strongest for males), results for gays and lesbians fall between those of straight men and straight women. Three biological influences—brain, genetic, and prenatal—may contribute to these differences.

Brain differences

- One hypothalamic cell cluster is smaller in women and gay men than in straight men.
- Gay men's hypothalamus reacts as do straight women's to the smell of sex-related hormones.

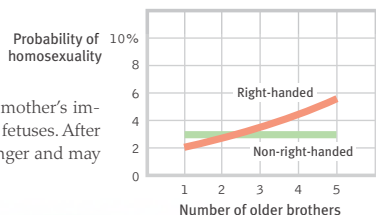
Genetic influences

- Shared sexual orientation is higher among identical twins than among fraternal twins.
- Sexual attraction in fruit flies can be genetically manipulated.
- Male homosexuality often appears to be transmitted from the mother's side of the family.

Prenatal influences

- Altered prenatal hormone exposure may lead to homosexuality in humans and other animals.
- Men with several older biological brothers are more likely to be gay, possibly due to a maternal immune-system reaction.

"Modern scientific research indicates that sexual orientation is . . . partly determined by genetics, but more specifically by hormonal activity in the womb." —GLENN WILSON AND QAZI RAHMAN, *BORN GAY: THE PSYCHOBIOLOGY OF SEX ORIENTATION*, 2005

**Figure 53.3****The fraternal birth-order effect**

Researcher Ray Blanchard (2008) offered these approximate curves depicting a man's likelihood of homosexuality as a function of his number of older brothers. This correlation has been found in several studies, but only among right-handed men (as about 9 in 10 men are).

TEACH**Common Pitfalls**

Do your students use words like “gay” or “retarded” as synonyms for “stupid”? This is a common practice with today's teens. Encourage students to refrain from this use of these words. Those who are homosexual or questioning—or who have special needs (or have siblings with special needs)—may find the use of these terms to be offensive and demeaning. It is a small way to encourage tolerance among your students.

TEACH**Teaching Tip**

Use Table 53.1 to summarize the findings regarding sexual orientation. This chart can help students understand the complex biological underpinnings of our sexual orientations. Remember, though, that correlation doesn't mean causation.

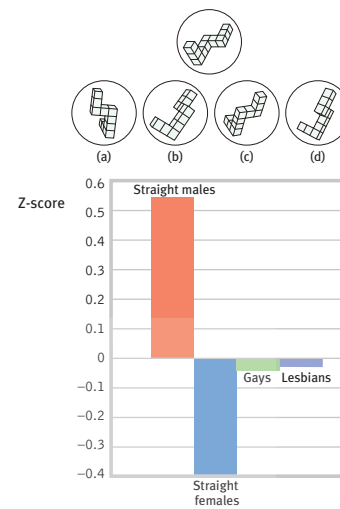
TEACH**Teaching Tip**

Have students discuss the social influences on sex role behaviors. Have them consider how we regard children who engage in atypical activities for their gender: boys who play with dolls or girls who play with trucks.

- How accepting are we of those types of behaviors?
- Does engaging in atypical sex role behaviors make one homosexual? Why not?

Figure 53.4

Spatial abilities and sexual orientation Which of the four figures can be rotated to match the target figure at the top? Straight males tend to find this an easier task than do straight females, with gays and lesbians intermediate. (From Rahman et al., 2003, with 60 people tested in each group.)



be shorter and lighter than straight men—a difference that appears even at birth. Women in same-sex marriages were mostly heavier than average at birth (Bogaert, 2010; Frisch & Zdravkovic, 2010). Data from 20 studies have also revealed handedness differences: Homosexual participants were 39 percent more likely to not be right-handed (Blanchard, 2008; Lalumière et al., 2000).

Gay-straight spatial abilities also differ. On mental rotation tasks such as the one illustrated in **FIGURE 53.4** (Vandenberg & Kuse, 1978), straight men tend to outscore straight women but the scores of gays and lesbians fall between those of straight men and women (Rahman et al., 2003). But straight women and gays both outperform straight men at remembering objects' spatial locations in tasks like those found in memory games (Hassan & Rahman, 2007).

"There is no sound scientific evidence that sexual orientation can be changed." -UK ROYAL COLLEGE OF PSYCHIATRISTS, 2009

The consistency of the brain, genetic, and prenatal findings has swung the pendulum toward a biological explanation of sexual orientation (LeVay, 2011; Rahman & Koerting, 2008). Although "much remains to be discovered," concludes Simon LeVay (2011, p. xvii), "the same processes that are involved in the biological development of our bodies and brains as male or female are also involved in the development of sexual orientation."

Before You Move On**▶ ASK YOURSELF**

What do you think would be an effective strategy for reducing teen pregnancy?

▶ TEST YOURSELF

What factors have been found to predict sexual restraint among teens?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 53 Review

53-1 How is our biological sex determined, and how do sex hormones influence prenatal and adolescent development?

- Both sex chromosomes and sex hormones influence development.
- Biological sex is determined by the father's contribution to the twenty-third pair of chromosomes.
 - The mother always contributes an *X chromosome*.
 - The father may also contribute an *X chromosome*, producing a female, or a *Y chromosome*, producing a male by triggering additional *testosterone* release and the development of male sex organs.
- During *puberty*, both *primary* and *secondary sex characteristics* develop.
- Sex-related genes and physiology influence behavioral and cognitive gender differences between males and females.

53-2 What are some of the ways that sexual development varies?

- Intersex individuals are born with intermediate or unusual combinations of male and female characteristics.
- Research suggests sex-reassignment surgery can be problematic.

53-3 How can sexually transmitted infections be prevented?

- Safe-sex practices help prevent sexually transmitted infections (STIs).
- Condoms are especially effective in preventing transmission of HIV, the virus that causes *AIDS*.
- A vaccination administered before sexual contact can prevent most human papilloma virus infections.

53-4 What factors influence teenagers' sexual behaviors and use of contraceptives?

- Rates of teen intercourse vary from culture to culture and era to era.
- Factors contributing to teen pregnancy include minimal communication about birth control with parents, partners, and peers; guilt related to sexual activity; alcohol use; and mass media norms of unprotected and impulsive sexuality.
- High intelligence, religious engagement, father presence, and participation in service learning programs have been predictors of teen sexual restraint.

53-5 What has research taught us about sexual orientation?

- *Sexual orientation* is an enduring sexual attraction toward members of one's own sex (homosexual orientation), the other sex (heterosexual orientation), or both sexes (bisexual orientation).
- Sexual orientation is not an indicator of mental health.
- There is no evidence that environmental influences determine sexual orientation.
- Evidence for biological influences includes the presence of same-sex attraction in many animal species; straight-gay differences in body and brain characteristics; higher rates in certain families and in identical twins; exposure to certain hormones during critical periods of prenatal development; and the fraternal birth-order effect.

CLOSE & ASSESS

Exit Assessment

Have students write a short essay discussing how our sex roles and behavior influence development. What aspects of sex roles and behavior does society seem to focus on? How does this focus influence development?

Answers to Multiple-Choice Questions

1. e 3. b
2. c

Answer to Practice FRQ 2 (Sample Answers)

1 point: Family studies indicate gay people's genes live on through their supporting the survival and reproductive success of their nieces, nephews, and other relatives, who also carry many of the same genes.

1 point: Twin studies indicate that genes influence sexual orientation. Identical twins (who have identical genes) are more likely than fraternal twins (whose genes are not identical) to share a homosexual orientation.

1 point: Fruit fly studies have shown that a single altered gene changed the flies' sexual orientation and behavior.

Multiple-Choice Questions

- Which of the following is an example of a primary sex characteristic?
 - Nonreproductive traits such as breasts and hips in girls
 - Facial hair in boys
 - Deepened voice in boys
 - Pubic and underarm hair in both sexes
 - Reproductive organs in both sexes
- Which of the following is a *primary* sex characteristic that changes at puberty?
 - A growth spurt in height, especially for boys
 - Development of breasts for girls
 - Full development of external genitalia in both sexes
 - Facial hair and deepened voice for boys
 - Appearance of pubic and underarm hair in both sexes
- Which of the following has been shown to be the most effective intervention to reduce teen pregnancies?
 - Abstinence-only sex education in schools
 - Participation in service learning programs
 - Increasing guilt related to sexual activity
 - Taking a pledge to remain abstinent
 - Increased exposure to sexual content in the media

Practice FRQs

- Provide examples of a primary and a secondary sex characteristic for both males and females.
- Explain three examples of evidence that suggests a genetic influence on sexual orientation.

(3 points)

Answer

1 point: Male primary sex characteristics include growth of penis and testes and first ejaculation (spermarche).

1 point: Male secondary sex characteristics include pubic hair, body hair, widening of the shoulders, and lower voice.

1 point: Female primary sex characteristics include menarche and full development of external genitalia.

1 point: Female secondary sex characteristics include pubic hair, body hair, widening of the hips, and growth of breasts.

Module 54

Adulthood: Physical, Cognitive, and Social Development

Module Learning Objectives

- 54-1** Identify the physical changes that occur during middle and late adulthood.
- 54-2** Assess the impact of aging on memory.
- 54-3** Discuss the themes and influences that mark the social journey from early adulthood to death.
- 54-4** Describe trends in people's self-confidence and life satisfaction across the life span.
- 54-5** Describe the range of reactions to the death of a loved one.

The unfolding of people's adult lives continues across the life span. It is, however, more difficult to generalize about adulthood stages than about life's early years. If you know that James is a 1-year-old and Jamal is a 10-year-old, you could say a great deal about each child. Not so with adults who differ by a similar number of years. The boss may be 30 or 60; the marathon runner may be 20 or 50; the 19-year-old may be a parent who supports a child or a child who receives an allowance. Yet our life courses are in some ways similar. Physically, cognitively, and especially socially, we differ at age 50 from our 25-year-old selves. In the discussion that follows, we recognize these differences and use three terms: *early adulthood* (roughly twenties and thirties), *middle adulthood* (to age 65), and *late adulthood* (the years after 65). Within each of these stages, people will vary widely in physical, psychological, and social development.

Physical Development

- 54-1** What physical changes occur during middle and late adulthood?

Like the declining daylight after the summer solstice, our physical abilities—muscular strength, reaction time, sensory keenness, and cardiac output—all begin an almost imperceptible decline in our mid-twenties. Athletes are often the first to notice. World-class sprinters and swimmers peak by their early twenties. Women—who mature earlier than men—also peak earlier. But most of us—especially those of us whose daily lives do not require top physical performance—hardly perceive the early signs of decline.



TEACH

TRM Discussion Starter

Use the Module 54 Fact or Falsehood? activity from the TRM to introduce the concepts from this module.

ENGAGE

Active Learning

We are seeing more and more professional athletes who still perform well into their 40s. Research who these athletes are and how their statistics have changed over the years.

- What differences have they experienced in their playing time or position over the years due to physical changes?
- What medical advances have they been able to take advantage of to prolong their athletic careers?
- Contact any or all of the athletes your students have researched to ask them how their physical abilities have changed their athletic careers as they age. How do they feel about their aging? How have they adapted?

ENGAGE**Enrichment**

Studies show that the 2 major symptoms that are attributable to menopause are hot flashes and vaginal atrophy (the lining of the vagina becomes dry, making intercourse uncomfortable). What about the other symptoms that also seem to be involved in menopause, such as irritability? These other symptoms seem more affected by individual differences and are not necessarily the norm.

ENGAGE**Active Learning**

Have students research the effects of older fathers on childhood development. Several celebrities have fathered children in old age, including Alec Baldwin, Sir Paul McCartney, and Clint Eastwood. Do children of older fathers deal with different developmental issues than children of younger parents? Why or why not?

ENGAGE**Active Learning**

Have students research how growing old is viewed in cultures that are Native American, tribal African, African American, Muslim, Hispanic, Indian, Eastern European, Western European, or Asian. Encourage students to present their findings to the class as an oral report.

menopause the time of natural cessation of menstruation; also refers to the biological changes a woman experiences as her ability to reproduce declines.

Physical Changes in Middle Adulthood

Post-40 athletes know all too well that physical decline gradually accelerates. During early and middle adulthood, physical vigor has less to do with age than with a person's health and exercise habits. Many of today's physically fit 50-year-olds run 4 miles with ease, while sedentary 25-year-olds find themselves huffing and puffing up two flights of stairs.

Aging also brings a gradual decline in fertility, especially for women. For a 35- to 39-year-old woman, the chances of getting pregnant after a single act of intercourse are only half those of a woman 19 to 26 (Dunson et al., 2002). Men experience a gradual decline in sperm count, testosterone level, and speed of erection and ejaculation. Women experience

menopause, as menstrual cycles end, usually within a few years of age 50. Expectations and attitudes influence the emotional impact of this event. Is it a sign of lost femininity and growing old? Or is it liberation from menstrual periods and fears of pregnancy? For men, too, expectations can influence perceptions. Some experience distress related to a perception of declining virility and physical capacities, but most age without such problems.

With age, sexual activity lessens. Nevertheless, most men and women remain capable of satisfying sexual activity, and most express satisfaction with their sex life. This was true of 70 percent of Canadians surveyed (ages 40 to 64) and 75 percent of Finns (ages 65 to 74) (Kontula & Haavio-Mannila, 2009; Wright, 2006). In another survey, 75 percent of respondents reported being sexually active into their eighties (Schick et al., 2010). And in an American Association of Retired Persons sexuality survey, it was not until age 75 or older that most women and nearly half of men reported little sexual desire (DeLamater & Sill, 2005). Given good health and a willing partner, the flames of desire, though simmered down, live on. As Alex Comfort (1992, p. 240) jested, "The things that stop you having sex with age are exactly the same as those that stop you riding a bicycle (bad health, thinking it looks silly, no bicycle)."



Ref. David/Corbis

Adult abilities vary widely

97-year-olds: Don't try this. In 2002, George Blair became the world's oldest barefoot water skier, just days after reaching age 87. And he did it again in 2012, at age 97!



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"Happy fortieth. I'll take the muscle tone in your upper arms, the girlish timbre of your voice, your amazing tolerance for caffeine, and your ability to digest french fries. The rest of you can stay."

"For some reason, possibly to save ink, the restaurants had started printing their menus in letters the height of bacteria." -DAVE BARRY, DAVE BARRY TURN'S FIFTY, 1998

survey, 75 percent of respondents reported being sexually active into their eighties (Schick et al., 2010). And in an American Association of Retired Persons sexuality survey, it was not until age 75 or older that most women and nearly half of men reported little sexual desire (DeLamater & Sill, 2005). Given good health and a willing partner, the flames of desire, though simmered down, live on. As Alex Comfort (1992, p. 240) jested, "The things that stop you having sex with age are exactly the same as those that stop you riding a bicycle (bad health, thinking it looks silly, no bicycle)."

Physical Changes in Later Life

Is old age "more to be feared than death" (Juvenal, *Satires*)? Or is life "most delightful when it is on the downward slope" (Seneca, *Epistulae ad Lucilium*)? What is it like to grow old?

STRENGTH AND STAMINA

Although physical decline begins in early adulthood, we are not usually acutely aware of it until later life, when the stairs get steeper, the print gets smaller, and other people seem to mumble more. Muscle strength, reaction time, and stamina diminish in late adulthood. As a lifelong basketball player, I find myself increasingly not racing for that loose ball. But even diminished vigor is sufficient for normal activities. Moreover, exercise slows aging. Active older adults tend to be mentally quick older adults. Physical exercise not only enhances muscles, bones, and energy and helps to prevent obesity and heart disease, it also stimulates brain cell development and neural connections, thanks perhaps to increased oxygen and nutrient flow (Erickson et al., 2010; Pereira et al., 2007).

SENSORY ABILITIES

With age, visual sharpness diminishes, and distance perception and adaptation to light-level changes are less acute. The eye’s pupil shrinks and its lens becomes less transparent, reducing the amount of light reaching the retina: A 65-year-old retina receives only about one-third as much light as its 20-year-old counterpart (Kline & Schieber, 1985). Thus, to see as well as a 20-year-old when reading or driving, a 65-year-old needs three times as much light—a reason for buying cars with untinted windshields. This also explains why older people sometimes ask people your age, “Don’t you need better light for reading?”

The senses of smell and hearing also diminish. In Wales, teens’ loitering around a convenience store has been discouraged by a device that emits an aversive high-pitched sound almost no one over 30 can hear (Lyll, 2005).

HEALTH

For those growing older, there is both bad and good news about health. The bad news: The body’s disease-fighting immune system weakens, making older adults more susceptible to life-threatening ailments, such as cancer and pneumonia. The good news: Thanks partly to a lifetime’s accumulation of antibodies, people over 65 suffer fewer short-term ailments, such as common flu and cold viruses. One study found they were half as likely as 20-year-olds and one-fifth as likely as preschoolers to suffer upper respiratory flu each year (National Center for Health Statistics, 1990).

THE AGING BRAIN

Up to the teen years, we process information with greater and greater speed (Fry & Hale, 1996; Kail, 1991). But compared with you, older people take a bit more time to react, to solve perceptual puzzles, even to remember names (Bashore et al., 1997; Verhaeghen & Salthouse, 1997). The neural processing lag is greatest on complex tasks (Cerella, 1985; Poon, 1987). At video games, most 70-year-olds are no match for a 20-year-old.

Slower neural processing combined with diminished sensory abilities can increase accident risks. As **FIGURE 54.1** indicates, fatal accident rates per mile driven increase sharply after age 75. By age 85, they exceed the 16-year-old level. Nevertheless, because older people drive less, they account for fewer than 10 percent of crashes (Coughlin et al., 2004).

Brain regions important to memory begin to atrophy during aging (Schacter, 1996). In early adulthood, a small, gradual net loss of brain cells begins, contributing by age 80 to a brain-weight reduction of 5 percent or so. Earlier, we noted that late-maturing frontal lobes

FYI

Most stairway falls taken by older people occur on the top step, precisely where the person typically descends from a window-lit hallway into the darker stairwell (Fozard & Popkin, 1978). Our knowledge of aging could be used to design environments that would reduce such accidents (National Research Council, 1990).



World record for longevity?

French woman Jeanne Calment, the oldest human in history with authenticated age, died in 1998 at age 122. At age 100, she was still riding a bike. At age 114, she became the oldest film actor ever, by portraying herself in *Vincent and Me*. She is shown at left at age 20 in 1895.

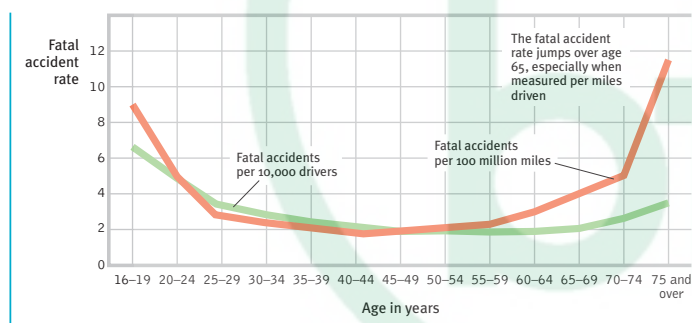


Figure 54.1

Age and driver fatalities Slowing reactions contribute to increased accident risks among those 75 and older, and their greater fragility increases their risk of death when accidents happen (NHTSA, 2000). Would you favor driver exams based on performance, not age, to screen out those whose slow reactions or sensory impairments indicate accident risk?

ENGAGE

Active Learning

You can find an example of this high-pitched “mosquito” tone on the Internet. Some students may find that they cannot hear the sound. Sensitivity to the sound is largely dependent on the level of exposure to extremely loud noises. If students attend loud concerts or listen to their iPods loudly, they may be damaging their hearing more than they realize.

ENGAGE

Enrichment

In the United Kingdom, many shopkeepers used the mosquito tone to keep groups of teenagers from loitering around their stores. However, these tones are also disturbing to children and infants, causing them to cry and become upset when exposed to the noise.

ENGAGE

Active Learning

What is it like to age physically? Students may get frustrated with older people as they move around in the world more slowly than teens. Have them experience what it is like to have arthritis, lowered visual acuity, and lower auditory thresholds by simulating these ailments using tape, gloves, modified glasses, and earplugs. They can try to do simple tasks, such as writing checks, seeing road signs, reading menus, and hearing instructions.

TEACH

Teaching Tip

Students should notice that the rate of accidents is not that much different between teens and older adults. Students will likely complain that older adults should not be allowed to drive. According to Figure 54.1, perhaps teens should not be allowed to drive either!

TEACH**Concept Connections**

Remind students about brain anatomy (from Unit III) during this section. Students should be familiar with brain anatomy so they can process what they are reading more efficiently.

TEACH**TRM Teaching Tip**

Some students may have grandparents or parents who are dealing with the effects of growing older. Help them discuss their frustrations with these effects and guide them toward more sensitive ways of interacting with older people in their lives. Use Student Activity: Growing Old from the TRM to help students experience what it is like to age.

TEACH**TRM Teaching Tip**

In Figure 54.2, Myers shows how sensory abilities decrease dramatically as people age into their 70s. However, students should notice that, for the most part, sensory acuity is relatively stable for most of adulthood. In fact, some sensory abilities get *better* in early to mid-adulthood before tapering off in later adulthood. Use Student Activity: Perceptions of Old Age from the TRM to help students see how people of different ages are perceived.

FYI

How old does a person have to be before you think of him or her as old? Depends on who you ask. For 18- to 29-year-olds, 67 was old. For those 60 and over, old was 76 (Yankelovich, 1995).

"I am still learning." -MICHELANGELO, 1560, AT AGE 85

AP® Exam Tip

This section is a good example of the complexity of seemingly simple questions. It seems like one should be able to answer a question like "Does memory decline with age?" with a straightforward yes or no. People are complex. Development is complex. We should not be surprised to learn that many factors influence memory in adulthood.

help account for teen impulsivity. Late in life, atrophy of the inhibition-controlling frontal lobes seemingly explains older people's occasional blunt questions and comments ("Have you put on weight?") (von Hippel, 2007).

As noted earlier, exercise helps counteract some effects of brain aging. It aids memory by stimulating the development of neural connections and by promoting neurogenesis, the birth of new nerve cells, in the hippocampus. Sedentary older adults randomly assigned to aerobic exercise programs exhibit enhanced memory, sharpened judgment, and reduced risk of *neurocognitive disorder* (formerly called "dementia") (Colcombe et al., 2004; Liang et al., 2010; Nazimek, 2009).

Exercise also helps maintain the telomeres, which protect the ends of chromosomes (Cherkas et al., 2008; Erickson, 2009; Pereira et al., 2007). With age, telomeres wear down, much as the tip of a shoelace frays. This wear is accentuated by smoking, obesity, or stress. As telomeres shorten, aging cells may die without being replaced with perfect genetic replicas (Epel, 2009).

The message for seniors is clear: We are more likely to rust from disuse than to wear out from overuse.

Cognitive Development**54-2** How does memory change with age?

Among the most intriguing developmental psychology questions is whether adult cognitive abilities, such as memory, intelligence, and creativity, parallel the gradually accelerating decline of physical abilities.

As we age, we remember some things well. Looking back in later life, people asked to recall the one or two most important events over the last half-century tend to name events from their teens or twenties (Conway et al., 2005; Rubin et al., 1998). Whatever people experience around this time of life—the election of Barack Obama, the events of 9/11, the civil rights movement—becomes pivotal (Pillemer, 1998; Schuman & Scott, 1989). Our teens and twenties are a time of so many memorable "firsts"—first kiss, first job, first day at college or university, first meeting of in-laws.

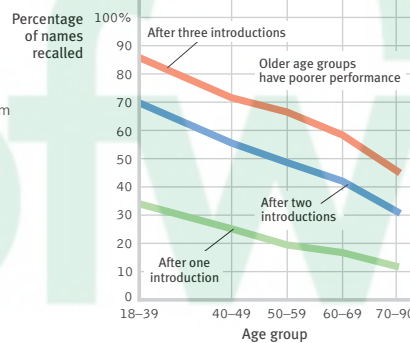
Early adulthood is indeed a peak time for some types of learning and remembering. In one test of recall, people (1205 of them) watched videotapes as 14 strangers said their names, using a common format: "Hi, I'm Larry" (Crook & West, 1990). Then those strangers re-

appeared and gave additional details. For example, they said, "I'm from Philadelphia," providing more visual *and* voice cues for remembering the person's name. As **FIGURE 54.2** shows, after a second and third replay of the introductions, everyone remembered more names, but younger adults consistently surpassed older adults.

Perhaps it is not surprising, then, that nearly two-thirds of people over age 40 say their memory is worse than it was 10 years ago (KRC, 2001). In fact, how well older people remember depends on the task. In another experiment (Schonfield & Robertson, 1966), when asked to *recognize* 24 words they had earlier tried to memorize, people showed only a minimal decline in memory. When asked to *recall* that information without clues, the decline was greater (**FIGURE 54.3**).

Figure 54.2**Tests of recall**

Recalling new names introduced once, twice, or three times is easier for younger adults than for older ones. (Data from Crook & West, 1990.)



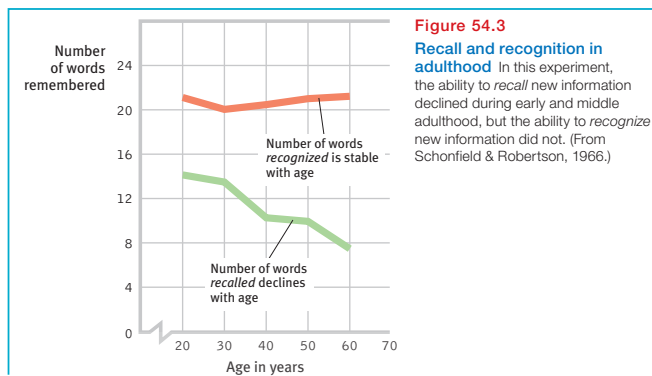


Figure 54.3
Recall and recognition in adulthood In this experiment, the ability to *recall* new information declined during early and middle adulthood, but the ability to *recognize* new information did not. (From Schonfield & Robertson, 1966.)

In our capacity to learn and remember, as in other areas of development, we differ. Younger adults vary in their abilities to learn and remember, but 70-year-olds vary much more. “Differences between the most and least able 70-year-olds become much greater than between the most and least able 50-year-olds,” reports Oxford researcher Patrick Rabbitt (2006). Some 70-year-olds perform below nearly all 20-year-olds; other 70-year-olds match or outdo the average 20-year-old.

No matter how quick or slow we are, remembering seems also to depend on the type of information we are trying to retrieve. If the information is meaningless—nonsense syllables or unimportant events—then the older we are, the more errors we are likely to make. If the information is *meaningful*, older people’s rich web of existing knowledge will help them to hold it. But they may take longer than younger adults to *produce* the words and things they know: Quick-thinking game show winners are usually young or middle-aged adults (Burke & Shafto, 2004). Older people’s capacity to learn and remember *skills* declines less than their verbal recall (Graf, 1990; Labouvie-Vief & Schell, 1982; Perlmutter, 1983).

Module 62 explores another dimension of cognitive development: intelligence. As we will see, **cross-sectional studies** (comparing people of different ages) and **longitudinal studies** (restudying the same people over time) have identified mental abilities that do and do not change as people age. Age is less a predictor of memory and intelligence than is proximity to death. Tell me whether someone is 8 months or 8 years from death and, regardless of age, you’ve given me a clue to that person’s mental ability. Especially in the last three or four years of life, cognitive decline typically accelerates (Wilson et al., 2007). Researchers call this near-death drop *terminal decline* (Backman & MacDonald, 2006).

Social Development

54-3 What themes and influences mark our social journey from early adulthood to death?

Many differences between younger and older adults are created by significant life events. A new job means new relationships, new expectations, and new demands. Marriage brings the joy of intimacy and the stress of merging two lives. The three years surrounding the birth of a child bring increased life satisfaction for most parents (Dyrdal & Lucas, 2011). The death of a loved one creates an irreplaceable loss. Do these adult life events shape a sequence of life changes?

Try This

What experiences from your high school years do you think you may never forget? (These years, and the next few, will be among the times of your life you may remember most easily when you are 50.)

cross-sectional study a study in which people of different ages are compared with one another.

longitudinal study research in which the same people are restudied and retested over a long period.

TEACH

TRM Common Pitfalls

Although all this talk of deterioration in adulthood may be depressing to teens, remind them that remaining active will help them be healthy for many years to come. Use Student Activity: Birthday Cards and Aging from the TRM to help students see how culture treats people of different ages.

TEACH

Concept Connections

Help students understand that cross-sectional and longitudinal studies can be used in both experimental and correlational research. These types of research designs apply to how the participants are chosen or grouped, not with the type of research being conducted.

TEACH

Teaching Tip

Help students see how cross-sectional and longitudinal research can have its benefits and drawbacks.

- Cross-sectional research is more efficient, in that participants are studied at one time. However, cross-sectional research is more susceptible to individual differences.
- Longitudinal research is less efficient, often taking years to complete. In addition, participant attrition is a problem. However, longitudinal research is less susceptible to individual differences, because participants are compared to themselves.

TEACH**Diversity Connections**

Explore other cultural differences in the social clock.

- How do other cultures (e.g., Hispanic/Latin, European, African, Arabic, etc.) view the timing of marriage and child rearing?
- Do the immigrants from these cultures adopt the U.S. social clock or do they keep their own cultural traditions? How many generations tend to pass before U.S. customs are chosen over traditional ones?

TEACH**Teaching Tip**

Ask students what significant life events their families have experienced since they were born. Have they moved? Changed jobs, either voluntarily or involuntarily? Added family members, either through birth, adoption, or caregiving? What effect have these life events had on the lives of their parents and their relationship with their parents?

social clock the culturally preferred timing of social events such as marriage, parenthood, and retirement.

"The important events of a person's life are the products of chains of highly improbable occurrences." -JOSEPH TRAUB, "TRAUB'S LAW," 2003

Adulthood's Ages and Stages

As people enter their forties, they undergo a transition to middle adulthood, a time when they realize that life will soon be mostly behind instead of ahead of them. Some psychologists have argued that for many the *midlife transition* is a crisis, a time of great struggle, regret, or even feeling struck down by life. The popular image of the midlife crisis is an early-forties man who forsakes his family for a younger girlfriend and a hot sports car. But the fact—reported by large samples of people—is that unhappiness, job dissatisfaction, marital dissatisfaction, divorce, anxiety, and suicide do *not* surge during the early forties (Hunter & Sundel, 1989; Mroczek & Kolarz, 1998). Divorce, for example, is most common among those in their twenties, suicide among those in their seventies and eighties. One study of emotional instability in nearly 10,000 men and women found “not the slightest evidence” that distress peaks anywhere in the midlife age range (McCrae & Costa, 1990).

For the 1 in 4 adults who report experiencing a life crisis, the trigger is not age but a major event, such as illness, divorce, or job loss (Lachman, 2004). Some middle-aged adults describe themselves as a “sandwich generation,” simultaneously supporting their aging parents and their emerging adult children or grandchildren (Riley & Bowen, 2005).

Life events trigger transitions to new life stages at varying ages. The **social clock**—the definition of “the right time” to leave home, get a job, marry, have children, or retire—varies from era to era and culture to culture. The social clock still ticks, but people feel freer about being out of sync with it.

Even *chance events* can have lasting significance, by deflecting us down one road rather than another (Bandura, 1982). Albert Bandura (2005) recalls the ironic true story of a book editor who came to one of Bandura's lectures on the “Psychology of Chance Encounters and Life Paths”—and ended up marrying the woman who happened to sit next to him. The sequence that led to my authoring this book (which was not my idea) began with my being seated near, and getting to know, a distinguished colleague at an international conference. Chance events can change our lives.

Adulthood's Commitments

Two basic aspects of our lives dominate adulthood. Erik Erikson called them *intimacy* (forming close relationships) and *generativity* (being productive and supporting future generations). Researchers have chosen various terms—*affiliation* and *achievement*, *attachment* and *productivity*, *connectedness* and *competence*. Sigmund Freud (1935) put it most simply: The healthy adult, he said, is one who can *love* and *work*.

LOVE

We typically flirt, fall in love, and commit—one person at a time. “Pair-bonding is a trademark of the human animal,” observed anthropologist Helen Fisher (1993). From an evolutionary perspective, relatively monogamous pairing makes sense: Parents who cooperated to nurture their children to maturity were more likely to have their genes passed along to posterity than were parents who didn't.

Adult bonds of love are most satisfying and enduring when marked by a similarity of interests and values, a sharing of emotional and material support, and intimate self-disclosure (see Module 79). Couples who seal their love with commitment—via (in one Vermont study) marriage for heterosexual couples and civil unions for homosexual couples—more often endure (Balsam et al., 2008). Marriage bonds are especially likely to last when couples marry after age 20 and are well educated. Compared with their counterparts of 50 years ago, people in Western countries *are* better educated and marrying later. Yet, ironically, they are nearly twice as likely to divorce. (Both Canada and the United States



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now have about one divorce for every two marriages, and in Europe, divorce is only slightly less common.) The divorce rate partly reflects women's lessened economic dependence and men's and women's rising expectations. We now hope not only for an enduring bond, but also for a mate who is a wage earner, caregiver, intimate friend, and warm and responsive lover.

Might test-driving life together in a "trial marriage" minimize divorce risk? In one Gallup survey of American twenty-somethings, 62 percent thought it would (Whitehead & Popenoe, 2001). In reality, in Europe, Canada, and the United States, those who cohabit before marriage have had *higher* rates of divorce and marital dysfunction than those who did not cohabit (Jose et al., 2010). The risk appears greatest for those cohabiting prior to engagement (Goodwin et al., 2010; Rhoades et al., 2009).

American children born to cohabiting parents are about five times more likely to experience their parents' separation than are children born to married parents (Osborne et al., 2007). Two factors contribute. First, cohabiters tend to be initially less committed to the ideal of enduring marriage. Second, they become even less marriage supporting while cohabiting.

Nonetheless, the institution of marriage endures. Worldwide, reports the United Nations, 9 in 10 heterosexual adults marry. And marriage is a predictor of happiness, sexual satisfaction, income, and physical and mental health (Scott et al., 2010). National Opinion Research Center surveys of nearly 50,000 Americans since 1972 reveal that 40 percent of married adults, though only 23 percent of unmarried adults, have reported being "very happy." Lesbian couples, too, report greater well-being than those who are alone (Peplau & Fingerhut, 2007; Wayment & Peplau, 1995). Moreover, neighborhoods with high marriage rates typically have low rates of social pathologies such as crime, delinquency, and emotional disorders among children (Myers & Scanzoni, 2005).

Marriages that last are not always devoid of conflict. Some couples fight but also shower each other with affection. Other couples never raise their voices yet also seldom praise each other or nuzzle. Both styles can last. After observing the interactions of 2000 couples, John Gottman (1994) reported one indicator of marital success: at least a five-to-one ratio of positive to negative interactions. Stable marriages provide five times more instances of smiling, touching, complimenting, and laughing than of sarcasm, criticism, and insults. So, if you want to predict which newlyweds will stay together, don't pay attention to how passionately they are in love. The couples who make it are more often those who refrain from putting down their partners. To prevent a cancerous negativity, successful couples learn to fight fair (to state feelings without insulting) and to steer conflict away from chaos with comments like "I know it's not your fault" or "I'll just be quiet for a moment and listen."

Often, love bears children. For most people, this most enduring of life changes is a happy event. "I feel an overwhelming love for my children unlike anything I feel for anyone else," said 93 percent of American mothers in a national survey (Erickson & Aird, 2005). Many fathers feel the same. A few weeks after the birth of my first child I was suddenly struck by a realization: "So *this* is how my parents felt about me?"

When children begin to absorb time, money, and emotional energy, satisfaction with the marriage itself may decline (Doss et al., 2009). This is especially likely among employed women who, more than they expected, carry the traditional burden of doing the chores at home. Putting effort into creating an equitable relationship can thus pay double dividends: a more satisfying marriage, which breeds better parent-child relations (Erel & Burman, 1995).

Although love bears children, children eventually leave home. This departure is a significant and sometimes difficult event. For most people, however, an empty nest is a happy place (Adelmann et al., 1989; Gorchoff et al., 2008). Many parents experience a "postlaunch honeymoon," especially if they maintain close relationships with their children (White & Edwards, 1990). As Daniel Gilbert (2006) has said, "The only known symptom of 'empty nest syndrome' is increased smiling."



Love Intimacy, attachment, commitment—love by whatever name—is central to healthy and happy adulthood.

Try This

What do you think? Does marriage correlate with happiness because marital support and intimacy breed happiness, because happy people more often marry and stay married, or both?

"Our love for children is so unlike any other human emotion. I fell in love with my babies so quickly and profoundly, almost completely independently of their particular qualities. And yet 20 years later I was (more or less) happy to see them go—I had to be happy to see them go. We are totally devoted to them when they are little and yet the most we can expect in return when they grow up is that they regard us with bemused and tolerant affection."
—DEVELOPMENTAL PSYCHOLOGIST ALISON GOPNIK, "THE SUPREME INFANT," 2010



TEACH

Common Pitfalls

Many of your students may be children of divorced parents. Although research shows that is common today, many students may feel alone and confused when their parents split. Encourage healthy discussion of how to handle being a child of divorce so students know they are part of a growing segment of society that knows what divorce is like firsthand.

ENGAGE

Active Learning

Have students develop a pamphlet or presentation for younger children about how to handle being a child of divorce. Encourage them to contact local psychologists who specialize in counseling children and families dealing with divorce for research-based tips they can offer others. This type of activity can help students deal with feelings they may have about their experiences with divorce.

TEACH

Concept Connections

Use the "Try This" on this page to help students remember the maxim "correlation does not mean causation." In studies of happiness in marriage, we do not know in which direction the variables work. We call this the *directionality problem* with correlations.

ENGAGE

Active Learning

Develop a project in which students research the laws concerning divorce and child custody in your state, as well as other states in which students might be interested. Individuals, partners, or small groups may take part in the research. After research findings are presented, lead a class discussion on the following questions.

- Do these laws seem to encourage or discourage divorce?
- What seem to be the biases the justice system has concerning divorce?

TEACH**Teaching Tip**

Have students share what the division of labor is among their own family members.

- Who does the most chores? Why?
- Who does the fewest chores? Why?
- How did the agreement about the divisions of labor occur in their families? Do they think those divisions are still satisfactory?

TEACH**TRM Teaching Tip**

Students can share whether their parents will be experiencing an empty nest upon their graduation from high school.

- How are your parents handling the impending “loss” of a child from their daily lives?
- Are they becoming more or less emotional toward you?
- Do they seem happy or sad or indifferent about the change?
- How do you feel about leaving your parents “alone”?

Use Student Activity: Writing Letters to Parents and Children from the TRM to help students understand the perspective of adults.

Job satisfaction and life satisfaction Work can provide us with a sense of identity and competence and opportunities for accomplishment. Perhaps this is why challenging and interesting occupations enhance people’s happiness.

**WORK**

For many adults, the answer to “Who are you?” depends a great deal on the answer to “What do you do?” For women and men, choosing a career path is difficult, especially during bad economic times. Even in the best of times, few students in their first two years of college or university can predict their later careers.

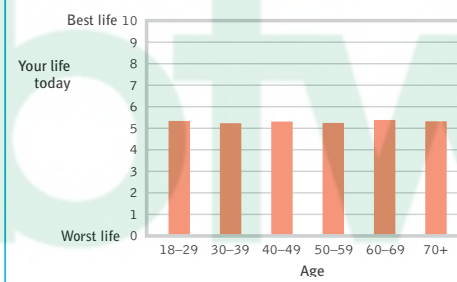
In the end, happiness is about having work that fits your interests and provides you with a sense of competence and accomplishment. It is having a close, supportive companion who cheers your accomplishments (Gable et al., 2006). And for some, it includes having children who love you and whom you love and feel proud of.

Well-Being Across the Life Span**54-4** Do self-confidence and life satisfaction vary with life stages?

“When you were born, you cried and the world rejoiced. Live your life in a manner so that when you die the world cries and you rejoice.” —NATIVE AMERICAN PROVERB

Figure 54.4

Age and life satisfaction The Gallup Organization asked 142,682 people worldwide to rate their lives on a ladder, from 0 (“the worst possible life”) to 10 (“the best possible life”). Age gave no clue to life satisfaction (Crabtree, 2010).



To live is to grow older. This moment marks the oldest you have ever been and the youngest you will henceforth be. That means we all can look back with satisfaction or regret, and forward with hope or dread. When asked what they would have done differently if they could relive their lives, people’s most common answer has been “Taken my education more seriously and worked harder at it” (Kinnier & Metha, 1989; Roes & Summerville, 2005). Other regrets—“I should have told my father I loved him,” “I regret that I never went to Europe”—have also focused less on mistakes made than on the things one *failed* to do (Gilovich & Medvec, 1995).

From the teens to midlife, people typically experience a strengthening sense of identity, confidence, and self-esteem (Huang, 2010; Robins & Trzesniewski, 2005). In later life, challenges arise: Income shrinks. Work is often taken away. The body deteriorates. Recall fades. Energy wanes. Family members and friends die or move away. The great enemy, death, looms ever closer. And for those in the terminal decline phase, life satisfaction does decline as death approaches (Gerstorf et al., 2008).

Small wonder that most presume that happiness declines in later life (Lacey et al., 2006). But worldwide, as Gallup researchers discovered, most find that the over-65 years are not notably unhappy (**FIGURE 54.4**). If anything, positive feelings, supported by enhanced emotional control, grow after midlife, and negative feelings subside (Stone et al., 2010; Urry & Gross, 2010). Older adults increasingly use words that convey positive emotions (Pennebaker & Stone, 2003), and they attend less and less to negative information. Compared with younger adults, for example, they are slower to perceive negative faces and more attentive to positive news (Carstensen & Mikels, 2005; Scheibe & Carstensen, 2010). Older adults also have fewer problems in their social relationships (Fingerman & Charles, 2010), and they experience less intense anger, stress, and worry (Stone et al., 2010).

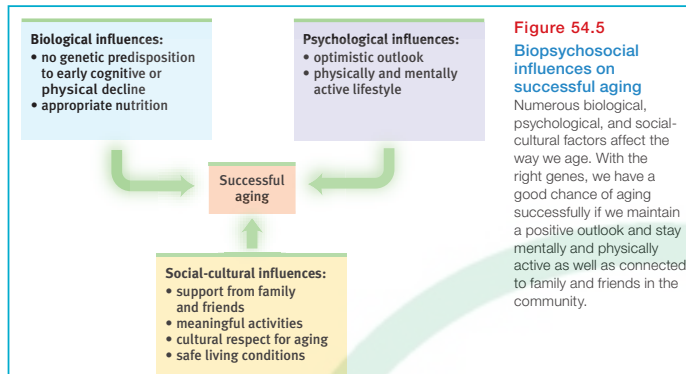
ENGAGE**Enrichment**

Amy Wrzesniewski studies whether people view their occupations as jobs, careers, or callings. In one study of hospital janitors, she found that the participants fell into one of these categories. Janitors who viewed their work as a job wouldn’t work overtime unless paid extra. Janitors who viewed work as a career would work for advancement and recognition from superiors. Those who viewed being a janitor as a calling would participate in

patient care, talking with patients and helping them get things they needed. One’s attitude about an occupation can determine how positively one views that work.

The aging brain may help nurture these positive feelings. Brain scans of older adults show that the amygdala, a neural processing center for emotions, responds less actively to negative events (but not to positive events), and it interacts less with the hippocampus, a brain memory-processing center (Mather et al., 2004; St. Jacques et al., 2009; Williams et al., 2006). Brain-wave reactions to negative images also diminish with age (Kisley et al., 2007).

Moreover, at all ages, the bad feelings we associate with negative events fade faster than do the good feelings we associate with positive events (Walker et al., 2003). This contributes to most older people's sense that life, on balance, has been mostly good. Given that growing older is an outcome of living (an outcome most prefer to early dying), the positivity of later life is comforting. Thanks to biological, psychological, and social-cultural influences, more and more people flourish into later life (FIGURE 54.5).



"At 20 we worry about what others think of us. At 40 we don't care what others think of us. At 60 we discover they haven't been thinking about us at all."
-ANONYMOUS

"The best thing about being 100 is no peer pressure."
-LEWIS W. KUESTER, 2005, ON TURNING 100

Death and Dying

54-5 A loved one's death triggers what range of reactions?

Warning: If you begin reading the next paragraph, you will die.

But of course, if you hadn't read this, you would still die in due time. Death is our inevitable end. Most of us will also suffer and cope with the deaths of relatives and friends. Usually, the most difficult separation is from a spouse—a loss suffered by five times more women than men. When, as usually happens, death comes at an expected late-life time, grieving may be relatively short-lived.

Grief is especially severe when a loved one's death comes suddenly and before its expected time on the social clock. The sudden illness or accident claiming a 45-year-old life partner or a child may trigger a year or more of memory-laden mourning that eventually subsides to a mild depression (Lehman et al., 1987).

For some, however, the loss is unbearable. One Danish long-term study of more than 1 million people found that about 17,000 of them had suffered the death of a child under 18. In the five years following that death, 3 percent of them had a first psychiatric hospitalization. This rate was 67 percent higher than the rate recorded for parents who had not lost a child (Li et al., 2005).

Even so, reactions to a loved one's death range more widely than most suppose. Some cultures encourage public weeping and wailing; others hide grief. Within any culture,

"Love—why, I'll tell you what love is: It's you at 75 and her at 71, each of you listening for the other's step in the next room, each afraid that a sudden silence, a sudden cry, could mean a lifetime's talk is over."
-BRIAN MOORE, *THE LUCK OF GINGER COFFEY*, 1960

ENGAGE

TRM Active Learning

Research findings have suggested that a higher perceived purpose in life is associated with less fear of death. Help students explore the issue of death with these questions.

- What are the different socially acceptable ways people should feel about death?
- Did American poet Jesse Stuart speak the truth when, in recovering from a near-fatal heart attack, he said, "No man really begins to live until he has come close to dying"?
- Do you think acceptance of the inevitability of death is what gives meaning to life? Explain your answer.

Use Student Activity: Your Lot in Life from the TRM to have students explore how development affects life events.

TEACH

TRM Common Pitfalls

Be sensitive to students who may have experienced a death in their lives. Some students may want to talk about their loss, whereas others may not. You may want to let students know in advance that you will be teaching about death and dying so they can let you know whether they are comfortable with the topic. Use Student Activity: Attitudes Toward the Elderly from the TRM to help students think about views of older people.

ENGAGE

TRM Active Learning

Have students write their own obituaries. Model the obituaries after those found in the newspaper. They should write what they want people to remember about them, reflecting on what they anticipate their life span will be. Use Student Activity: Writing a Biography from the TRM for students to help an older adult write his or her biography.

ENGAGE**TRM Active Learning**

Have students construct a “lifeline” on a line they draw across a piece of notebook paper. They should label their birthday on the far left, project their death date on the far right, and show the day’s date at the appropriate place along this continuum. Students should note important events from their childhood and adolescence to the left and some future life events to the right of the day’s date. Encourage students to compare and contrast events on their lifelines with a classmate. Finally, allow volunteers to tell the class what they learned from the exercise and how it relates to concepts about adulthood and aging that they read about in this module. Use Student Activity: Life Span Development from the TRM to further explore the concept of adulthood.

ENGAGE**TRM Enrichment**

Many students may have heard of Elizabeth Kübler-Ross’s theory about the stages of dying. Although research does not support predictable stages, you may want to review Kübler-Ross’s stages so students have a point of reference for this discussion:

- Denial
- Anger
- Bargaining
- Depression
- Acceptance

Use Student Activity: The Medical Directive from the TRM to help students think about late adulthood issues.

“Consider, friend, as you pass by, as you are now, so once was I. As I am now, you too shall be. Prepare, therefore, to follow me.”
-SCOTTISH TOMBSTONE EPITAPH

individuals differ. Given similar losses, some people grieve hard and long, others less so (Ott et al., 2007). Contrary to popular misconceptions, however,

- terminally ill and bereaved people do not go through identical predictable stages, such as denial before anger (Friedman & James, 2008; Nolen-Hoeksema & Larson, 1999). A Yale study following 233 bereaved individuals through time did, however, find that yearning for the loved one reached a high point four months after the loss, with anger peaking, on average, about a month later (Maciejewski et al., 2007).
- those who express the strongest grief immediately do not purge their grief more quickly (Bonanno & Kaltman, 1999; Wortman & Silver, 1989).
- bereavement therapy and self-help groups offer support, but there is similar healing power in the passing of time, the support of friends, and the act of giving support and help to others (Baddeley & Singer, 2009; Brown et al., 2008; Neimeyer & Carrier, 2009). Grieving spouses who talk often with others or receive grief counseling adjust about as well as those who grieve more privately (Bonanno, 2004; Stroebe et al., 2005).

We can be grateful for the waning of death-denying attitudes. Facing death with dignity and openness helps people complete the life cycle with a sense of life’s meaningfulness and unity—the sense that their existence has been good and that life and death are parts of an on-going cycle. Although death may be unwelcome, life itself can be affirmed even at death. This is especially so for people who review their lives not with despair but with what Erik Erikson called a sense of *integrity*—a feeling that one’s life has been meaningful and worthwhile.

Before You Move On**▶ ASK YOURSELF**

In what ways are you looking forward to adulthood? What concerns do you have about your own transition into adulthood, and how do you think you might address them?

▶ TEST YOURSELF

Research has shown that living together before marriage predicts an increased likelihood of future divorce. Can you imagine two possible explanations for this correlation?

Answers to the Test Yourself questions can be found in Appendix E at the end of the book.

Module 54 Review**54-1** What physical changes occur during middle and late adulthood?

- Muscular strength, reaction time, sensory abilities, and cardiac output begin to decline in the late twenties and continue to decline throughout middle adulthood (roughly age 40 to 65) and late adulthood (the years after 65).
- Women’s period of fertility ends with *menopause* around age 50; men have no similar age-related sharp drop in hormone levels or fertility.
- In late adulthood, the immune system weakens, increasing susceptibility to life-threatening illnesses.
- Chromosome tips (telomeres) wear down, reducing the chances of normal genetic replication.
- But for some, longevity-supporting genes, low stress, and good health habits enable better health in later life.

54-2 How does memory change with age?

- As the years pass, recall begins to decline, especially for meaningless information, but recognition memory remains strong.
- Developmental researchers study age-related changes (such as memory) with *cross-sectional studies* (comparing people of different ages) and *longitudinal studies* (retesting the same people over a period of years).
- “Terminal decline” describes the cognitive decline in the final few years of life.

54-3 What themes and influences mark our social journey from early adulthood to death?

- Adults do not progress through an orderly sequence of age-related social stages. Chance events can determine life choices.
- The *social clock* is a culture’s preferred timing for social events, such as marriage, parenthood, and retirement.
- Adulthood’s dominant themes are love and work, which Erikson called intimacy and generativity.

54-4 Do self-confidence and life satisfaction vary with life stages?

- Self-confidence tends to strengthen across the life span.
- Surveys show that life satisfaction is unrelated to age. Positive emotions increase after midlife and negative ones decrease.

54-5 A loved one’s death triggers what range of reactions?

- People do not grieve in predictable stages, as was once supposed.
- Strong expressions of emotion may not purge grief, and bereavement therapy is not significantly more effective than grieving without such aid.
- Erikson viewed the late-adulthood psychosocial task as developing a sense of integrity (versus despair).

Multiple-Choice Questions

- Which of the following changes does *not* occur with age?
 - Visual sharpness diminishes.
 - Distance perception is less acute.
 - Adaptation to light-level changes is less rapid.
 - The lens of the eye becomes more transparent.
 - Senses of smell and hearing diminish.
- As telomeres shorten, aging cells may die without being replaced with perfect genetic replicas. This process is slowed by
 - smoking.
 - obesity.
 - stress.
 - aging.
 - exercise.
- According to Erikson, which of the following is a dominant goal of adulthood?
 - Competence
 - Generativity
 - Performance
 - Identity
 - Connectedness
- The aging brain may help nurture positive feelings that are reported by many older adults. Brain scans of older adults show that the _____, a neural processing center for emotions, responds less actively to negative events (but not to positive events), and it interacts less with the hippocampus, a brain memory-processing center.
 - amygdala
 - hypothalamus
 - pineal gland
 - thyroid gland
 - thalamus

CLOSE & ASSESS**Exit Assessment**

Have students reflect on the social clock. How much does the social clock influence their lives? Do they have specific plans for their future, such as when they hope to marry, have children, or accomplish a lifelong goal? What are their plans for achieving those goals? How might development affect those goals?

Answers to Multiple-Choice Questions

- d
- e
- b
- a

ENGAGE**TRM Enrichment**

Some remarkable achievements have come late in life to certain individuals:

- Bertrand Russell formed the Committee of 100, a radical organization devoted to nuclear disarmament, at 88.
- Frank Lloyd Wright completed the design for the Guggenheim Museum in New York City at 91.
- Paul Spangler completed his 14th marathon at 92.
- Dr. Benjamin Spock published *A Better World for Our Children* at 91.
- Cecil B. DeMille produced the film *The Ten Commandments* at 75.
- Claude Monet began his *Water Lilies* series at 73.
- George Burns launched a new movie career and won an Oscar for *The Sunshine Boys* at age 80 (and, at 94, performed at Proctor’s Theater in Schenectady, NY—63 years after he first played there).
- Pope John XXIII was elected at 76.
- Konrad Adenauer won the election that allowed him to lead West Germany to reconstruction at 72.
- Charles de Gaulle returned to power in France at the age of 68.

Clearly, some individuals remain creative and productive throughout their lives. Use Student Activity: The Bucket List from the TRM to help students think about living life without regret.

Stevens-Long, J., & Commons, M. (1992). *Adult life: Developmental processes* (4th ed.). Mountain View, CA: Mayfield Publishing Co.

5. d 7. e
6. d

Answer to Practice FRQ 2

1 point: **Biological influences:** no genes predisposing dementia or other diseases, appropriate nutrition

1 point: **Psychological influences:** optimistic outlook, physically and mentally active lifestyle

1 point: **Social-cultural influences:** support from family and friends, cultural respect for aging, safe living conditions

5. Which of the following is true of menopause?

- Both men and women experience menopause around the age of 50.
- Men experience menopause around 50 years of age, but women experience menopause around 65 years of age.
- Women experience menopause around 50 years of age, but men experience menopause around 65 years of age.
- Women experience menopause around the age of 50, but men don't experience menopause.
- Men experience menopause around the age of 65, but women don't experience menopause.

6. Which of the following would be considered an example of Erikson's concept of generativity?

- A 25-year-old meets and marries the love of his life.
- A 35-year-old earns a lot of money, though she doesn't particularly enjoy her job.
- An 85-year-old looks back at a life well-lived and feels satisfied.
- A 40-year-old takes pride in her work and how she has raised her children.
- A 20-year-old decides to become a physician.

7. The _____ is a culturally determined timetable for certain events, such as having children and retirement.

- critical period
- menopause
- intimacy phase
- attachment stage
- social clock

Practice FRQs

1. Describe two changes in cognitive ability during adulthood. What is one factor that can prevent the steepest decline?

Answer

1 point: There is a decline in recall over the course of adulthood.

1 point: There is a decline in speed of processing over the adult years.

1 point: Exercise can prevent the steepest decline.

2. Numerous biological, psychological, and social-cultural factors affect the way we age. Explain one example for each of the three that contributes to successful aging.

(3 points)

ENGAGE

Enrichment

Ask students to conduct research about Alzheimer's disease and senile dementia.

- What are the causes, symptoms, and treatments for each?
- How can doctors make a definitive diagnosis for either? Are they often misdiagnosed?
- What are some early warning signs?
- What percentage of older people suffers from these disorders?

Unit IX Review

Key Terms and Concepts to Remember

developmental psychology, p. 462	concrete operational stage, p. 483	social identity, p. 519
zygote, p. 466	formal operational stage, p. 483	intimacy, p. 521
embryo, p. 466	stranger anxiety, p. 488	emerging adulthood, p. 523
fetus, p. 466	attachment, p. 488	X chromosome, p. 526
teratogens, p. 467	critical period, p. 489	Y chromosome, p. 526
fetal alcohol syndrome (FAS), p. 467	imprinting, p. 489	testosterone, p. 526
habituation, p. 468	temperament, p. 490	puberty, p. 527
maturation, p. 471	basic trust, p. 492	primary sex characteristics, p. 527
cognition, p. 476	self-concept, p. 495	secondary sex characteristics, p. 527
schema, p. 477	gender, p. 500	menarche [meh-NAR-key], p. 527
assimilation, p. 477	aggression, p. 501	AIDS (acquired immune deficiency syndrome), p. 529
accommodation, p. 477	gender role, p. 503	sexual orientation, p. 531
sensorimotor stage, p. 478	role, p. 503	menopause, p. 540
object permanence, p. 478	gender identity, p. 504	cross-sectional study, p. 543
preoperational stage, p. 479	social learning theory, p. 504	longitudinal study, p. 543
conservation, p. 479	gender typing, p. 504	social clock, p. 544
egocentrism, p. 479	transgender, p. 505	
theory of mind, p. 480	adolescence, p. 513	
autism spectrum disorder (ASD), p. 481	identity, p. 519	

Key Contributors to Remember

Jean Piaget, p. 476	Margaret Harlow, p. 489	Albert Bandura, pp. 504, 544
Lev Vygotsky, p. 484	Mary Ainsworth, p. 490	Lawrence Kohlberg, p. 515
Konrad Lorenz, p. 489	Diana Baumrind, p. 496	Erik Erikson, p. 519
Harry Harlow, p. 489	Carol Gilligan, p. 502	Sigmund Freud, p. 544

AP® Exam Practice Questions

Multiple-Choice Questions

1. What aspect of development did Jean Piaget's development theory focus on?
 - a. Social
 - b. Moral
 - c. Cognitive
 - d. Physical
 - e. Ego
2. According to Erikson's psychosocial theory of development, the crisis that needs resolution for adolescents involves the search for what?
 - a. Trust
 - b. Identity
 - c. Autonomy
 - d. Initiative
 - e. Worth

Answers to Multiple-Choice Questions

1. c
2. b

3. d 8. a 13. e
 4. c 9. e 14. c
 5. a 10. d 15. b
 6. a 11. d
 7. b 12. a

Rubric for Free Response Question 2

1 point: **Concrete operational:** From ages 7–12, children show the beginnings of adult logic. They recognize that different people see things differently. Possible example: conservation. ↻ p. 483

1 point: **Formal operational:** After about age 12, children can think more flexibly, engage in logical thought, hypothesize, and formulate arguments using abstract reasoning. Possible examples: Might involve developing a theory and/or formulating arguments based on abstract concepts, or developing arguments supporting conclusions opposite to the young person's current beliefs/conclusions. ↻ p. 483

1 point: **Identity versus role confusion:** During adolescence, young people usually develop a firm sense of who they are and what they stand for. Possible examples: They may learn to develop friendships and feel comfortable with ways of behaving in social situations, cultivate new friendships and social groups, and feel confident in their chosen identities. This confidence can strengthen their relationships with parents and friends. ↻ p. 520

3. What is the correct term for a period of time when certain events must take place in order to facilitate proper development?
 a. Conservation stage
 b. Preoperational stage
 c. Attachment period
 d. Critical period
 e. Assimilation step
4. Which of the following statements about the impact of aging is *true*?
 a. During old age, many of the brain's neurons die.
 b. If we live to be 90 or older, most of us will eventually become senile.
 c. Older people become less susceptible to short-term illnesses.
 d. Recognition memory—the ability to identify things previously experienced—declines with age.
 e. Life satisfaction peaks in the 50s and then gradually declines after age 65.
5. According to Lawrence Kohlberg, what stage of moral development is exhibited when actions are judged “right” because they flow from basic ethical principles?
 a. Postconventional
 b. Preconventional
 c. Conventional
 d. Preoperational
 e. Formal operational
6. According to Mary Ainsworth's research on attachment, what would a child need most to become “securely attached”?
 a. Consistent, responsive caregivers
 b. The right temperament
 c. A terry cloth-wrapped “surrogate” mother
 d. An imprinting experience shortly after birth
 e. Enriched motor development experiences
7. Temperament refers to what aspect of an infant's development?
 a. Susceptibility to infection and disease
 b. Emotional reactivity
 c. General intelligence
 d. Level of optimism
 e. Ability to learn from situations
8. How does fluid intelligence change as we age?
 a. Decreases slowly with age
 b. Has not been measured over time
 c. Increases slowly with age
 d. Does not change until about age 75
 e. Remains unchanged if we exercise
9. Once a sperm penetrates the cell wall of an egg and fertilizes it, this structure is known as what?
 a. An embryo
 b. A fetus
 c. Placenta
 d. A teratogen
 e. A zygote
10. Social development researchers suggest that infancy's major social achievement is attachment. Childhood's major social achievement is developing which of the following?
 a. Basic trust
 b. Into a sexually mature person
 c. Intimacy
 d. A positive sense of self
 e. Object permanence
11. Most adolescents can ponder and debate human nature, good and evil, truth and justice. According to Piaget, this thinking ability is due to the emergence of which stage?
 a. Concrete operational
 b. Sensorimotor
 c. Preoperational
 d. Formal operational
 e. Accommodation
12. Cultural norms related to when to leave home, get a job, or marry are referred to as what?
 a. Social clock
 b. Midlife crisis
 c. Critical period
 d. Life span
 e. Theory of mind
13. The more often the stimulus is presented, the weaker the response becomes. What do developmental researchers call this decrease in response intensity due to repeated stimulation?
 a. Stagnation
 b. Attachment
 c. Autonomy
 d. Imprinting
 e. Habituation
14. Eleanor Maccoby's research found which of the following factors to be the *least* positively correlated with problem behavior in preschool children?
 a. Parent income
 b. Parent education level
 c. Time spent in day care
 d. Child's temperament
 e. Parent sensitivity

1 point: **Intimacy versus isolation:** In late adolescence and early adulthood, key tasks are forming intimate relationships with friends, finding a significant other, dating, and sharing values that develop compatible relationships. Possible examples: Young people often start dating in high school, and continue to explore their internal sense of what it means to have an intimate partner in life and how they define and behave in “serious relationships.” Also, young people begin to define how much of their energy they choose to spend with intimate others and how much they reserve for their personal interests, hobbies, and careers. ↻ p. 520

1 point: **Conventional level:** Typically begins in middle childhood, but many people do not go beyond judging right and wrong, conforming to conventional standards, and following the rules that maintain social order. Possible examples: Moral choices in this stage involve following the rules of others, such as parents' rules about coming home on time or not cheating in school. Following rules established by other authority figures (such as school and/or cultural rules) also fit in this stage. ↻ pp. 515–517

15. Which of these is an example of a longitudinal study?

- The depth perception of infants is measured once a month for 6 months in a row, starting at six months.
- In the same month, researchers compare the reaction time of 20 sixth graders and 20 first graders.
- The memory of one group of 50-year-old adults is measured and then 20 years later compared to a different group of 70-year-olds.
- A psychologist develops a case study of a woman who is 102 by interviewing her twice a week for 12 weeks.
- Researchers compare curiosity ratings of a group of toddlers with that same group's SAT scores 15 years later.

Free-Response Questions

1. Adolescence has been called a time of “storm and stress.” Describe how each of the following brain areas or psychological concepts might contribute to this storm and stress.

- Limbic system activity
- Frontal lobe development
- Formal operational abilities
- Erikson's identity versus role confusion stage
- Early physical maturation for girls

Rubric for Free Response Question 1

1 point: The limbic system is primed by surges of hormones at puberty, which may lead some adolescents to seek excitement and, possibly, behave impulsively. [Page 514](#)

1 point: Frontal lobes, which are necessary for judgment and planning, continue to develop during adolescence and into the early twenties. Unused pathways are pruned and myelin speeds the connection between the frontal lobes and other areas of the brain. Without completed frontal lobe development, adolescents are often unable to exert adult impulse control. They may be more likely to indulge in risky and/or illegal behaviors despite understanding the possible consequences. [Pages 471, 514](#)

1 point: When adolescents reach the formal operational stage, they have all of the cognitive abilities of earlier stages and can also think abstractly and hypothetically. With the ability to compare reality with a hypothetical ideal, adolescents may be disappointed in what exists, may detect hypocrisy, or may argue with those around them about how to achieve a more just world. [Page 483](#)

1 point: During Erikson's identity versus role confusion stage, teenagers seek a sense of identity. Adolescents typically try out different versions of “self” before adopting a comfortable identity. This process can be difficult and can lead to conflicts with friends and family. [Pages 519–521](#)

1 point: Early maturation puts some girls out of sync with their emotional development and friends' experiences. They may begin associating with older teens or endure teasing or sexual harassment. [Page 514](#)

2. Piaget, Erikson, and Kohlberg described several cognitive, social, and moral reasoning stages of adolescence. Illustrate each of the following stages.

- Concrete operational
- Formal operational
- Identity versus role confusion
- Intimacy versus isolation
- Conventional level
- Postconventional level

(6 points)

3. Cruz and Eva have a 7-year-old son. He is in the second grade and is extremely obedient. He has many friends, most of whom are on a baseball team with him.

What advice might each of the researchers below give to Cruz and Eva about their son's development?

- Jean Piaget (cognitive development)
- Harry and Margaret Harlow (attachment)
- Lawrence Kohlberg (moral levels of thinking)
- Albert Bandura (social learning theory)
- Erik Erikson (psychosocial development)
- Diana Baumrind (parenting styles)
- Lev Vygotsky (scaffolding)

(7 points)

Multiple-choice self-tests and more may be found at www.worthpublishers.com/MyersAP2e

1 point: Diana Baumrind might recommend the authoritative parenting style because it could teach their son to be less rigid, develop good social skills, manage conflict, regulate his emotions, and have a high level of self-confidence. [p. 496](#)

1 point: Lev Vygotsky would want Cruz and Eva to pay attention to their son's current skill level and think about what the next most appropriate challenge might be for him (students could use the terms “zone of proximal development” and/or “scaffolding” to describe this type of analysis). [p. 484](#)

1 point: Postconventional level:

Moral reasoning is based on the person's own moral standards; during adolescence and adulthood the importance of others' needs are considered and universal ethical principles are understood. Possible examples: Moral reasoning in this stage may involve personal choice and reasoning, rather than following the rules of others without justification. Examples might include decisions about political stances, such as joining a group working for equal rights for gay couples, or believing that private organizations have the right to choose their own membership rules. [pp. 515–517](#)

Rubric for Free Response Question 3

1 point: Jean Piaget might explain that Cruz and Eva's son is in either the preoperational stage or the concrete stage. If the child understands the law of conservation, then he is in the latter of those stages. [pp. 476–483](#)

1 point: The Harlows might emphasize the importance of physical bonding and companionship to the cognitive and social development of Cruz and Eva's son. [p. 489](#)

1 point: Lawrence Kohlberg might have advised the parents that their son is likely in the preconventional level, where he is obedient and avoids punishment, or in the conventional level, with an example of Cruz and Eva explaining to their son conformity to law and rules. [pp. 515–517](#)

1 point: Albert Bandura might explain to Cruz and Eva that they could make sure to display behaviors to their son that they would want him to imitate, like sharing. [p. 544](#)

1 point: Erik Erikson would stress the importance of their son feeling competent so that he feels secure and responsible in school and with other talents, including baseball (per this example). This social development stage is competence versus inferiority. [p. 492](#)