

ELEMENTS OF CHANGE

1. EVOLUTIONARY PSYCHOLOGY

1.1. Scope

Evolutionary Psychology (EP) is an approach in the social and natural sciences that examines psychological traits such as memory, perception, and language from a modern evolutionary perspective. It seeks to identify which human psychological traits are evolved adaptations that is, the functional products of natural selection or sexual selection. Adaptationist thinking about physiological mechanisms, such as the heart, lungs, and immune system, is common in evolutionary biology. Some evolutionary psychologists apply the same thinking to psychology, arguing that the mind has a modular structure similar to that of the body, with different modular adaptations serving different functions. Evolutionary psychologists argue that much of human behavior is the output of psychological adaptations that evolved to solve recurrent problems in human ancestral environments.

The adaptationist approach is steadily increasing as an influence in the general field of psychology. Evolutionary psychologists suggest that EP is not simply a subdiscipline of psychology, but that evolutionary theory can provide a foundational, metatheoretical framework that integrates the entire field of psychology, in the same way it has for biology. Evolutionary psychologists hold that behaviors or traits that occur universally in all cultures are good candidates for evolutionary adaptations. The theories and findings of EP have applications in many fields, including economics, environment, health, law, management, psychiatry, politics, and literature. Controversies concerning EP involve questions of testability, cognitive and evolutionary assumptions (such as modular functioning of the brain, and large uncertainty about the ancestral environment), importance of non-genetic and non-adaptive explanations, as well as political and ethical issues due to interpretations of research results.

Evolutionary psychology is also considered an approach that views human nature as the product of a universal set of evolved psychological adaptations to recurring problems in the ancestral environment. Proponents of EP suggest that it seeks to integrate psychology into the other natural sciences, rooting it in the organizing theory of biology (evolutionary theory), and thus understanding psychology as a branch of biology. Just as human physiology and evolutionary physiology have

worked to identify physical adaptations of the body that represent human physiological nature, the purpose of evolutionary psychology is to identify evolved emotional and cognitive adaptations that represent human psychological nature. Evolutionary psychology adopts an understanding of the mind that is based on the computational theory of mind. It describes mental processes as computational operations, so that, for example, a fear response is described as arising from a neurological computation that inputs the perceptual data, for example, a visual image of a spider, and outputs the appropriate reaction, like fear of possibly dangerous animals.

While philosophers have generally considered the human mind to include broad faculties, such as reason and lust, evolutionary psychologists describe evolved psychological mechanisms as narrowly focused to deal with specific issues, such as catching cheaters or choosing mates. EP views the human brain as comprising many functional mechanisms, called psychological adaptations or evolved cognitive mechanisms or cognitive modules, designed by the process of natural selection. Evolutionary psychology focuses primarily on the "why?" questions, while traditional psychology focuses on the "how?" questions.

1.2. Theoretical Foundations & Premises

Evolutionary psychology is founded on several core premises. The representative statements below represent the core thoughts:

1. The brain is an information processing device, and it produces behavior in response to external and internal inputs.
2. The brain's adaptive mechanisms were shaped by natural and sexual selection.
3. Different neural mechanisms are specialized for solving problems in humanity's evolutionary past.
4. The brain has evolved specialized neural mechanisms that were designed for solving problems that recurred over deep evolutionary time, giving modern humans stone-age minds.
5. Most contents and processes of the brain are unconscious and most mental problems that seem easy to solve are actually extremely difficult problems that are solved unconsciously by complicated neural mechanisms.
6. Human psychology consists of many specialized mechanisms, each sensitive to different classes of information or inputs. These mechanisms combine to produce manifest behavior.

The theories on which evolutionary psychology is based originated with Charles Darwin's work, including his speculations about the evolutionary origins of social instincts in humans. Modern evolutionary psychology, however, is possible only because of advances in evolutionary theory in the 20th century. Evolutionary psychologists say that natural selection has provided humans with many psychological adaptations, in much the same way that it generated humans' anatomical and physiological adaptations. As with adaptations in general, psychological adaptations are said to be specialized for the environment in which an organism evolved, the environment of evolutionary adaptedness, or EEA. Sexual selection provides organisms with adaptations related to mating. For male mammals, which have a relatively high maximal potential reproduction rate, sexual selection leads to adaptations that help them compete for females. For female mammals, with a relatively low maximal potential reproduction rate, sexual selection leads to choosiness, which helps females select higher quality mates. Charles Darwin described both natural selection and sexual selection, and he relied on group selection to explain the evolution of altruistic, self-sacrificing behavior. But group selection was considered a weak explanation, because in any group the less altruistic individuals will be more likely to survive, and the group will become less self-sacrificing as a whole.

1.3. Major Areas of Research

Foundational areas of research in evolutionary psychology can be divided into broad categories of adaptive problems that arise from the theory of evolution itself: survival, mating, parenting, family and kinship, interactions with non-kin, and cultural evolution. The following areas of research are presented here in depth; survival and individual level psychological adaptations, consciousness, and personality.

Survival and individual level psychological adaptations - Problems of survival are thus clear targets for the evolution of physical and psychological adaptations. Major problems the ancestors of present day humans faced included food selection and acquisition; territory selection and physical shelter; and avoiding predators and other environmental threats.

Consciousness - The concept of consciousness can refer to voluntary action, awareness, or wakefulness. However, even voluntary behavior involves unconscious mechanisms. Many cognitive processes take place in the cognitive unconscious, unavailable to conscious awareness. Some behaviors are conscious when learned but then become unconscious, seemingly automatic. Learning, especially implicitly learning a skill, can take place outside of consciousness. For example, plenty of people know how to turn right when they ride a bike, but very few can accurately explain how they actually do so. Evolutionary psychology approaches self-deception as an adaptation that can improve one's results in social exchanges.

Personality - Evolutionary psychology is primarily interested in finding commonalities between people, or basic human psychological nature. From an evolutionary perspective, the fact that people have fundamental differences in personality traits initially presents something of a puzzle. Personality traits are conceptualized by evolutionary psychologists as due to normal variation around an optimum, due to frequency-dependent selection (behavioral polymorphisms), or as facultative adaptations. Like variability in height, some personality traits may simply reflect inter-individual variability around a general optimum. Or, personality traits may represent different genetically predisposed behavioral morphs, alternate behavioral strategies that depend on the frequency of competing behavioral strategies in the population. Finally, like many other psychological adaptations, personality traits may be facultative sensitive to typical variations in the social environment, especially during early development. For example, later born children are more likely than first borns to be rebellious, less conscientious and more open to new experiences, which may be advantageous to them given their particular niche in family structure.

1.4. Products of Evolution

Not all traits of organisms are adaptations. As noted in the table below, traits may also be exaptations, byproducts of adaptations, or random variation between individuals. Psychological adaptations are hypothesized to be innate or relatively easy to learn, and to manifest in cultures worldwide. For example, the ability of toddlers to learn a language with virtually no training is likely to be a psychological adaptation. On the other hand, ancestral humans did not read or write, thus today, learning to read and write require extensive training, and presumably represent byproducts of cognitive processing that use psychological adaptations designed for other functions. However, variations in manifest behavior

can result from universal mechanisms interacting with different local environments. For example, Caucasians who move from a northern climate to the equator will have darker skin. The mechanisms regulating their pigmentation do not change; rather the input to the those mechanisms change, resulting in different output.

Table- Products of Evolution: Adaptations, Exaptations, Byproducts, and Random Variation

	Adaptation	Exaptation	By-Product	Random Variation
Definition	Organismic trait designed to solve an ancestral problem(s). Shows complexity, special "design", functionality	Adaptation that has been "re-purposed" to solve a different adaptive problem.	Byproduct of an adaptive mechanism with no current or ancestral function	Random variations in an adaptation or byproduct
Physiological Example	Bones / Umbilical cord	Small bones of the inner ear	White color of bones / Belly button	Bumps on the skull, convex or concave belly button shape
Psychological Example	Toddlers' ability to learn to talk with minimal instruction.	Voluntary Attention	Ability to learn to read and write.	Within-sex variations in voice pitch.

One of the tasks of evolutionary psychology is to identify which psychological traits are likely to be adaptations, byproducts or random variation. George C. Williams suggested that an adaptation is a special and onerous concept that should only be used where it is really necessary. As noted by Williams and others, adaptations can be identified by their improbable complexity, species universality, and adaptive functionality.