

Chapter in Review

1. Heredity is the tendency of offspring to resemble their parents in various ways. Genes are units of heredity. They are functional strands of DNA grouped along each chromosome of every cell. DNA contains the unique “code” for creating each living organism, and it is therefore the basis for passing on hereditary characteristics in humans. Genes come in different “versions” or alleles. The unique collection of alleles in an individual that contribute to (or entirely determine) some trait or characteristic is known as the genotype for that characteristic.
1. Phenotypes are potentially observable traits or characteristics of an organism. The human genome is the set of hereditary instructions that exists within every cell and programs the amino acids and proteins they construct to build a human organism.
2. Genes have at least three functions: to create proteins by transmitting genetic information through RNA; to replicate; and to interact with other genes by “switching them on and off.”
3. Behavior genetics is the scientific study of the influence of genes and environments on individual differences in traits and behavior. Behavior geneticists use studies of twins reared together, twins reared apart, and studies of adopted children to try to estimate the proportion of individual differences on various traits in a given sample of individuals that can be attributable to genetic heredity and the proportion that is due to experiences after conception—in the womb and during the individual’s life. Collectively, all influences on traits that occur after conception are known as environmental influences.
4. The environment shared by all individuals in a family during development (e.g., family income, child rearing style, ethnicity, etc.) is known as the shared environment. Unique experiences of each individual member of a family during development constitute the nonshared environment (e.g., experiences in the womb, unique childhood experiences, etc.). Behavior genetics research strongly suggests that the nonshared environment is responsible for most of the environmental influence on differences in cognitive ability and personality traits in human beings.
5. Although the influences of genes and environments can to some degree be disentangled, in some respects they can never be disentangled; and it is also true that genes and environments may interact and influence one another. A gene-environment correlation occurs when a person’s environment is a reflection of, or is somehow correlated with, that person’s genotype. There are two types of gene-environment correlations: active and reactive. A gene-environment interaction occurs when the same type of experience affects people differently as a result of differences in these individuals’ genotypes.
6. Evolution is both fact and theory. The fact of organic and geological evolution is accepted by virtually all scientists working in the life sciences. However, theories about how evolution occurs are often debated. The theory of natural selection as described by Charles Darwin is the most plausible theory of how important evolutionary events occur. Evolutionary psychology uses Darwinian theory as its

- guiding theory. Evolutionary psychology is less a field in itself than an approach to virtually any field in psychology.
7. Accumulated characteristics of an organism that have resulted from natural selection as solutions to specific “problems” the organism’s ancestors faced over evolutionary time, and that allow the organism to be well suited to its environment, are known as adaptations. Just as the human brain is made up of a large number of complex, evolved biological adaptations that are integrated with one another, evolutionary psychologists believe that the human mind is constructed of a large number of evolved, integrated psychological adaptations. Because these adaptations are shared by virtually all members of our species to varying degrees, evolutionary psychologists believe that humans are a single species with a single human nature.
 8. Because psychological adaptation occurred among human ancestors over evolutionary time in environments in certain respects very different from modern environments, some adaptations may no longer be “adaptive” in these modern environments (e.g., taste preference for sweet and fatty food). This is known as environmental mismatch.
 9. Human sex differences are a “test case” for evolutionary psychology. Evolutionary psychologists propose that in most respects men and women have faced the same evolutionary pressures over the millennia, and should be expected to have the same psychological adaptations as a result. However, in the areas of sexuality, reproduction, and physical aggression men and women have faced vastly different pressures, and therefore sex differences in adaptations in these areas of life should be expected. For example, sex differences in interest in casual sex (short-term mating) and partner variety have been shown to exist. Evolutionary psychologists propose that these sex differences may best be explained by Robert Trivers’s theory of parental investment and sexual selection.
 10. Society and culture help shape mind and behavior. A society is any enduring and cooperative group whose members have developed institutions and organized patterns of interaction. Culture describes the total pattern of behavior exhibited by citizens of a given society. Psychologists studying the influence of society and culture on psychology take the sociocultural perspective. This perspective is strongly associated with the field of cultural psychology—the comparative study of psychology in different cultures. Cultural psychologists emphasize that different cultures are characterized by different behaviors and subjective experiences. However, numerous similarities among cultures also exist, and certain aspects of psychology may be universal among all cultures.
 11. Humans are not the only species with culture, but human culture pervades virtually every aspect of thought and behavior, and it proliferates rapidly over generations. Human cultures differ in many specific ways, but Geert Hofstede has established specific dimensions of behavior along which cultures typically differ. The most critical of these dimensions are: individualism vs. collectivism, power distance, masculinity-femininity, and uncertainty avoidance. Although cultures differ to some degree in their ideas about morality, morality itself is a human universal.

12. Cultural research suggests that some characteristics believed to be universal by many researchers may actually be primarily characteristics of Western peoples. These characteristics include self-enhancement, the tendency to focus on one's good qualities while downplaying the bad; vulnerability to the fundamental attribution error (FAE), the tendency to attribute another person's behavior to that person's inner dispositions and character traits while downplaying the possibility that situational factors may have played a large role in causing the behavior; attributing human characteristics to nonhuman animals (anthropomorphizing); and subscribing to the idea that there are no negative consequences to friendship.
13. Social role theory proposes that people behave in highly variable ways according to differences in the type of social organization in which they live. In particular, social role theorists have attempted to explain sex differences in sexual psychology and behavior as emerging from the effects of patriarchal social organization and the division of labor over the millennia. These theorists deny that evolutionary forces are at work.
14. When different theories address different aspects or levels of the same question, without necessarily disagreeing with one another outright, it is said that they differ in level of analysis. Evolutionary and social role theories of sex differences do not necessarily contradict one another as fundamentally as it might seem at first—they are addressing different aspect of the same questions.

Section Summaries *What are genes?*

1. Genes are functional units of heredity, made of bits and pieces of DNA grouped together along chromosomes. They do their work by synthesizing proteins via RNA, making copies of themselves, and acting as “switches” to turn other genes on and off. Genes may come in two or more “versions” known as alleles.
2. The human genome is the set of genetic programming “instructions” for building a human being (as opposed to another life form). A person’s genotypes are unique arrangements of alleles that have contributed to, or in certain cases entirely determined, that person’s characteristics.
3. The nuclei of almost all human cells contain 23 pairs of chromosomes, rod-like bodies composed of proteins and strands of DNA. Functional units made of bits and pieces of DNA are grouped together along each chromosome and are known as genes. They transmit hereditary characteristics from parents to their offspring. Genes play an important part in the development of psychological traits.
4. Genes have three main functions. The first is to create proteins by transmitting genetic information through RNA. The second function is to replicate. The third function is to act as a “switch,” turning other genes on and off.
5. Genes can only do their work in an environment that is adequate.

Why are psychologists interested in genetics?

1. Behavior genetics is the study of the influences of genes and environments on individual differences in behavior.
2. Behavior geneticists use samples of twins and adopted children to compute statistics of heritability (h^2). The heritability statistic is an estimate of the proportion of differences in a sample of individuals that is due to genetic heredity. Subtracting the heritability estimate from 1.0 leaves the proportion of differences due to environmental causes.
3. Studies of identical (monozygotic) twins reared apart show that these twins are almost as similar as identical twins reared together on a large number of cognitive and personality characteristics. When both twin and adoption studies are averaged out, the heritability of cognitive abilities, personality traits, and social attitudes is about 0.25–0.50, with cognitive ability showing the highest heritability and personality characteristics and social attitudes showing the lowest.
4. Gene-environment correlations occur when a person’s environment is a reflection of, or is somehow associated with, his or her genotype. There are two types of gene-environment correlations: active and reactive. Gene-environment interactions occur when people with different genotypes encounter the same environmental experience but respond differently as a result of their genotypes.

Why are psychologists interested in evolution?

1. Evolution is both theory and fact. It is a fact that evolution has occurred, but the mechanisms of evolution—such as natural selection—are theories that are still debated to some extent.
2. Natural selection occurs because the resources needed to sustain life for each species are always limited. There is competition for these resources, and in any given environment, those best suited to surviving and reproducing leave the most

- descendants. These descendants at least to some degree inherit the characteristics that enabled their genetic ancestors to survive and reproduce. Over many generations, these characteristics create small, incremental changes in the species that are beneficial in the struggle to survive and reproduce. The incremental changes that accumulate over evolutionary time are termed *adaptations*.
3. Mainstream evolutionary psychology is characterized in part by adherence to the notions of psychological adaptation and environmental mismatch.
 4. Although evolutionary psychologists argue that humans have a single unified human nature, regardless of geography or race, they expect sex differences in psychology, particularly in behavior related to sexuality, reproduction, and aggression.
 5. Robert Trivers's theory of parental investment and sexual selection suggests that in any sexually reproducing sex, one sex will have a greater minimal investment in reproduction than will the other sex. This will result in numerous sex differences in behavior related to sexuality, reproduction, and physical aggression. It is also responsible for average sex differences in size and the tendency to develop ornamentation with no apparent function other than attracting mates.
 6. Evolutionary psychologists have been criticized for not including enough cross-cultural samples in their research, failing to develop convincing theories to account for individual and cultural differences in behavior, and incorrectly interpreting Darwin's theories.

What is the sociocultural perspective?

1. The sociocultural perspective focuses on the ways societies and cultures mold human psychology and influence behavior.
2. Cultural psychologists are interested in cultural similarities as well as differences, but they tend to emphasize cultural differences. The four principal dimensions along which cultures differ are individualism vs. collectivism, power distance, masculinity-femininity, and uncertainty avoidance.
3. Cultural differences in psychology explored in this chapter include: East-West differences in the tendency to self-enhance, differences in the tendency to commit the fundamental attribution error (FAE), differences between native American and European American children's "folk biology," and differences between West African and North American conceptions of friendship.
4. Social role theory proposes that sex differences may be explained by the opportunities and constraints under which men and women live in patriarchal society.