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Chapter 15
Buss: Evolutionary Theory of Personality

Learning Objectives

After reading this chapter, students should be able to accomplish the following objectives:

1. List and discuss Darwin's key components to evolutionary theory.
2. Describe the evolutionary theory foundational background to Buss's work.
3. Discuss the term "evolutionary psychology" and the four basic questions that focus on the evolutionary perspective.
4. Explain the relationship between evolutionary theory and personality theory.
5. Describe Buss's model of personality and its relationship to McCrae and Costa's Big Five model.
6. Discuss Buss's "origins of individual differences" and the four sources of difference.
7. List and describe Buss's key five personality dimensions.
8. Compare some of the current pros and cons of Buss's theory.
9. Describe the three general topics in Buss's related research.
10. Discuss and critique evolutionary theory with respect to the concept of humanity.

Lecture Outline

I. Overview of Evolutionary Theory

Charles Darwin (1859) laid the foundation for the modern theory of evolution, even though the theory itself has been around since the ancient Greeks. Darwin's major contribution was not the theory of evolution but rather an explanation for how evolution works, namely through selection (natural and sexual) and chance. Chance occurs mostly through random genetic mutation, and there isn't much to say about chance. Instead, this chapter focuses on selection of three different kinds: artificial selection, natural selection, and sexual selection.

In order to understand natural and sexual selection, students need to examine a similar concept created by humans and one that provided Darwin with his key insight: artificial selection. **Artificial selection** (otherwise known as "breeding") occurs when humans select particular desirable traits in a breeding species. **Natural selection** is simply a more general form of artificial selection in which nature rather than people selects the traits. **Sexual selection** operates when members of the opposite sex find certain traits more appealing and attractive than others and thereby produce offspring with those traits.

The evolutionary process (natural and sexual selection and chance) results in three distinct outcomes: adaptations, by-products, and noise (D. Buss, 1999; Tooby & Cosmides, 1992).

Adaptations are evolved strategies that solve important survival and/or reproductive problems. Adaptations are often the products of natural or sexual selection and must have a genetic or inherited basis to them. Sweat glands, for example, are adaptations because they solve the problem of thermal regulation.

By-products are traits that happen as a result of adaptations but are not part of the functional design (D. Buss, 1999; Tooby & Cosmides, 1992). By-products "come along for the ride" of natural or sexual selection. **Noise**, also known as "random effects," occurs when evolution produces random changes in design that do not affect function. Noise tends to be produced by chance and not selected for.

II. Biography of David Buss

David Buss was born on April 14, 1953, in Indianapolis, Indiana, to Arnold H. Buss, Sr. and Edith Nolte. Arnold H. Buss, Sr., earned his PhD in psychology from Indiana University in the early 1950s and was a professor of psychology at the University of Pittsburgh, Rutgers, and finally the University of Texas, where he is currently Professor Emeritus. Arnold Buss's research focused on aggression, psychopathology, self-consciousness, and social anxiety (A. Buss, 2008).

Even though David Buss grew up in an academic family, in his teens he drifted toward mediocre grades in school and got involved in drugs in high school, even being arrested twice on drug charges (D. Buss, 2004). In contrast to his middle school and high school performance, as an undergraduate in college David Buss excelled and developed a passion for psychology and human behavior and went on to a PhD program in personality psychology at the University of California at Berkeley from 1976 to 1981.

His first professorship position was at Harvard University, where he continued the act-frequency research but increasingly turned his attention to his first love in psychology, evolutionary theory. David Buss has garnered many awards over the course of his career, including the Early Career Contribution to Personality Psychology by the American Psychological Association in 1988 and being elected Fellow to both the American Psychological Association and the American Psychological Society.

III. Principles of Evolutionary Psychology

Charles Darwin and Herbert Spencer were the first thinkers to argue for an evolutionary perspective of psychological thought and behavior. The term **evolutionary psychology** can be defined as the scientific study of human thought and behavior from an evolutionary perspective and focuses on four big questions (Buss, 1999):

- Why is the human mind designed the way it is, and how did it come to take its current form?
- How is the human mind designed; that is, what are its parts and current structure?
- What function do the parts of the mind have, and what is it designed to do?

- How do the evolved mind and current environment interact to shape human behavior?

IV. Evolutionary Theory of Personality

Most personality theories assume that personality is caused by environmental events alone and seldom mention any biological component. Evolutionary theory, however, assumes that the true origins of personality traits reach far back to ancestral times. The true origin of personality is evolution, meaning that it is caused by an interaction between an ever-changing environment and a changing body and brain. Evolutionary theory is one of the few recent theories of personality that attempts once again to explain the grand view of human personality—its ultimate origins as well as its overall function and structure.

The field of evolutionary personality psychology itself has been divided by psychologists arguing for two solutions: Personality differences were either "noise" or they were perhaps "by-products" of evolved adaptive strategies (Tooby & Cosmides, 1990). More recently, however, other theorists have made the case for personality traits being something more than noise or by-products, namely adaptations (D. Buss, 1991, 1999; MacDonald, 1995; Nettle, 2006; Nichols, Sheldon, & Sheldon, 2008). David Buss was the first and most prominent theorist to take up the cause of developing an evolutionary theory of personality. The essence of Buss's theory of personality revolves around adaptive problems and their solutions or mechanism. Before discussing adaptations and their solutions, one must first review the nature and nurture of personality.

A. The Nature and Nurture of Personality

Personality is all about consistent and unique differences between individuals in how they think and behave. The question quickly becomes, "What causes these individual differences?" As with all questions about human behavior, it comes down to two fundamental answers: nature and/or nurture. That is, behavior and personality are caused by either internal qualities or external-environmental ones.

On the one side, there is what Buss called the **fundamental situational error**, or the tendency to assume that the environment alone can produce behavior void of a stable internal mechanism. On the other side, there is what social psychologists have called the **fundamental attribution error** to describe an individual's tendency to ignore situational and environmental forces when explaining the behavior of other people and instead focus on internal dispositions. Evolved mechanisms are good examples of the interaction of nature and nurture because they only exist in response to and with input from the environment.

One of the fundamental assumptions of evolutionary theory of personality is that these adaptive qualities include consistent and unique dispositions to behave in particular ways in particular contexts, in other words, personality traits.

B. Adaptive Problems and Their Solutions (Mechanisms)

Ever since Darwin, it has been clear that all life forms are confronted with two fundamental problems of adaptation, namely survival (food, danger, predation, etc.) and reproduction. In order to survive any living thing has to deal with what he called the "hostile forces of nature," which include disease, parasites, food shortages, harsh climate, predators, and other natural hazards (D. Buss, 1991). Individuals who solve these problems most efficiently and effectively are most likely to survive, and survival is a precondition for reproduction.

The process of evolution by natural selection has produced solutions to these two basic problems of life, and they are called **mechanisms**. More specifically, mechanisms function in the following ways:

- They operate according to principles in different adaptive domains.
- They number in the dozens or hundreds (maybe even thousands).
- They are complex solutions to specific adaptive problems (survival, reproduction).

There are two specific main classes of mechanism, namely physical and psychological. **Physical mechanisms** are physiological organs and systems that evolved to solve problems of survival, whereas **psychological mechanisms** are internal and specific cognitive, motivational, and personality systems that solve specific survival and reproduction problems. Psychological mechanisms have behavioral consequences, tactics, and actions associated with them (Buss, 1991, 1999).

C. Evolved Mechanisms

Psychological mechanisms relevant to personality can be grouped into three main categories:

- Goals/drives/motives
- Emotions
- Personality traits

Two goals and motives that act as evolved mechanisms are power and intimacy. Similarly, emotions are adaptations because they directly alert the individual to situations that are either harmful or beneficial to his or her well-being (Lazarus, 1991). Motivation and emotion are directly linked with stable personality traits (Buss, 1991; cf. MacDonald, 1995).

Buss's model of personality very closely resembles the Big Five trait approach of McCrae and Costa, but it is not identical in structure. Buss argues for essentially the same five personality dimensions but with slightly different terminology. Moreover, his view is that these behavioral dispositions have adaptive significance:

- Surgency/extraversion/dominance

- Agreeableness
- Conscientiousness
- Emotional stability (opposite of neuroticism)
- Openness/intellect

Surgency involves the disposition to experience positive emotional states and to engage in one's environment and to be sociable and self-confident. A second dimension of personality, **agreeableness/hostility**, is marked by a person's willingness and capacity to cooperate and help the group on the one hand or to be hostile and aggressive on the other. The third adaptive personality system revolves around response to danger and threat. In humans and other animals, this takes the form of anxiety as an emotional state and **emotional stability/neuroticism** as a dispositional trait. Fourth, one's capacity and commitment to work is the core characteristic of **conscientiousness**. Conscientious people are careful and detail-oriented as well as focused and reliable. Finally, the evolved strategy of **openness** involves one's propensity for innovation and ability to solve problems. It is closely aligned with intellect and intelligence but also a willingness to try new things and a willingness to have novel experiences rather than sticking with one's routine.

D. Origins of Individual Differences

Evolutionary theory is inherently a nature and nurture perspective when it comes to origins. Buss and his colleague Heidi Greiling propose four distinct sources of individual differences (D. Buss & Greiling, 1999). In essence, these sources of difference come down to nature (biological–genetic) and nurture (environmental–social). There are numerous ways in which the environment contributes to adaptive individual differences. Adaptive differences increase reproductive success and one's chance of survival. One environmental source of personality differences is what Buss termed *early experiential calibration*, by which he meant that childhood experiences make some behavioral strategies more likely than others. A second origin of environment-induced individual differences is *alternative niche specialization*, which means that different people find what makes them stand out from others in order to gain attention from parents or potential mates.

E. Neo-Bussian Evolutionary Theories of Personality

David Buss was the first to formally propose a complete evolutionary theory of personality, but others have followed and made advances to the theory. MacDonald (1995), for example, furthered Buss's theory with two main contributions. First, he tied personality more closely to evolved motivational and emotional systems, and second he argued that the range of personality variation seen on the main dimensions of personality are viable alternative strategies for maximizing fitness. MacDonald, similar to Buss, also tied personality dimensions to evolved strategies for solving adaptive problems.

Similarly, Nettle (2006) recently expanded on evolutionary theories of personality and argued that Tooby and Cosmides's (1990) argument that personality could not be an

adaptation failed to appreciate how environmental change and variability would ultimately select for individual differences in behavior within a given species.

V. Common Misunderstandings in Evolutionary Theory

When evolutionary theory first became popular in the 1980s, it caused quite a bit of controversy. There was a lot of resistance both from inside and outside university settings against applying evolutionary ideas to human thought and behavior.

A. Evolution Implies Genetic Determinism (Behavior as Set in Stone and Void of Influence From the Environment)

Evolution is all about the body changing due to changes in the environment. In this sense, it is inherently a "nature *and* nurture" interaction perspective. Evolution occurs from the interaction between adaptations and input from the environment that triggers the adaptations. More generally, the discovery of epigenetics is an even more powerful example of how genetic influence is not set in stone at the moment of conception and interacts with input from the environment. **Epigenetics** is change in gene function that does not involve changes in DNA (Meaney, 2010; Rutter, 2006).

B. Executing Adaptations Requires Conscious Mechanisms

To say that mechanisms (cognitive and personality) evolved to solve important problems of survival and reproduction does not mean they require complex (conscious) mathematical abilities to operate. "Sexual strategy" is just a shorthand term for a cumbersome idea that evolution has shaped individuals' preferences for mates based on the fact that they are attracted to those who produce healthy and fit offspring and ideally continue to provide for them. This increases the likelihood that they will survive to reproductive age and pass on their healthy genes.

C. Mechanisms Are Optimally Designed

People sometimes draw the conclusion that evolution produces solutions that are optimal. In fact, some adaptations are rather awkward. Evolutionary change occurs over hundreds of generations, and there is always a lag between adaptation and environment. Human preference for fatty and salty foods is a good example. If they were optimally designed, they would be more efficient and respond more quickly to changes in the environment.

VI. Related Research

The evolutionary model of personality cannot be tested directly insofar as one cannot conduct studies over hundreds of generations. And yet, just like in biology, there is much support for the evolutionary basis of human personality, which can be divided into at least three general topics: traits as fitness, genetics, and animal personality. All three lines of evidence support

the view that personality has a biological basis and that these biological systems have evolved.

A. Evolutionary Origins of Personality: Traits as Related to Fitness

A central idea of evolutionary theory is that of fitness, that is, an organism's ability to survive and reproduce. Personality traits exist, according to Buss and other evolutionary psychologists, because they increase an individual's fitness and make him or her more likely to survive and reproduce. There are two related evolutionary explanations for personality traits, both of which relate to fitness. First, as Buss argued, personality traits exist because they solve survival and reproductions problems—that is, they increase the fitness of the individual. Second, they may exist because they were selected, not so much by nature (natural selection), but by other people in the process of choosing a mate (sexual selection).

Research with people in industrialized cultures has found relationships between personality and reproductive success and survival (see Berg, Lummaa, Lahdenperä, Rotkirch, & Jokela, 2014 for a review). Berg and colleagues found that higher agreeableness was associated with having more grandchildren but not having more children. Von Rueden and colleagues in their research found that when controlling for age, sex, and village, physical strength and educational attainment were positively related to prosocial behavior but not to industriousness. They also found that extraversion, agreeableness, conscientiousness, and openness were associated with educational attainment. Researchers have explored the origins of extraversion as it relates to reproductive success (Lukaszewski & Roney, 2011). In their research with university undergraduates, Lukaszweski and Roney found that both physical attractiveness and physical strength related to extraversion in men. In women, only physical attractiveness related to extraversion.

Taken as a whole, these studies support Buss's theory that personality traits are related to, and may be the result of, reproductive and survival success and hence fitness. In short, personality traits have adaptive functions in the course of human evolution.

B. Genetics and Personality

Partly due to how genetics was taught in high school biology, a common assumption many people have is that there is a simple and nearly one-to-one correspondence between genes and traits. There are simple categorical traits (e.g., eye color) that get transmitted by one gene. But all complex psychological traits that are expressed on a continuum from low to high get transmitted by many, many genes. Simply put, **monogenic transmission** happens when single genes produce single traits (phenotypes), and **polygenic transmission** occurs when many genes interact to create a single characteristic (Rutter, 2006).

Researchers use two major methods to examine the relationship among genetics, behavior, and personality. With the first method, the **quantitative trait loci (QTL) approach**, they

look for the location of specific bits of DNA on genes that might be associated with particular behaviors. The second method used by behavioral geneticists for untangling the effects of genetics and environment on personality is the *twin-adoption studies*.

C. Animal Personality

Until the 1990s, most psychologists would have argued that the term *personality* made sense only as applied to humans, but since then numerous studies have supported the notion that nonhuman animals not only have distinct personalities but they have personalities on dimensions similar to the Big Five in humans (Barnard et al., 2016; Dingemanse, Both, Drent, Van Oers, & Van Noordwijk, 2002; Gosling, 1998; Gosling, Kwan, & John, 2003; Rayment, Peters, Marston, & DeGroef, 2016; Suwała, Górecka-Bruzda, Walczak, Ensminger, & Jezierski, 2016; Weinstein, Capitanio, & Gosling, 2008).

In sum, just as eyes, ears, brains, and thermoregulation are evolved solutions and are shared between species and genera of animals, personality traits are shared solutions and found in almost all animals from the invertebrates, fishes, reptiles, birds, and mammals (including primates). The more similar the genus and species, the more similar the system—and this holds for personality.

VII. Critique of Evolutionary Theory of Personality

Evolutionary psychology in general and evolutionary personality psychology in particular have stimulated a lot of controversy but also a relatively *large body of empirical research*. The field has its own scientific society (Human Behavior and Evolutionary Society [HBES]) and its own scientific journal *Evolution and Human Behavior*. The discipline also rests upon other scientific disciplines, such as evolutionary biology, ethology, behavioral genetics, and neuroscience, so there is a solid empirical foundation to the field.

Many critics of evolutionary theory are quick to point out that the central tenets of evolutionary theory are inherently nonfalsifiable and untestable because evolution is a past event and it would take at least thousands of years to observe the outcome of evolution in animals. Moreover, they argue that evolutionary psychology is mostly after the fact (post hoc) explanations for any given phenomenon—in short, evolutionary psychology produces plausible "just-so stories" and many different plausible stories can always be constructed to explain an evolutionary outcome (Gould & Lewontin, 1979; Horgan, 1995).

Defenders of evolutionary theory, for instance, have pointed out that defeating a theory by contrary facts (falsification) is not the only way that science proceeds (Ellis & Ketelaar, 2000; Ketelaar & Ellis, 2000). In terms of how well evolutionary theory of personality *organizes known knowledge*, critics would argue the theory rates quite highly. Evolutionary theory is very broad and long range in its scope, and in that sense, it provides a range of explanations seldom seen in social science. It offers explanations for the ultimate origins of not only all biological systems but human thought, behavior, and personality as well. Evolutionary theory

of personality rates moderate on *internal consistency.* Evolutionary theory of personality scores high on the criterion of *parsimony*.

VIII. Concept of Humanity

It is difficult to say on which side of the *optimism–pessimism* debate evolutionary theory would fall. It is mostly descriptive and, in that sense, tends to be somewhat neutral about describing human nature.

Evolutionary psychology has a complex view on the question of *determinism versus free will*. A common assumption of evolutionary theory by critics is that it is harshly deterministic in that it explains behavior in terms of an evolved past and genetic influence. Indeed, evolutionary psychology is often criticized for condoning traditional sex roles (e.g., women are attracted to high-status men, and men are attracted to physically attractive women). Buss and other evolutionary theorists make clear, however, that evolutionary psychology is a theory of how these traits began, not how they should be.

On the question of *causality versus teleology*, it is clear that evolutionary theory comes down heavily on the causality side of the equation. Evolutionary theory sides more with the *unconscious influences* on thought, behavior, and personality than on conscious ones. The concept of humanity that will be most surprising to many people will be evolutionary psychology's stance on *biological versus social influence*. Clearly, there is a strong emphasis on biological influences, from brain systems, neurochemicals, and genetics. Evolutionary theory is also balanced on the question of the *uniqueness of the individual* compared to general commonality among all people.