

## PSY 102 Reading -- Evolutionary Psychology

The theory of evolution by natural selection was developed by Charles Darwin and forms the core of the field of biology. Without natural selection there is no field named "biology." However, some behavioral scientists also take an evolutionary perspective and focus on how humans' evolutionary history has shaped their mental and emotional nature. These theorists point out that to understand human nature one has to consider the long process through which the human mind and body evolved. Contemporary environments constitute but a blink of an eye in the time span involved for this process. For example, the human species is but a branch of a larger family tree of hominids. The earliest hominid for which we have solid evidence lived 4.4 million years ago. *Homo sapiens* (us) have been around only about 200,000 years, and have engaged in agriculture only during the last 20,000 years. Most of the technology and societal influences in our lives are only hundreds of years old, or even much less.

What does this have to do with psychology? The assumption is that the human brain evolved over millions of years in much the same manner as the human body. Certain traits were adaptive in that possessing those traits put one at an advantage with regard to survival and having offspring. Features that were adaptive were retained and those that were not were often weeded out. Evolutionary theorists agree that to understand how humans think and behave, culture and learning are important, but they point out that both culture and learning are themselves products of human brains. Humans learn certain things more easily than other things, and they create culture to express and attempt to control human nature.

How did the brain, and the human nature it expresses, evolve? The key to answering that question is the process of *natural selection*. The term "natural" refers to the assumption that there was no divine being that fashioned humans into the ideal form. So, what evolved was not predestined nor did it result from any conscious act. The way we are today is a result of a gradual process of selection that occurred over those millions of years up to this point. Characteristics that were adaptive, that resulted in individuals being more likely to survive and have offspring, were more likely to be represented in subsequent generations. Why? Because the people who were most likely to survive and have offspring had more opportunities to pass on the genes responsible for those characteristics, even if the characteristics were far from being passed on with 100% certainty. Given enough time, everyone in the species would share certain characteristics because they were adaptive during the long period of evolutionary development.

### *An Illustration with Food*

Consider a fairly simple preference for certain tastes in the foods we eat. Why do we prefer a fresh, moist cookie to a fresh, moist pile of feces? Seems like a ridiculous question because we are disgusted by the thought of eating feces. However, flies and dung beetles are attracted to feces the way humans are attracted to cookies. Why the difference? Humans, flies, and dung beetles evolved to possess different taste mechanisms (preferences). So, certain substances just naturally taste good to us whereas other substances just naturally taste good to members of other species. Salty, sugary, and fatty foods naturally taste good to us, and no one has to teach infants to find these tastes appealing (can you imagine having to talk a child into eating candy or french fries?).

To illustrate how our current taste mechanisms may have evolved, imagine an early group of our very distant ancestors. In this early group there was a great deal of natural variation in the taste preferences of the members. Some people were born naturally liking bitter tasting substances, others were born naturally preferring sour tasting things, and so forth. Now imagine what each type of individual was likely to eat. The individuals preferring bitter or sour tastes might have eaten rotten fruit, dirt, tree bark, and perhaps even feces (who knows what feces tastes like?). The individuals in the group who preferred sweet tastes were probably more likely to avoid these substances and instead eat ripe fruit. Which type of individual was probably most likely to maintain his or her health and live the longest? Because we all share the preferences for salty, sugary, and fatty foods, we can be confident that our distant ancestors had these preferences as well, even though they probably knew nothing about nutrition. In fact, these preferences are shared among mammals.

This example of inherited taste preferences also illustrates some aspects of evolutionary theory that are often overlooked. Notice that the traits that we inherited evolved over a very long span of time during which those traits were adaptive. However, our current environments have changed so quickly that what was once adaptive may now be maladaptive (harmful). The taste mechanisms evolved during a long period in which salty, fatty, and sugary foods were relatively scarce, and individuals were very physically active. So, to indulge in these foods whenever they were encountered was probably adaptive. Now we live in a culture in which we have easy access to fatty, sugary, and salty foods, and most of us lead fairly inactive lives. The result is often obesity, heart disease, diabetes, tooth

decay, and other conditions that are clearly maladaptive.

Another key point illustrated in our taste mechanisms example is that culture is both shaped by our inherited preferences and shapes those preferences. Fast-food restaurants and snack foods are clearly part of Western culture. What do all fast-food restaurants and snack foods have in common? All are salty, sugary, and/or fatty. We recognize that too much of these foods is bad for us, and sometimes fast-food restaurants and snack foods are blamed for obesity and other physical problems that are prevalent today. However, which came first, our taste mechanisms or fast-food restaurants and snack foods? It seems obvious that these aspects of our culture arose to exploit our inherent preferences for certain types of food, and that fast-food restaurants did not create our preferences for salt, sugar, and fat.

Notice also that taste preferences are malleable. Culture can exert a strong influence. If you like the taste of beer or grapefruit, you have overridden the inherent tendency to find the taste of these substances unappealing. Certainly across cultures there are differences in the preferred foods, so learning and exposure are important influences on our taste preferences. Evolutionary theorists would point out, however, that the underlying inherited preferences will determine the path of least resistance and the boundaries within which culture can exert an influence. So, it will always be easier to sell a hamburger than a pile of feces with a side order of tree bark.

Getting back to psychology, evolutionary theorists base their work on the assumption that the human brain evolved to contain certain "software" that makes particular judgments, or learning, or behavior more likely than others. It may be helpful to think of a personal computer. Imagine getting a really good deal on a new computer with tons of memory and a huge hard drive. Obviously such a computer holds a lot of potential. However, you are discouraged to learn that the reason the computer was so cheap was because it does not come with any software, not even a version of windows! What can you do with such a computer? The answer is "nothing," unless you load some software. It is the software that allows input, coming from outside the computer, to be used inside the computer. The software tells the computer what a particular key stroke "means" or what a particular click of the mouse "means." Without such instructions, input from outside is meaningless.

Evolutionary psychologists say that what we have inherited from our distant ancestors is a powerful set of cognitive software that allows us, as humans, to make sense out of incoming stimuli, which allows us to learn. That cognitive software makes certain preference more likely than others, and leads us to learn certain things more easily or quickly than other things. Why? Because those tendencies were adaptive in the past, so ancestors who had such software were more likely to survive and have offspring, thereby passing on their cognitive programs.

This evolutionary view rests on the notion that we do not come into the world an entirely blank slate (much like an empty hard drive). Instead, we come pre-loaded with certain cognitive software. The result is that there are certain preferences, biases, and behaviors that are universal. These are said to comprise our *human nature*. Of course that does not mean that everyone will respond or behave precisely the same way because circumstances differ, and the cognitive software is often very sensitive to input from the environment. To take a concrete example, consider language. Linguists have demonstrated that human language is too complex to learn in the first two years of life if languages were arbitrary and youngsters learned through trial-and-error or being rewarded for learning. Instead, it is well accepted that we come into the world with cognitive software that makes it much easier to learn language, as long as that language is based on a certain deep structure that matches our cognitive software. So, all human languages end up sharing that deep structure, because without it infants would be unable to learn it. Notice that this cognitive software does not determine *what* language we learn--that results from where we are born and what is spoken in our immediate environment. In the end, the language we speak (a behavior) is the result of the *interaction* between the cognitive software we inherited from our distant ancestors and the environment in which we're raised.

Throughout the semester we will be exploring various aspects of human nature, and often it will be useful to consider why we have these mental features. From an evolutionary perspective, the answer is that they must have aided in survival and reproduction for our distant ancestors who possessed those mental features (well, actually, the cognitive software responsible for those mental features).