3 : Nature, Nurture, and Human Diversity

CHAPTER OVERVIEW

Chapter 3 is concerned with the ways in which our biological heritage, or nature, interacts with our individual experiences, or nurture, to shape who we are. After a brief explanation of basic terminology, the chapter explores the fields of behavior genetics, which studies twins and adopted children to weigh genetic and environmental influences on behaviors, and molecular genetics, which focuses on the specific genes that influence behavior. The next section discusses psychology's use of evolutionary principles to answer universal questions about human behavior.

The next two sections of the chapter shift the spotlight to focus on environmental influences on behavior. The impact of parents, the prenatal environment, early experience, peers, and culture on the development of the brain and behavior are each discussed in depth. The final section of the chapter explores how genes and environment interact to shape both the biological and social aspects of our gender. In the end, the message is clear: our genes and our experience together form who we are.

NOTE: Answer guidelines for all Chapter 3 questions begin on page 87.

CHAPTER REVIEW

First, skim each section, noting headings and boldface items. After you have read the section, review each objective by answering the fill-in and essay-type questions that follow it. As you proceed, evaluate your performance by consulting the answers beginning on page 87. Do not continue with the next section until you understand each answer. If you need to, review or reread the section in the textbook before continuing.

Introduction (pp. 95–96)

Objective 1: Give examples of differences and of similarities within the human family.

1. Our differences as humans include our _____ , _____ , and _____ and _____ backgrounds.
2. Our similarities as human beings include our common _____ _____ , our shared _____ architecture, our ability to use _____ , and our _____ behaviors.
3. A fundamental question in psychology deals with the extent to which we are shaped by our heredity, called our _____ , and by our life history, called our _____ .

Behavior Genetics: Predicting Individual Differences (pp. 96–107)

David Myers at times uses idioms that are unfamiliar to some readers. If you do not know the meaning of the following words, phrases, or expressions in the context in which they appear in the text, refer to pages 93–94 for an explanation: *To disentangle the threads of heredity and environment, behavior geneticists often use two sets of tweezers; blue-collar families; stories of startling twin similarity; "Mom may be holding a full house while Dad has a straight flush"; yen; the area of a field is more the result of its length or width; sleuth; Blueprints; two-edged sword.*

Objective 2: Describe the types of questions that interest behavior geneticists.

1. Researchers who specifically study the effects of genes on behavior are called _____ _____ .
2. The term *environment* refers to every _____ influence.

Objective 3: Define *chromosome, DNA, gene,* and *genome,* and describe their relationships.

3. The master plans for development are stored in the _____ . In number, each person inherits _____ of these structures, _____ from each parent. Each is composed of a coiled chain of the molecule _____ .
4. If chromosomes are the "books" of heredity, the "words" that make each of us a distinctive human being are called _____ .
5. The complete instructions for making an organism are referred to as the human _____ . Human traits are influenced by many genes acting together in _____ _____ .

Objective 4: Explain how identical and fraternal twins differ, and cite ways that behavior geneticists use twin studies to understand the effects of environment and heredity.

6. To study the power and limits of genetic influences on behavior, researchers use _____ and _____ studies.
7. Twins who developed from a single egg are genetically _____ . Twins who developed from different fertilized eggs are no more genetically alike than siblings and are called _____ twins. In terms of the personality traits of extraversion and neuroticism, identical twins are _____ (more/no more) alike than are fraternal twins.
8. Divorce rates are _____ (more/no more) similar among identical twins than among fraternal twins. Identify other dimensions that show strong genetic influences.
9. Through research on identical twins raised apart, psychologists are able to study the influence of the _____ .

Objective 5: Cite ways that behavior geneticists use adoption studies to understand the effects of environment and heredity.

10. Studies tend to show that the personalities of adopted children _____ (do/do not) closely resemble those of their adoptive parents.
11. Adoption studies show that parenting _____ (does/does not) matter. For example, adopted children often score _____ (higher/lower) than their biological parents on intelligence tests.

Objective 6: Discuss how the relative stability of our temperament illustrates the influence of heredity on development

12. The term that refers to the inborn personality, especially the child's emotional excitability, is _____ , which _____ (does/does not) endure over time.
13. From the first weeks of life, _____ babies are more _____ , _____ , and _____ . In contrast, _____ babies are _____ , _____ , and _____ .
14. Faced with a new or strange situation, high-strung infants become _____ (more/less) physiologically aroused than less excitable infants.

Objective 7: Discuss heritability's application to individuals and groups, and explain what we mean when we say genes are self-regulating.

15. The proportion of variation in a trait within a group that is attributable to genes is called its _____ .

16. As environments become more similar, heredity as a source of differences becomes _____ (more/less) important.

17. Heritable individual differences _____ (imply/need not imply) heritable group differences.

18. For _____ phenomena, human differences are nearly always the result of both _____ and _____ influences.

Objective 8: Give an example of a genetically influenced trait that can evoke responses in others, and give another example of an environment that can trigger gene activity.

19. Throughout life, we are the product of the _____ of our _____ predispositions and our surrounding _____ .

20. Environments trigger activity in_____ , and our genetically influenced traits evoke _____ in other people. This may explain why _____ twins recall greater variations in their early family life than do _____ twins.

Objective 9: Identify the potential promise and perils of molecular genetics research.

21. The subfield of biology that investigates the specific genes that influence behavior is _____ _____ .

22. Genetic tests can reveal at-risk populations for specific _____ .

23. One result of research in this field, genetic screening, allows expectant parents to ascertain, and even choose, the _____ of their offspring. Prenatal screening, however, raises many _____ issues.

Evolutionary Psychology: Understanding Human Nature (pp. 107–113)

If you do not know the meaning of the following words, phrases, or expressions in the context in which they appear in the text, refer to pages 94–95 for an explanation: *cash strapped; tight genetic leash; Casual, impulsive sex; sexual come-on; In our ancestral history, females most often sent their genes into the future by pairing wisely, men by pairing widely; stick-around dads over likely cads; mobile gene machines.*

Objective 10: Describe the area of psychology that interests evolutionary psychologists.

1. Researchers who study natural selection and the adaptive nature of human behavior are called _____ _____ .

2. Researchers in this field focus mostly on what makes people so _____ (much alike/different from one another).

Objective 11: State the principle of natural selection, and point out some possible effects of natural selection in the development of human characteristics.

3. According to the principle of _____ _____ , traits that contribute to reproduction and survival will be most likely to be passed on to succeeding generations.

4. Genetic _____ are random errors in genetic replication that are the source of all genetic _____ .

5. Genetic constraints on human behavior are generally _____ (tighter/looser) than those on animal behavior. The human species' ability to _____ and to _____ in responding to different _____ contributes to our _____ , defined as our ability to _____ and _____ . Because of our genetic legacy, we love the tastes of sweets and _____ , which we tend to _____ , even though famine is unlikely in industrialized societies.

Objective 12: Identify some gender differences in sexuality.

6. The characteristics by which people define *male* and *female* constitute _____ . These characteristics are subject to _____ and _____ influences.
7. Compared to females, males are _____ (equally/more/less) likely to engage in casual, impulsive sex, and they are _____ (equally/more/less) likely to initiate sexual activity. This is an example of a _____ difference.
8. Men have a _____ (higher/lower) threshold for perceiving a woman's friendliness as a sexual come-on. This helps explain men's greater sexual _____ .

Objective 13: Describe evolutionary explanations for gender differences in sexuality.

9. The _____ explanation of gender differences in attitudes toward sex is based on differences in the optimal strategy by which women and men pass on their _____ . According to this view, males and females _____ (are/are not) selected for different patterns of sexuality.
10. Cross-cultural research reveals that men judge women as more attractive if they have a _____ appearance, whereas women judge men who appear _____ , _____ , _____ , and _____ as more attractive.

Objective 14: Summarize the criticisms of evolutionary explanations of human behaviors, and describe the evolutionary psychologists' responses to these criticisms.

11. Critics of the evolutionary explanation of the gender sexuality difference argue that it often works _____ (forward/backward) to propose a _____ explanation.
12. Another critique is that gender differences in sexuality vary with _____ expectations and social and family structures.
13. Gender differences in mate preferences are largest in cultures characterized by greater gender _____ (equality/inequality).
14. Evolutionary psychologists counter the criticisms by noting that the sexes, having faced similar adaptive problems, are more _____ (alike/different) than they are _____ (alike/different). They also note that evolutionary principles offer testable _____ .

Parents and Peers (pp. 114–118)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to page 95 for an explanation: *while the excess connections are still on call; pathways through a forest; shuffle their gene decks; as a potter molds clay; vapors of a toxic climate are seeping into a child's life.*

Objective 15: Describe some of the conditions that can affect development before birth.

1. Environmental influences begin during the period of _____ development.
2. Even identical twins may differ in this respect, because they may or may not share the same _____ .
3. Compared with same-placenta identical twins, twins who develop with different placentas are less similar in their _____ traits.

Objective 16: Describe how experience can modify the brain.

4. Rosenzweig and Krech discovered that rats raised from a young age in enriched environments had _____ (thicker/thinner) cortexes than animals raised in isolation.

Describe the effects of sensory stimulation on neural development.

5. Experience shapes the brain by preserving activated _____ connections and allowing unused connections to _____ . This process, called _____ , results in a massive loss of unused connections by _____ .

Objective 17: Explain why we should be careful about attributing children's successes and failures to their parents' influence.

6. The idea that parents shape their children's futures came from _____ _____ and _____ .
7. Parents do influence some areas of their children's lives, such as their _____ _____ , _____ _____ , and _____ _____ .
8. In areas such as _____ , the environment siblings share at home accounts for less than _____ percent of their differences.

Objective 18: Evaluate the importance of peer influence on development.

9. Experiences with _____ have a powerful effect on how children develop, partly as a result of a "_____ effect" by which kids seek out others with similar attitudes and interests.
10. A group of parents can influence the _____ that shapes the peer group through what Judith Harris calls _____ effects.

Cultural Influences (pp. 119–126)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to pages 95–96 for an explanation: *cerebral hard drive . . . cultural software; norms grease the social machinery; cultures collide; standoffish.*

Objective 19: Discuss the survival benefits of culture.

1. The enduring behaviors, ideas, attitudes, and traditions of a group of people and transmitted from one generation to the next defines the group's _____ .
2. One landmark of human culture is the preservation of _____ , which is derived from our mastery of _____ , so that we can pass it on to future generations.

Objective 20: Describe some ways that cultures differ.

3. All cultural groups evolve their own rules for expected behavior, called _____ .
4. One such rule involves the buffer zone that people maintain around their bodies, called _____ _____ .

Identify several cultural differences in personal space, expressiveness, and pace of life.

Objective 21: Explain why changes in the human gene pool cannot account for culture change over time.

5. Cultures change _____ (slowly/rapidly).
6. Many changes in Western culture have been driven by the discovery of new forms of _____ .
7. The speed at which culture changes is much _____ (faster/slower) than the pace of evolutionary changes in the human _____ _____ .

Objective 22: Identify some ways a primarily individualist culture differs from a primarily collectivist culture, and compare their effects on personal identity.

8. Cultures based on _____ value personal _____ and individual _____ . Examples of such cultures occur in the _____ _____ ,

_____ , and _____ _____ .

9. In contrast, cultures based on _____ value _____ , _____ , and _____ . Examples of such cultures occur in parts of _____ and _____ .

10. Whereas people in _____ cultures value freedom, they suffer more _____ , divorce, and _____ -related disease.

Objective 23: Describe some ways that child-rearing differs in individualist and collectivist cultures.

11. Whereas most Western parents place more emphasis on _____ (emotional closeness/independence) in their children, many Asian and African parents focus on cultivating _____ (emotional closeness/independence).

12. Children in collectivist cultures grow up with a strong sense of _____ _____ .

Objective 24: Describe some ways that humans are similar, despite their cultural differences.

13. In general, differences between groups are _____ (smaller/larger) than person-to-person differences within groups.

Gender Development (pp. 126–134)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to page 96 for an explanation: *surface early; throws a master switch; "tomboyish"; initiate dates . . . pick up the check; With the flick of an apron.*

Objective 25: Identify some biological and psychological differences between males and females.

1. Among your _____ (how many?) chromosomes, _____ (how many?) are unisex.

2. Compared to the average man, an average woman has more _____ , less _____ , and is a few inches _____ . Women are more likely than men to suffer from _____ , _____ , and _____ _____ .

3. Compared to women, men are more likely to commit _____ and to suffer _____ . They are also more likely to be diagnosed with _____ , _____-_____ , _____ , and _____ _____ _____ .

Objective 26: Summarize the gender gap in aggression.

4. Aggression is defined as _____ or _____ behavior that is _____ to hurt someone.

5. Throughout the world, men are more likely than women to engage in _____ , _____ , and _____ .

6. The aggression gender gap pertains to _____ rather than _____ aggression.

Objective 27: Describe some gender differences in social power.

7. Compared to women, men are perceived as being more _____ , _____ , and _____ . As leaders, they tend to be more _____ , while women are more _____ .

8. Compared to men, women are perceived as being more _____ , _____ , and _____ .

9. These perceived differences occur _____ (throughout the world/only in certain cultures).

Objective 28: Discuss gender differences in connectedness, or the ability to "tend and befriend."

10. According to Carol Gilligan, women are more concerned than men in making _____ with others.

11. This difference is noticeable in how children _____ , and it continues throughout the teen and adult years. Girls play in groups that are _____ and less _____ than boys' groups.

12. Because they are more _____ , women are likely to use conversation to _____ _____ , while men are likely to use conversation to _____ _____ .

13. Women tend and befriend—for example, they turn to others for _____ , especially when coping with _____ .

Objective 29: Explain how biological sex is determined, and describe the role of sex hormones in biological development and gender differences.

14. The twenty-third pair of chromosomes determines the developing person's _____ . The mother always contributes a(n) _____ chromosome. When the father contributes a(n) _____ chromosome, the testes begin producing the hormone _____ . In about the _____ (what week?), this hormone initiates the development of external male sex organs.

15. Genetically female infants who were exposed to excess testosterone during prenatal development develop _____-appearing genitals. Behaviorally, until adolescence, they tend to act in more aggressive "_____ " ways than do most girls.

16. Sex chromosomes control _____ that influence the brain's wiring. In adulthood, part of the _____ lobe , an area involved in _____ fluency, is thicker in women. Part of the brain's _____ lobe, a key area for _____ perception, is thicker in men.

Objective 30: Discuss the relative importance of environment on the development of gender roles, and describe two theories of gender typing.

17. Our expectations about the way men and women behave define our culture's _____ _____ .

18. Gender roles _____ (are/are not) rigidly fixed by evolution, as evidenced by the fact that they vary across _____ and over _____ . For instance, in _____ societies there tends to be minimal division of labor by sex; by contrast, in _____ societies, women remain close to home while men roam freely, herding cattle or sheep.

19. Our individual sense of being male or female is called our _____ _____ . The degree to which we exhibit traditionally male or female traits and interests is called _____- _____ .

20. According to _____ _____ theory, children learn gender-linked behaviors by observing others and being rewarded or punished. When their families discourage traditional gender-typing, children _____ (do/do not) organize themselves into "boy worlds" and "girl worlds."

21. Another theory, called _____ _____ theory, combines _____ _____ theory with _____ . According to this theory, children learn from their _____ what it means to be male or female and adjust their behavior accordingly.

Reflections on Nature and Nurture (pp. 134–137)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to page 105 for an explanation: *won the day; boggles the mind.*

Objective 31: Describe the biopsychosocial approach to development.

1. As _____ _____ becomes more and more irrelevant to power and status, gender roles are _____ (converging/diverging).
2. We are the product of both _____ and _____ , but we are also a system that is _____ .
3. The principle that we should prefer the simplest of competing explanations for a phenomenon is called _____ _____ .

PROGRESS TEST 1

Multiple-Choice Questions

Circle your answers to the following questions and check them with the answers beginning on page 89. If your answer is incorrect, read the explanation for why it is incorrect and then consult the appropriate pages of the text (in parentheses following the correct answer).

1. Dr. Ross believes that principles of natural selection help explain why infants come to fear strangers about the time they become mobile. Dr. Ross is most likely a(n):
   a. behavior geneticist.
   b. molecular geneticist.
   c. evolutionary psychologist.
   d. molecular biologist.

2. A pair of adopted children or identical twins reared in the same home are most likely to have similar:
   a. temperaments.
   b. personalities.
   c. religious beliefs.
   d. emotional reactivity.

3. Collectivist cultures:
   a. give priority to the goals of their groups.
   b. value the maintenance of social harmony.
   c. foster social interdependence.
   d. are characterized by all of the above.

4. If a fraternal twin becomes schizophrenic, the likelihood of the other twin developing serious mental illness is much lower than with identical twins. This suggests that:
   a. schizophrenia is caused by genes.
   b. schizophrenia is influenced by genes.
   c. environment is unimportant in the development of schizophrenia.
   d. identical twins are especially vulnerable to mental disorders.

5. Of the following, the best way to separate the effects of genes and environment in research is to study:
   a. fraternal twins.
   b. identical twins.
   c. adopted children and their adoptive parents.
   d. identical twins raised in different environments.

6. Through natural selection, the traits that are most likely to be passed on to succeeding generations are those that contribute to:
   a. reproduction.
   b. survival.
   c. aggressiveness.
   d. a. and b.

7. Which of the following is *not* true regarding gender and sexuality?
   a. Men more often than women attribute a woman's friendliness to sexual interest.
   b. Women are more likely than men to cite affection as a reason for first intercourse.
   c. Men are more likely than females to initiate sexual activity.
   d. Gender differences in sexuality are noticeably absent among gay men and lesbian women.

8. Evolutionary psychologists attribute gender differences in sexuality to the fact that women have:
   a. greater reproductive potential than do men.
   b. lower reproductive potential than do men.
   c. weaker sex drives than men.
   d. stronger sex drives than men.

9. According to evolutionary psychology, men are drawn sexually to women who seem _____ , while women are attracted to men who seem _____ .
   a. nurturing; youthful
   b. youthful and fertile; mature and affluent
   c. slender; muscular
   d. exciting; dominant

10. Unlike _____ twins, who develop from a single fertilized egg, _____ twins develop from separate fertilized eggs.
    a. fraternal; identical
    b. identical; fraternal
    c. placental; nonplacental
    d. nonplacental; placental

11. Temperament refers to a person's characteristic:
- **a.** emotional reactivity and intensity.
- **b.** attitudes.
- **c.** behaviors.
- **d.** role-related traits.

12. When evolutionary psychologists use the word "fitness," they are specifically referring to:
- **a.** an animal's ability to adapt to changing environments.
- **b.** the diversity of a species' gene pool.
- **c.** the total number of members of the species currently alive.
- **d.** our ability to survive and reproduce.

13. In a hypothetical world where all schools are of uniform quality, all families equally loving, and all neighborhoods equally healthy, the heritability of person-to-person differences would be:
- **a.** large.
- **b.** small.
- **c.** zero.
- **d.** unpredictable.

14. The subfield that studies the specific genes that influence behavior is:
- **a.** behavior genetics.
- **b.** molecular genetics.
- **c.** evolutionary psychology.
- **d.** biopsychosocial genetics.

15. Which of the following most accurately expresses the extent of parental influence on personality?
- **a.** It is more extensive than most people believe.
- **b.** It is weaker today than in the past.
- **c.** It is more limited than popular psychology supposes.
- **d.** It is almost completely unpredictable.

16. Gender refers to:
- **a.** the biological and social definition of male and female.
- **b.** the biological definition of male and female.
- **c.** one's sense of being male or female.
- **d.** the extent to which one exhibits traditionally male or female traits.

17. The fertilized egg will develop into a boy if, at conception:
- **a.** the sperm contributes an X chromosome.
- **b.** the sperm contributes a Y chromosome.
- **c.** the egg contributes an X chromosome.
- **d.** the egg contributes a Y chromosome.

18. Which theory states that gender becomes a lens through which children view their experiences?
- **a.** social learning theory
- **b.** sociocultural theory
- **c.** cognitive theory
- **d.** gender schema theory

19. The hormone testosterone:
- **a.** is found only in females.
- **b.** determines the sex of the developing person.
- **c.** stimulates growth of the female sex organs.
- **d.** stimulates growth of the male sex organs.

20. Research studies have found that when infant rats and premature human babies are regularly touched or massaged, they:
- **a.** gain weight more rapidly.
- **b.** develop faster neurologically.
- **c.** have more agreeable temperaments.
- **d.** do a. and b.

Matching Items

Match each term with its corresponding definition or description.

Terms

_____ **1.** X chromosome
_____ **2.** heritability
_____ **3.** fraternal
_____ **4.** genes
_____ **5.** DNA
_____ **6.** identical
_____ **7.** Y chromosome
_____ **8.** gender role
_____ **9.** gender identity
_____ **10.** gender-typing
_____ **11.** environment

Functions or Descriptions

- **a.** the biochemical units of heredity
- **b.** twins that develop from a single egg
- **c.** one's personal sense of being female or male
- **d.** a set of expected behaviors for males and females
- **e.** twins that develop from separate eggs
- **f.** variation among individuals due to genes
- **g.** nongenetic influences
- **h.** the sex chromosome found in both women and men
- **i.** the acquisition of a traditional gender role
- **j.** a complex molecule containing the genetic information that makes up the chromosomes
- **k.** the sex chromosome found only in men

PROGRESS TEST 2

Progress Test 2 should be completed during a final chapter review. Answer the following questions after you thoroughly understand the correct answers for the section reviews and Progress Test 1.

Multiple-Choice Questions

1. Each cell of the human body has a total of:
   a. 23 chromosomes.
   b. 23 genes.
   c. 46 chromosomes.
   d. 46 genes.

2. Genes direct our physical development by synthesizing:
   a. hormones.
   b. proteins.
   c. DNA.
   d. chromosomes.

3. The human genome is best defined as:
   a. a complex molecule containing genetic information that makes up the chromosomes.
   b. a segment of DNA.
   c. the complete instructions for making an organism.
   d. the code for synthesizing protein.

4. Most human traits are:
   a. learned.
   b. determined by a single gene.
   c. influenced by many genes acting together.
   d. unpredictable.

5. Mutations are random errors in _____ replication.
   a. gene
   b. chromosome
   c. DNA
   d. protein

6. Casual, impulsive sex is most frequent among:
   a. males with high circulating levels of testosterone.
   b. males with traditional masculine attitudes.
   c. females and males who are weakly gender-typed.
   d. females and males who are strongly gender-typed.

7. Evolutionary explanations of gender differences in sexuality have been criticized because:
   a. they offer "after-the-fact" explanations.
   b. standards of attractiveness vary with time and place.
   c. they underestimate cultural influences on sexuality.
   d. of all of the above reasons.

8. Several studies of long-separated identical twins have found that these twins:
   a. have little in common, due to the different environments in which they were raised.
   b. have many similarities, in everything from medical histories to personalities.
   c. have similar personalities, but very different likes, dislikes, and life-styles.
   d. are no more similar than are fraternal twins reared apart.

9. Adoption studies show that the personalities of adopted children:
   a. closely match those of their adoptive parents.
   b. bear more similarities to their biological parents than to their adoptive parents.
   c. closely match those of the biological children of their adoptive parents.
   d. closely match those of other children reared in the same home, whether or not they are biologically related.

10. Of the following, parents are most likely to influence their children's:
    a. temperament.
    b. personality.
    c. faith.
    d. emotional reactivity.

11. Chromosomes are composed of small segments of
    a. DNA called genes.
    b. DNA called neurotransmitters.
    c. genes called DNA.
    d. DNA called enzymes.

12. When the effect of one factor (such as environment) depends on another (such as heredity), we say there is a(n) _____ between the two factors.
    a. norm
    b. positive correlation
    c. negative correlation
    d. interaction

13. Compared to children raised in Western societies, those raised in communal societies, such as Japan or China:
- **a.** grow up with a stronger integration of the sense of family into their self-concepts.
- **b.** exhibit greater shyness toward strangers.
- **c.** exhibit greater concern for loyalty and social harmony.
- **d.** have all of the above characteristics.

14. The *selection effect* in peer influence refers to the tendency of children and youth to:
- **a.** naturally separate into same-sex playgroups.
- **b.** establish large, fluid circles of friends.
- **c.** seek out friends with similar interests and attitudes.
- **d.** choose friends their parents like.

15. Which of the following is *not* true regarding cultural diversity?
- **a.** Culture influences emotional expressiveness.
- **b.** Culture influences personal space.
- **c.** Culture does not have a strong influence on how strictly social roles are defined.
- **d.** All cultures evolve their own norms.

16. Women and men are most likely to be attracted to strongly gender-typed mates in cultures characterized by:
- **a.** gender inequality.
- **b.** gender equality.
- **c.** flexible gender roles.
- **d.** few norms.

17. An evolutionary psychologist would be most interested in studying:
- **a.** why most parents are so passionately devoted to their children.
- **b.** hereditary influences on skin color.
- **c.** why certain diseases are more common among certain age groups.
- **d.** genetic differences in personality.

18. Children who are raised by parents who discourage traditional gender-typing:
- **a.** are less likely to display gender-typed behaviors themselves.
- **b.** often become confused and develop an ambiguous gender identity.
- **c.** nevertheless organize themselves into "girl worlds" and "boy worlds."
- **d.** display excessively masculine and feminine traits as adults.

19. Genetically female children often play in "masculine" ways if they were exposed to excess _____ during prenatal development.
- **a.** estrogen
- **b.** DNA
- **c.** testosterone
- **d.** oxygen

20. Providing a child with a stimulating educational environment during early childhood is likely to:
- **a.** ensure the formation of a strong attachment with parents.
- **b.** foster the development of a calm, easygoing temperament.
- **c.** prevent neural connections from degenerating.
- **d.** do all of the above.

True–False Items

Indicate whether each statement is true or false by placing *T* or *F* in the blank next to the item.

_____ **1.** Gender differences in mate preferences vary widely from one culture to another.

_____ **2.** The most emotionally reactive newborns tend to be the most restrained 9-month-olds.

_____ **3.** Research on twins shows a substantial genetic influence on attitudes toward organized religion and many other issues.

_____ **4.** As environments become less similar, heredity as a source of differences becomes more important.

_____ **5.** Compared to identical twins reared in different families, fraternal twins recall their early family life more differently.

_____ **6.** Parents have a stronger influence than do peers on whether a youth starts smoking.

_____ **7.** Nature selects behavior tendencies that increase the likelihood of sending one's genes into the future.

_____ **8.** People from individualist cultures say what they feel and what they presume others feel.

_____ **9.** Parental influence on personality is more limited than popular psychology supposes.

_____ **10.** North Americans prefer more personal space than do Latin Americans.

_____ **11.** Lacking any exposure to language before adolescence, a person will never master any language.

PSYCHOLOGY APPLIED

Answer these questions the day before an exam as a final check on your understanding of the chapter's terms and concepts.

Multiple-Choice Questions

1. If chromosomes are the "books" of heredity, the "words" are the _____ .

a. genes
b. molecules
c. genomes
d. DNA

2. To say that the heritability of a trait is approximately 50 percent means that:

a. genes are responsible for 50 percent of the trait in an individual, and the environment is responsible for the rest.
b. the trait's appearance in a person will reflect approximately equal genetic contributions from both parents.
c. of the variation in the trait within a group of people, 50 percent can be attributed to genes.
d. all of the above are correct.

3. After comparing divorce rates among identical and fraternal twins, Dr. Alexander has concluded that genes do play a role. Dr. Alexander is most likely a(n):

a. evolutionary psychologist.
b. behavior geneticist.
c. molecular geneticist.
d. divorcee.

4. Despite growing up in the same home environment, Karen and her brother John have personalities as different from each other as two people selected randomly from the population. Why is this so?

a. Personality is inherited. Because Karen and John are not identical twins, it is not surprising they have very different personalities.
b. Gender is the most important factor in personality. If Karen had a sister, the two of them would probably be much more alike.
c. The interaction of their individual genes and nonshared experiences accounts for the common finding that children in the same family are usually very different.
d. Their case is unusual; children in the same family usually have similar personalities.

5. I am a rat whose cortex is lighter and thinner than my litter mates. What happened to me?

a. You were born prematurely.
b. You suffer from fetal alcohol syndrome.
c. You were raised in an enriched environment.
d. You were raised in a deprived environment.

6. Chad, who grew up in the United States, is more likely to encourage _____ in his future children than Asian-born Hidiyaki, who is more likely to encourage _____ in his future children.

a. obedience; independence
b. independence; emotional closeness
c. emotional closeness; obedience
d. loyalty; emotional closeness

7. One of the best ways to distinguish how much genetic and environmental factors affect behavior is to compare children who have:

a. the same genes and environments.
b. different genes and environments.
c. similar genes and environments.
d. the same genes but different environments.

8. My sibling and I developed from a single fertilized egg. Who are we?

a. opposite-sex identical twins.
b. same-sex identical twins.
c. opposite-sex fraternal twins.
d. same-sex fraternal twins.

9. A psychologist working from the evolutionary perspective is likely to suggest that people are biologically predisposed to:

a. protect their offspring.
b. fear heights.
c. be attracted to fertile-appearing members of the opposite sex.
d. do all of the above.

10. The heritability of a trait will be largest among genetically _____ individuals who grew up in _____ environments.

a. dissimilar; dissimilar
b. dissimilar; similar
c. similar; similar
d. similar; dissimilar

11. Compared with men, women:
- **a.** use conversation to communicate solutions.
- **b.** emphasize freedom and self-reliance.
- **c.** talk more openly.
- **d.** do all of the above.

12. Of the relatively few genetic differences among humans _____ are differences among population groups.
- **a.** less than 1 percent
- **b.** less than 10 percent
- **c.** approximately 25 percent
- **d.** approximately 40 to 50 percent

13. Responding to the argument that gender differences are often by-products of a culture's social and family structures, an evolutionary psychologist is most likely to point to:
- **a.** our great human capacity for learning.
- **b.** the tendency of cultural arguments to reinforce traditional gender inequalities.
- **c.** the infallibility of "hindsight" explanations.
- **d.** all of the above.

14. A person whose twin has Alzheimer's disease has _____ risk of sharing the disease if they are identical twins than if they are fraternal twins.
- **a.** less
- **b.** about the same
- **c.** much greater
- **d.** It is unpredictable.

15. Which of the following is an example of an interaction?
- **a.** Swimmers swim fastest during competition against other swimmers.
- **b.** Swimmers with certain personality traits swim fastest during competition, while those with other personality traits swim fastest during solo time trials.
- **c.** As the average daily temperature increases, sales of ice cream decrease.
- **d.** As the average daily temperature increases, sales of lemonade increase.

16. Which of the following most accurately summarizes the findings of the 40-year fox-breeding study described in the text?
- **a.** Wild wolves cannot be domesticated.
- **b.** "Survival of the fittest" seems to operate only when animals live in their natural habitats.
- **c.** By mating aggressive and unaggressive foxes, the researchers created a mutant species.
- **d.** By selecting and mating the tamest males and females, the researchers have produced affectionate, unaggressive offspring.

17. Compared to men, women are more likely to:
- **a.** be concerned with their partner's physical attractiveness.
- **b.** initiate sexual activity.
- **c.** cite "liking one another" as a justification for having sex in a new relationship.
- **d.** be less accepting of casual sex.

18. When his son cries because another child has taken his favorite toy, Brandon admonishes him by saying, "Big boys don't cry." Evidently, Brandon is an advocate of _____ in accounting for the development of gender-linked behaviors.
- **a.** gender schema theory
- **b.** gender identity theory
- **c.** gender-typing theory
- **d.** social learning theory

19. The fact that after age 2, language forces children to begin organizing their worlds on the basis of gender is most consistent with which theory of how gender-linked behaviors develop?
- **a.** gender schema theory
- **b.** gender identity theory
- **c.** gender-typing theory
- **d.** social learning theory

20. Three-year-old Jack is inhibited and shy. As an adult, Jack is likely to be:
- **a.** cautious and unassertive.
- **b.** spontaneous and fearless.
- **c.** socially assertive.
- **d.** Who knows? This aspect of personality is not very stable over the life span.

Essay Question

Lakia's new boyfriend has been pressuring her to become more sexually intimate than she wants to at this early stage in their relationship. Strongly gender-typed and "macho" in attitude, Jerome is becoming increasingly frustrated with Lakia's hesitation, while Lakia is starting to wonder if a long-term relationship with this type of man is what she really wants. In light of your understanding of the evolutionary explanation of gender differences in sexuality, explain why the tension between Lakia and Jerome would be considered understandable.

KEY TERMS

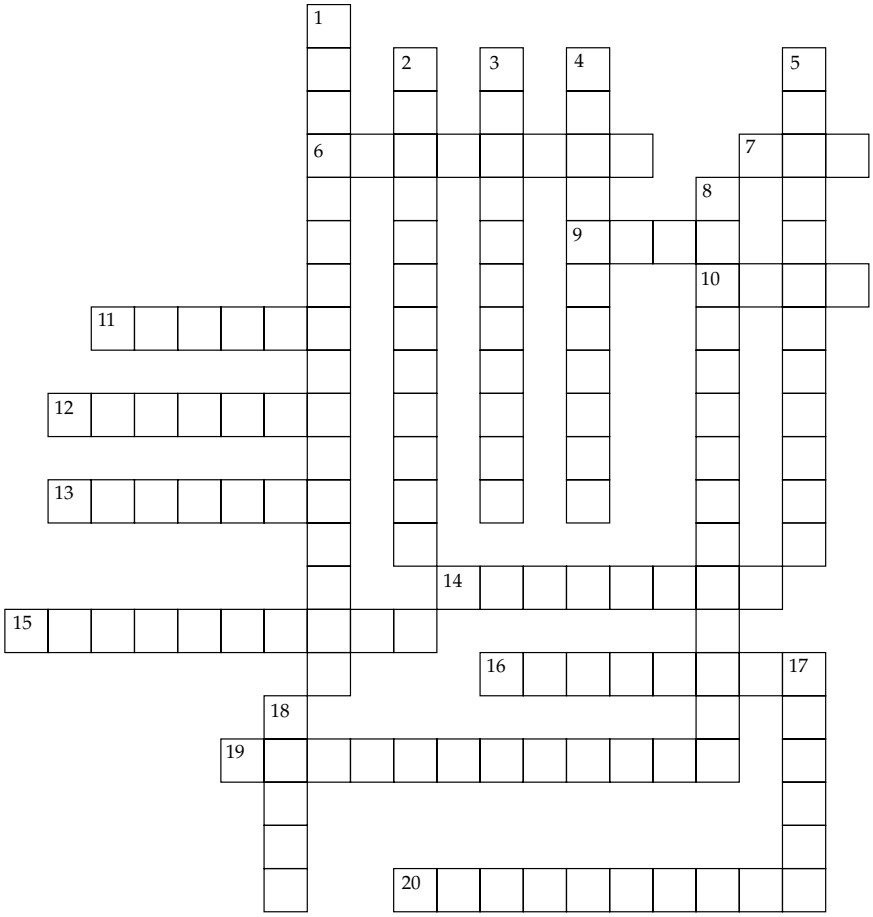
Writing Definitions

Using your own words, on a piece of paper write a brief definition or explanation of each of the following terms.

1. environment
2. behavior genetics
3. chromosomes
4. DNA
5. genes
6. genome
7. identical twins
8. fraternal twins
9. temperament
10. heritability
11. interaction
12. molecular genetics
13. evolutionary psychology
14. natural selection
15. mutation
16. gender
17. culture
18. norm
19. personal space
20. individualism
21. collectivism
22. aggression
23. X chromosome
24. Y chromosome
25. testosterone
26. role
27. gender role
28. gender identity
29. gender-typing
30. social learning theory
31. gender schema theory

Cross-Check

As you learned in the Prologue, reviewing and overlearning of material are important to the learning process. After you have written the definitions of the key terms in this chapter, you should complete the crossword puzzle to ensure that you can reverse the process—recognize the term, given the definition.



ACROSS

6. Parents whose personalities bear little relevance to their children's personalities.
7. Complex molecule containing the genetic information that makes up the chromosomes.
9. Set of expected behaviors for those who occupy a particular social position.
10. An understood rule for expected and accepted behavior.
11. The biological and social characteristics by which people define male and female.
12. The enduring behaviors, ideas, attitudes, and traditions shared by a large group of people.
13. Environmental influences on behavior.
14. According to the evolutionary perspective, women are drawn to healthy-looking men who are also _____ .
15. Behavior geneticists often compare the traits of adopted children to those of their _____ parents.
16. Source of all genetic diversity.
19. The proportion of variation among individuals that can be attributed to genes.
20. Threadlike structure made up largely of DNA molecules.

DOWN

1. The study of the relative power and limits of genetic and environmental influences on behavior.
2. Subfield of psychology that uses principles of natural selection to explore human traits and behaviors.
3. When the effect of one factor depends on another factor.
4. Any nongenetic influence.
5. A lens through which children organize their understanding of being male or female.
8. One's personal sense of being female or male.
17. Another word for heredity.
18. Segments of DNA capable of synthesizing proteins.

ANSWERS

Chapter Review

Introduction

1. personalities; interests; cultural; family
2. biological heritage; brain; language; social
3. nature; nurture

Behavior Genetics: Predicting Individual Differences

1. behavior geneticists
2. nongenetic
3. chromosomes; 46; 23; DNA
4. genes
5. genome; gene complexes
6. twin; adoption
7. identical; fraternal; more
8. more

Other dimensions that reflect genetic influences are abilities, personal traits, and interests.

9. environment
10. do not
11. does; higher
12. temperament; does
13. difficult; irritable; intense; unpredictable; easy; cheerful; relaxed; predictable in feeding and sleeping
14. more
15. heritability
16. more
17. need not imply
18. psychological; genetic; environmental
19. interaction; genetic; environment
20. genes; responses; fraternal; identical
21. molecular genetics
22. diseases
23. sex; ethical

Evolutionary Psychology: Understanding Human Nature

1. evolutionary psychologists
2. much alike
3. natural selection
4. mutations; diversity
5. looser; learn; adapt; environments; fitness; survive; reproduce; fat; store
6. gender; biological; social
7. more; more; gender
8. lower; assertiveness
9. evolutionary; genes; are
10. youthful; mature; dominant; bold; affluent
11. backward; hindsight
12. cultural
13. inequality
14. alike; different; predictions

Parents and Peers

1. prenatal
2. placenta
3. psychological
4. thicker

Research has shown that human and animal infants given extra sensory stimulation develop faster neurologically. Throughout life, sensory stimulation activates and strengthens particular neural connections, while other connections weaken with disuse. In this way, our experiences shape the very structure of the neural pathways that process those experiences.

5. neural; degenerate; pruning; puberty
6. Freudian psychiatry; psychology
7. political attitudes; personal manners; religious beliefs
8. personality; 10
9. peers; selection
10. culture; parents'-group-to-children's-group

Cultural Influences

1. culture
2. innovation; language
3. norms
4. personal space

Most North Americans, the British, and Scandinavians prefer more personal space than do Latin Americans, Arabs, and the French. Cultural differences in expressiveness and the pace of life often create misunderstandings. For example, people with northern European roots may perceive people from Mediterranean cultures as warm and charming but inefficient, while Mediterraneans may see the northern Europeans as efficient but emotionally cold.

5. slowly
6. technology
7. faster; gene pool
8. individualism; independence (or control); achievement; United States; Canada; Western Europe
9. collectivism; interdependence; tradition; harmony; Africa; Asia
10. individualist; loneliness; stress
11. independence; emotional closeness
12. family self
13. smaller

Gender Development

1. 46; 45
2. fat; muscle; shorter; depression; anxiety; eating disorders
3. suicide; alcoholism; autism, color-blindness, hyperactivity, antisocial personality disorder
4. physical; verbal; intended
5. hunting; fighting; warring

6. physical; verbal
7. dominant; forceful; independent; directive (or autocratic); democratic
8. deferential; nurturant; affiliative
9. throughout the world
10. connections
11. play; smaller; competitive
12. interdependent; explore relationships; communicate solutions
13. support; stress
14. sex; X; Y; testosterone; seventh
15. male; tomboyish
16. hormones; frontal; verbal; parietal; space
17. gender roles
18. are not; cultures; time; nomadic; agricultural
19. gender identity; gender-typing
20. social learning; do
21. gender schema; social learning; cognition; schemas

Reflections on Nature and Nurture

1. brute strength; converging
2. nature; nurture; open
3. Occam's razor

Progress Test 1

Multiple-Choice Questions

1. **c.** is the answer. (p. 108)
   a., b., & d. Whereas evolutionary psychologists attempt to explain universal human tendencies, these researchers investigate genetic differences among individuals.
2. **c.** is the answer. Research has not shown a strong parental influence on personality, temperament, or emotional reactivity. (p. 101)
3. **d.** is the answer. (p. 122)
4. **b.** is the answer. (p. 98)
   a. & c. Although an identical twin is at increased risk, the relationship is far from perfect. Mental disorders, like all psychological traits, are influenced by *both* nature and nurture.
   d. This is not at all implied by the evidence from twin studies.
5. **d.** is the answer. (p. 99)
   a., b., & c. In order to pinpoint the influence of one of the two factors (genes and environment), it is necessary to hold one of the factors constant.
6. **d.** is the answer. (p. 108)
   c. Natural selection favors traits that send one's genes into the future, such as surviving longer and reproducing more often. Aggression does not necessarily promote either.
7. **d.** is the answer. Such gender differences characterize both heterosexual and homosexual people. (p. 110)
8. **b.** is the answer. Women can incubate only one infant at a time. (p. 111)
   c. & d. The text does not suggest that there is a gender difference in the strength of the sex drive.
9. **b.** is the answer. (p. 111)
   a. According to this perspective, women prefer mates with the potential for long-term nurturing investment in their joint offspring.
   c. While men are drawn to women whose waists are roughly a third narrower than their hips, the text does not suggest that women equate muscularity with fertility.
   d. Excitement was not mentioned as a criterion for mating.
10. **b.** is the answer. (pp. 97–98)
    c. & d. There are no such things as "placental" or "nonplacental" twins. All twins have a placenta during prenatal development.
11. **a.** is the answer. (p. 102)
12. **d.** is the answer. (p. 109)
    a. Survival ability is only one aspect of fitness.
    b. & c. Neither of these is related to fitness.
13. **a.** is the answer. (pp. 102–103)
    b., c., & d. This hypothetical world is one in which there is no environmental variation. Therefore, any individual differences are predictably due to genes.
14. **b.** is the answer. (p. 105)
    a. Behavior geneticists use twin and adoption studies to explore the relative power and limits of nature and nurture on behavior.
    c. Evolutionary psychologists study how natural selection favored behavioral tendencies that contributed to the survival and spread of our ancestors' genes.
    d. Although this sounds intriguing, there is no such field.
15. **c.** is the answer. (pp. 116–117)
16. **a.** is the answer. (p. 110)
    c. This defines gender identity.
    d. This defines gender-typing.
17. **b.** is the answer. (p. 129)
    a. In this case, a female would develop.

c. & d. The egg can contribute only an X chromosome. Thus, the sex of the child is determined by which chromosome the sperm contributes.

18. d. is the answer. (p. 132)
a. According to social learning theory, gender-typing evolves through imitation and reinforcement.
b. & c. Neither theory focuses on gender-typing.

19. d. is the answer. (p. 130)
a. Although testosterone is the principal male hormone, it is present in both females and males.
b. This is determined by the sex chromosomes.
c. In the absence of testosterone, female sex organs will develop.

20. d. is the answer. (p. 115)

Matching Items

1. h (p. 129) **2.** f (p. 102) **3.** e (p. 98) **4.** a (p. 96) **5.** j (p. 96) **6.** b (p. 97) **7.** k (p. 129) **8.** d (p. 131) **9.** c (p. 132) **10.** i (p. 132) **11.** g (p. 96)

Progress Test 2

Multiple-Choice Questions

1. c. is the answer. (p. 96)
b. & d. Each cell of the human body contains hundreds of genes.

2. b. is the answer. (p. 96)
a. Hormones are chemical messengers produced by the endocrine glands.
c. & d. Genes are segments of DNA, which are the make-up of chromosomes.

3. c. is the answer. (p. 96)
a. This defines DNA.
b. This defines a gene.
d. The genes provide the code for synthesizing proteins.

4. c. is the answer. (p. 97)

5. a. is the answer. (p. 108)

6. b. is the answer. (p. 110)
a. Testosterone levels have not been linked to the frequency of casual sex.
c. & d. Males are far more accepting of casual sex than are females.

7. d. is the answer. (pp. 112–113)

8. b. is the answer. (pp. 99–100)
a., c., & d. Despite being raised in different environments, long-separated identical twins often have much in common, including likes, dislikes, and life-styles. This indicates the significant heritability of many traits.

9. b. is the answer. (pp. 100–101)
a., c., & d. The personalities of adopted children do not much resemble those of their adoptive parents (therefore, not a.) or other children reared in the same home (therefore, not c. or d.).

10. c. is the answer. (pp. 101, 117)
a. & d. Temperament, which refers to a person's emotional reactivity, is determined primarily by genes.
b. Genes limit parents' influence on their children's personalities.

11. a. is the answer. (p. 96)
b. Neurotransmitters are the chemicals involved in synaptic transmission in the nervous system.
d. Enzymes are chemicals that facilitate various chemical reactions throughout the body but are not involved in heredity.

12. d. is the answer. (p. 105)
a. A norm is a culturally determined set of expected behaviors for a particular role, such as a gender role.
b. & c. When two factors are correlated, it means either that increases in one factor are accompanied by increases in the other (positive correlation) or that increases in one factor are accompanied by decreases in the other (negative correlation).

13. d. is the answer. (p. 122)

14. c. is the answer. (p. 118)

15. c. is the answer. (pp. 119–121)

16. a. is the answer. (p. 131)
b. In such cultures gender differences in mate preferences tend to be much smaller.
c. Although flexibility in gender roles was not discussed per se, it is likely that greater flexibility would equate with greater equality in gender roles.
d. All cultures develop norms.

17. a. is the answer. This is an example of a trait that contributes to survival of the human species and the perpetuation of one's genes. (p. 101)
b., c., & d. These traits and issues would likely be of greater interest to a behavior geneticist, since they concern the influence of specific genes on behavior.

18. c. is the answer. (p. 132)
b. & d. There is no evidence that being raised in a "gender neutral" home confuses children or fosters a backlash of excessive gender-typing.

19. c. is the answer. (p. 130)

20. **c.** is the answer. (p. 115)
a. Although early experiences are a factor in the development of attachment (discussed in a later chapter), educational stimulation is probably less important than warmth and nurturance.
b. Because temperament appears to be a strongly genetic trait, it is unlikely that early educational experiences would affect its nature.

True–False Items

1. F (p. 111)
2. F (p. 102)
3. F (p. 101)
4. F (p. 103)
5. T (p. 105)
6. F (p. 118)
7. T (p. 108)
8. F (p. 122)
9. T (p. 116)
10. T (p. 120)
11. T (p. 115)

Psychology Applied

Multiple-Choice Questions

1. **a.** is the answer. (p. 96)
b. DNA is a molecule.
c. & d. Genes are segments of DNA.

2. **c.** is the answer. Heritability is a measure of the extent to which a trait's variation within a group of people can be attributed to heredity. (p. 102)
a. & b. Heritability is not a measure of how much of an individual's behavior is inherited, nor of the relative contribution of genes from that person's mother and father. Furthermore, the heritability of any trait depends on the context, or environment, in which that trait is being studied.

3. **b.** is the answer. (pp. 96, 97–98)
a. Evolutionary psychologists study the evolution of behavior using the principles of natural selection.
c. Molecular geneticists search for the specific genes that influence behaviors. In his example, the researcher is merely comparing twins.
d. Who knows?

4. **c.** is the answer. (pp. 98, 103)
a. Although heredity does influence certain traits, such as outgoingness and emotional instability, it is the interaction of heredity and experience that ultimately molds personality.
b. There is no single "most important factor" in personality. Moreover, for the same reason two sisters or brothers often have dissimilar personalities, a sister and brother may be very much alike.
d. Karen and John's case is not at all unusual.

5. **d.** is the answer. (pp. 114–115)
a. & b. Premature birth and fetal alcohol syndrome (discussed in a later chapter) usually do not have this effect on the developing brain.
c. If the question had stated "I have a heavier and thicker cortex," this answer would be correct.

6. **b.** is the answer. Although parental values differ from one time and place to another, studies reveal that Western parents today want their children to think for themselves, while Asian and African parents place greater value on emotional closeness. (p. 124)
d. Both of these values are more typical of Asian than Western cultures.

7. **d.** is the answer. To separate the influences of heredity and experience on behavior, one of the two must be held constant. (pp. 99–100)
a., b., & c. These situations would not allow one to separate the contributions of heredity and environment.

8. **b.** is the answer. (pp. 121–122)
a. Because they are genetically the same, identical twins are always of the same sex.
c. & d. Fraternal twins develop from two fertilized eggs.

9. **d.** is the answer. (pp. 108–109, 111)

10. **b.** is the answer. Because their environments are largely the same, differences in the traits of such individuals are likely to be due to genetic differences. (p. 103)
c. & d. If two individuals are genetically similar, any differences in their behaviors and traits are likely to be due to environmental factors.

11. **d.** is the answer. (p. 129)

12. **b.** is the answer. Actually, only 5 percent are differences among population groups. (p. 108)

13. **a.** is the answer. (p. 113)
b. & c. In fact, these are typical criticisms of evolutionary psychology.

14. **c.** is the answer. (p. 98)

15. **b.** is the answer. (p. 105)
a. An interaction requires at least two variables; in this example there is only one (competition).
c. This is an example of a negative correlation.
d. This is an example of a positive correlation.

16. **d.** is the answer. (p. 108)

17. **d.** is the answer. (p. 110)
a., b., & c. These are typical male attitudes and behaviors.

18. **d.** is the answer. Following social learning theory, Brandon is using verbal punishment to discourage what he believes to be an inappropriate gender-linked behavior in his son. (p. 132)
a. Gender schema theory maintains that children adjust their behaviors to match their cultural con-

cept of gender. In this example, we have only the father's behavior on which to base our answer.
b. & c. No such theories were discussed.

19. **a.** is the answer. Many aspects of language, including masculine and feminine pronouns, provide children with schemas through which they begin organizing their worlds on the basis of gender. (p. 132)
20. **a.** is the answer. (p. 103)
b., c., & d. Temperament is one of the most stable personality traits.

Essay Question

Evolutionary psychologists would not be surprised by the tension between Lakia and Jerome and would see it as a reflection of women's more relational and men's more recreational approach to sex. Since eggs are expensive, compared with sperm, women prefer mates with the potential for long-term investment in their joint offspring. According to this perspective, this may be why Lakia is not in a hurry to become sexually intimate with Jerome. Men, on the other hand, are selected for "pairing widely" but not necessarily wisely in order to maximize the spreading of their genes. This is especially true of men like Jerome, who have traditional masculine attitudes.

Key Terms

Writing Definitions

1. In behavior genetics, **environment** refers to every nongenetic, or external, influence on our traits and behaviors. (p. 96)
2. **Behavior genetics** is the study of genetic and environmental influences on behavior. (p. 96)
3. **Chromosomes** are threadlike structures made of DNA molecules, which contain the genes. In conception, the 23 chromosomes in the egg are paired with the 23 chromosomes in the sperm. (p. 96)
4. **DNA** (deoxyribonucleic acid) is a complex molecule containing the genetic information that makes up the chromosomes. (p. 96)
5. **Genes** are the biochemical units of heredity that make up the chromosomes; they are segments of the DNA molecules capable of synthesizing a protein. (p. 96)
6. A **genome** is the complete set of genetic instructions for making an organism. (p. 96)
7. **Identical twins** develop from a single fertilized egg that splits in two and therefore are genetically identical. (p. 97)
8. **Fraternal twins** develop from two separate eggs fertilized by different sperm and therefore are no more genetically similar than ordinary siblings. (p. 98)
9. **Temperament** refers to a person's characteristic emotional reactivity and intensity. (p. 102)
10. **Heritability** is the proportion of variation among individuals in a trait that is attributable to genetic factors. Current estimates place the heritability of intelligence at about 50 to 70 percent. (p. 102)
11. An **interaction** occurs when the effects of one factor (such as environment) depend on another factor (such as heredity). (p. 105)

    Example: Because the way people react to us (an environmental factor) depends on our genetically influenced temperament (a genetic factor), there is an **interaction** between environment and heredity.
12. **Molecular genetics** is the subfield of biology that seeks to identify the specific genes that influence specific human traits and behaviors. (p. 105)
13. **Evolutionary psychology** is the study of the evolution of behavior and the mind, using the principles of natural selection. (p. 107)
14. **Natural selection** is the evolutionary principle that traits that contribute to reproduction and survival are the most likely to be passed on to succeeding generations. (p. 108)
15. **Mutations** are random errors in gene replication that are the source of genetic diversity within a species. (p. 108)
16. **Gender** refers to the biological and social characteristics by which people define *male* and *female*. (p. 110)
17. A **culture** is the enduring behaviors, ideas, attitudes, and traditions shared by a large group of people and transmitted from one generation to the next. (p. 119)
18. **Norms** are understood social prescriptions, or rules, for accepted and expected behavior. (p. 120)
19. **Personal space** refers to the buffer zone, or mobile territory, that people like to maintain around their bodies. (p. 120)
20. **Individualism** is giving priority to personal goals over group goals and defining one's identity in terms of personal attributes rather than group identification. (p. 121)
21. **Collectivism** is giving priority to the goals of one's group, and defining one's identity accordingly. (p. 121)

22. **Aggression** is physical or verbal behavior intended to hurt someone. (p. 127)
23. The **X chromosome** is the sex chromosome found in both men and women. Females inherit an X chromosome from each parent. (p. 129)
24. The **Y chromosome** is the sex chromosome found only in men. Males inherit an X chromosome from their mothers and a Y chromosome from their fathers. (p. 129)
25. **Testosterone** is the principal male sex hormone. During prenatal development, testosterone stimulates the development of the external male sex organs. (p. 130)
26. A **role** is a cluster of prescribed behaviors expected of those who occupy a particular social position. (p. 131)
27. A **gender role** is a set of expected behaviors for males and females. (p. 131)
28. **Gender identity** is one's personal sense of being male or female. (p. 132)
29. **Gender-typing** is the acquisition of a traditional feminine or masculine gender role. (p. 132)
30. According to **social learning theory**, people learn social behavior (such as gender roles) by observing and imitating and by being rewarded or punished. (p. 132)
31. According to **gender schema theory**, children acquire a cultural concept of what it means to be female or male and adjust their behavior accordingly. (p. 132)

Cross-Check

ACROSS

6. adoptive
7. DNA
9. role
10. norm
11. gender
12. culture
13. nurture
14. affluent
15. biological
16. mutation
19. heritability
20. chromosome

DOWN

1. behavior genetics
2. evolutionary
3. interaction
4. environment
5. gender schema
8. gender identity
17. nature
18. genes

FOCUS ON VOCABULARY AND LANGUAGE

Behavior Genetics: Predicting Individual Differences

Page 97: To *disentangle the threads* of heredity and environment, behavior geneticists often use *two sets of tweezers*: twin studies and adoption studies. Myers is using an analogy here: to separate out (*disentangle*) two different strings (*threads*) that are tightly intertwined, you can use a small pincers (*tweezers*). Similarly, in an attempt to discover and separate out (*tease apart*) the differential effects of the environment and genes (*threads that are entangled*), behavior geneticists use two approaches (*two sets of tweezers*): twin studies and adoption studies.

Page 99: blue-collar families . . . This phrase refers to a social category based on the type of work people do. Traditionally, manual workers wore blue (denim) work shirts (*blue-collar workers*) in contrast to office workers, managers, etc., who wore white shirts (*white-collar workers*). The identical twins (both named Jim) were adopted by similar working-class (*blue-collar*) families.

Page 100: The stories of *startling twin similarity* do not impress Bouchard's critics, who remind us that "the plural of anecdote is not data." Bouchard's investigation into the similarities between separated twins suggests that genes influence many behaviors, such as career choices, TV-watching habits, and food likes and dislikes (*startling stories*). The critics point out that any two strangers of the same sex and age would probably have many coincidental things in common if they were to spend hours comparing their behaviors and life histories. Furthermore, stories by, or about, individuals (*single anecdotes*) do not constitute scientific data, even if there are many of them (*the plural of anecdote is not data*).

Page 101 (margin): "Mom may be *holding a full house while Dad has a straight flush,* yet when Junior gets a random half of each of their cards his *poker-hand may*

be a loser" David Lykken (2001). To make sense of this quote you need to be familiar with card games such as poker. In this game, a "full house" and a "straight flush" are sequences of cards (*hands*) that usually are winners. Even if Mom and Dad have "winner" sets of genes, similar to the winning cards in poker, the random genes they pass on to their offspring (*Junior*) will not necessarily be a "winning" set of genes too (*his poker-hand may be a loser*).

Page 103: We all are driven to eat, but depending on our culturally learned tastes, we may have a *yen* for fish eyes, black bean salad, or chicken legs. *Go barefoot* for a summer and you will develop toughened callused feet—a biological adaptation to friction. Meanwhile, your *shod neighbor will remain a tenderfoot.* The enormous adaptive capacity is a common, but extremely valuable, characteristic of human beings (*the behavioral hallmark of our species*). We share a need for food (*we all are driven to eat*); however, our particular food preferences tend to be learned, and our desire (*yen*) for various foods is typically culturally transmitted. If someone doesn't wear shoes (*he goes barefoot*), his feet will become tough, which is a biological adaptation. If a person wears shoes (*your shod neighbor*), his feet will be tender or soft (he will be a *tenderfoot*); this is also the product of a biological mechanism. However, it is the environment that causes the difference between the two people. (Note: the word *tenderfoot* traditionally referred to someone who was new to ranching in the western United States and is now used to describe any newcomer or novice.)

Page 104: Thus, asking whether your personality is more a product of your genes or environment is like asking . . . whether *the area of a field is more the result of its length or width.* The area of a space, such as a soccer field or a football field, is determined by multiplying the length by the width. Obviously, you cannot find the area of the field without both length and width. Likewise, we do not become who we are without both nature and nurture. As Myers notes, for psychological characteristics, human differences are almost always the result of both genetic (*nature*) and environmental (*nurture*) factors.

Page 105 . . . sleuth . . . A *sleuth* is a detective. Just like detectives trying to catch the criminal and solve the crime, researchers throughout the world are currently trying to locate (*sleuth*) the genes responsible for many disorders.

Page 106: Blueprints for "designer babies" . . . A *blueprint* is an architectural term for a copy of an original diagram or plan used as a working drawing for creating a building or structure. Myers notes that genes and environment interact. Genes, rather than acting as master plans (*blueprints*) that always lead to the same result, instead react and respond to their environments. Thus, people with identical genes (identical twins) but with different experiences end up with similar but not identical minds.

Page 106: But as always, progress is a *two-edged sword*, raising both hopeful possibilities and difficult problems. Myers is using the metaphor of a sword with two cutting edges (*two-edged sword*) to illustrate the fact that progress has two aspects to it, one positive (hopeful possibilities) and one negative (new ethical issues and difficult problems).

Evolutionary Psychology: Understanding Human Nature

Page 108: cash-strapped . . . This means to be in desperate need of money (*strapped for cash*). Russian researchers selectively bred only the tamest and friendliest foxes from each of 30 generations over a 40-year period. The present breed of foxes are affectionate, docile, and eager to please; in order to raise funds for the financially destitute (*cash-strapped*) institute, they are being marketed as house pets.

Page 108: But the tight genetic *leash . . .* is looser on humans. Just as a dog is restrained or held in check by a strap or cord (*leash*), genes generally determine the fairly rigid or fixed patterns of behaviors of many animals. In humans, however, genes are less influential; thus, the usually strong genetic constraints (*tight genetic leash*) operate in a less determined way (*are looser*).

Page 110: Casual, impulsive sex is most frequent among males with traditional masculine attitudes (Pleck & others, 1993). There are large gender differences in sexual values and attitudes, which are reflected in differences in male-female behaviors. Males (especially those with stereotyped views of females) tend to be lacking in restraint (*impulsive*) and nonchalant (*casual*) about having sex with someone they have just met and hardly know (*casual, impulsive sex*).

Page 110: Men also have a lower threshold for perceiving warm responses as a *sexual come-on*. Males will typically misinterpret an affable, affectionate, friendly female's behavior (*her warmth*) as an invitation to have sex (*a sexual come-on*). Numerous studies have shown that men are more likely than women to attribute a woman's friendliness to sexual interest.

Page 111: In our *ancestral history*, women most often sent their genes into the future by *pairing wisely*, men by *pairing widely*. Evolutionary psychologists note

that our normal desires (*natural yearnings*) help perpetuate our genes. In our evolutionary past (*ancestral history*) females accomplished this best by being selective in their choice of mate (*pairing wisely*) and men by more promiscuous behavior (*pairing widely*). Myers points out, however, that environmental factors, such as cultural expectations, can alter or shape how sexual behavior is expressed by both males and females (*can bend the genders*).

Page 111: They (women) prefer *stick-around dads over likely cads.* Women tend to prefer males who are more likely to be supportive of their children (their *offspring*) and who are also more willing to make a lasting contribution to their protection (*stick-around dads*) rather than males who indicate little or no willingness to make such a co-parenting commitment (*likely cads*).

Page 111: As *mobile gene machines*, we are designed to prefer whatever worked for our ancestors in their environments. Evolutionary psychologists believe that behavioral tendencies that increase the probability of getting one's genes into the future have been selected for over the course of evolution. Humans who actively seek out mates and successfully procreate (*mobile gene machines*) are passing on inherited tendencies to behave in certain ways (*our natural yearnings*) because these behaviors were adaptive for our ancestors.

Parents and Peers

Page 115: During early childhood—while the excess connections are *still on call*— . . . . To *be on call* means to be ready and available for use. Thus, during the early childhood years while there are many neural connections ready for use (*still on call*), an enriched and stimulating environment is extremely important for intellectual, perceptual, and social development. As Myers puts it, ". . . use it or lose it."

Page 115: Similar to *pathways* through a forest, less traveled paths gradually disappear, and *popular paths* are broadened. This analogy suggests that brain development goes on throughout life. Neural connections (*pathways*) that are frequently used (*popular paths*) are widened and more clearly defined, while those connections that are seldom used (*in disuse*) become weakened and may eventually disappear.

Page 116: In procreation, a woman and a man *shuffle their gene decks and deal a life-forming hand* to their child-to-be . . . The idea here is that just as cards are randomly interspersed (*shuffled*) and then passed on (*dealt*) to the players, a man and a woman intermingle their genes (*shuffle their gene decks*) and conceive offspring (*deal a life-forming hand to their child-to-be*). The child is then exposed to numerous environmental factors beyond parental control that limit how much the parents influence the child's development (*children are not formless blobs sculpted by parental nurture*).

Page 116: And society reinforces such parent-blaming: Believing that parents shape their children as a *potter molds clay*, people readily praise parents for their children's virtues and blame them for their children's vices. Myers suggests that, because some factors that affect development are under the parent's control and others are not, it is not appropriate to be judgmental. We should be slower to praise parents for their children's achievements (children's virtues) and slower yet to be critical when the children do not perform up to our expectations (children's vices). Children are not simply formed by their parents' child-rearing abilities (*as a potter molds clay*) but rather are influenced by many factors beyond their control.

Page 118: If the vapors of a toxic climate are seeping into a child's life, that climate—not just the child—needs *reforming*. Myers is suggesting that when problem behaviors arise it is important to look at the whole context that is influencing the child rather than just focusing on the youngster. If the environment (*whole school or neighborhood*) is unhealthy and dangerous (*a toxic climate*) and is slowly leaking (*seeping*) into a child's life, then it is important to change (*reform*) these environmental influences instead of simply trying to change the child.

Cultural Influences

Page 119: We come equipped with a huge *cerebral hard drive ready to receive many gigabytes of cultural software.* Myers is comparing our capacity to learn and adapt through cultural transmission to that of a computer's operating system (*cerebral hard drive*) which, like a human, is capable of receiving very large amounts of information through programming (*gigabytes of cultural software*).

Page 120: Yet, norms *grease the social machinery.* Every society has its own rules and regulations about accepted and appropriate modes of conduct (social norms), and these standards differ from culture to culture. These proscriptions may sometimes seem unjust or senseless, but because they are known and

practiced by most people, they serve the function of helping society run smoothly (*they grease the social machinery*).

Page 120: When cultures collide, their differing norms often *befuddle*. When people from different cultures meet, the interaction can be confusing (*befuddling*). Personal space (the distance we like to have between us and others) varies; someone who prefers more space may end up constantly retreating (*backpedaling*) from someone who needs to be close in order to have a comfortable conversation.

Page 120: . . . *standoffish* . . . This means to be distant or unfriendly in social interactions. North Americans have a need for a bigger personal space than do people from some other cultures. So, when that space is infringed upon (*invaded*), the natural reaction is to back away, which may give the impression of being aloof and unfriendly (*standoffish*).

Gender Development

Page 128: These gender differences *surface early,* in children's play. Males and females differ in their feelings of belonging (*connectedness*), a disparity that is noticeable from a young age (*surfaces early*). When playing, boys tend to engage in competitive group activity without much close, confidential, or affectionate dialogue. Girls typically are more intimate with each other and play in smaller groups, frequently with one friend, and they are less competitive and more supportive and empathic.

Page 130: The Y chromosome includes a single gene that *throws a master switch* triggering the testes to develop and produce the principal male hormone, testosterone. . . . We all get an X chromosome from our mothers and either an X (you'll be a girl) or a Y (you'll be a boy) from our fathers. Thus, the Y chromosome is crucial to making males, and a single gene is responsible for initiating the process (*it throws the switch*) that activates (*triggers*) the production of testosterone by the testes.

Page 130: . . . "*tomboyish*" . . . A tomboy is a girl who likes to play boys' sports and games. When a female embryo is exposed to too much testosterone (the male sex hormone), the developing child will act more aggressively and behave in ways more typical of boys (she will act in a *tomboyish* way).

Page 131: Thirty years ago, it was standard for men to *initiate dates*, drive the car, and *pick up the check*, and for women to decorate the home, buy and care for the children's clothes, and select the wedding gifts. Gender roles are a culture's expectations for male and female behaviors, but these behaviors change over time and across cultures, and vary from generation to generation. Traditionally (*as was common practice 30 years ago*), males asked females to go out (*initiated dates*) and paid for the meal and entertainment (*picked up the check*), and women looked after domestic concerns, including purchasing and looking after the children's clothes and choosing presents for those who were getting married (*wedding gifts*).

Page 131: With the *flick of an apron*, the number of U.S. college women hoping to be full-time homemakers *plunged* during the late 1960s and early 1970s. Over time, gender roles have changed. Within a relatively brief period of time (*with the flick of an apron*), the number of women engaged in the traditional female role (full-time homemaker) declined rapidly (*plunged*) and the number of women in the work force increased substantially, especially in traditional male fields such as medicine, law, and engineering.

Reflections on Nature and Nurture

Page 136: won the day . . . Galileo's theory that the Earth revolved around the Sun, and not the other way around (vice-versa), was eventually accepted (*it won the day*). His explanation was a coherent account (*it hung together*) of the way the solar system actually works.

Page 136: It *boggles* the mind—the entire universe *popping out of a single point* some 14 billion years ago. . . . When something is startling, unexpected, or hard to comprehend, we say that "it *boggles* the mind." The idea that the entire universe arose from a singularity (*popped out of a single point*) approximately 14 billion years ago is one such "mind-boggling" idea that leaves even scientists full of reverence and wonder (*they are awestruck*).