

Evolutionary Psychology: Objections and Replies

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Abstract

Evolutionary psychology is the study of human cognitive structures and the resultant behaviors in the light of evolutionary theory. The methodology, results and very existence of evolutionary psychology have been objected to on both ethical and scientific grounds. This essay attempts to address some of the most important objections to evolutionary psychology and show them to be either of legitimate concern or simply mistaken. No objections are found to be defeaters for evolutionary psychology.

1. Introduction

A maelstrom of controversy has followed research into the biological and evolutionary basis of human behavior for decades. The current incarnation of the debate is whether or not evolutionary psychology is, or can be, a successful research program. Success can be measured in many ways, but for the purposes of this paper, evolutionary psychology will be analyzed in terms of its ethical and scientific status. Ethical objections may be taken in the form of 'Should we have an evolutionary psychology?' and scientific objections as 'Can we have a scientific evolutionary psychology?' Before criticizing them, the claims of evolutionary psychology must be made clear.

2. What is Evolutionary Psychology?

Evolutionary psychology, simply put, is "psychology that is informed by the additional knowledge that evolutionary biology has to offer, in the expectation that understanding the process that designed the human mind will advance the discovery of its architecture" (Barkow, Cosmides and Tooby). Evolutionary psychologists take an adaptationist stance toward psychology-- that is, they study psychological "adaptations, byproducts of adaptations, and malfunctions of adaptations" and the behaviors generated from them (Hagen). However, they do not tend to address adaptive behavior and socially adaptive behavior, which is in the realm of Sociobiology. Applied to the human body in the less

controversial discipline of evolutionary medicine, the adaptationist approach has been helpful in explaining and treating many illnesses. Applied to the brain it is no less informative, so claim evolutionary psychologists.

The commitments made (or premises accepted) by evolutionary psychologists are well summarized by Leda Cosmides and John Tooby in "Evolutionary Psychology: A Primer":

Principle 1. The brain is a physical system. It functions as a computer. Its circuits are designed to generate behavior that is appropriate to your environmental circumstances...

Principle 2. Our neural circuits were designed by natural selection to solve problems that our ancestors faced during our species' evolutionary history...

Principle 3. Consciousness is just the tip of the iceberg; most of what goes on in your mind is hidden from you. As a result, your conscious experience can mislead you into thinking that our circuitry is simpler than it really is. Most problems that you experience as easy to solve are very difficult to solve -- they require very complicated neural circuitry...

Principle 4. Different neural circuits are specialized for solving different adaptive problems...

Principle 5. Our modern skulls house a stone age mind. (Cosmides & Tooby, a)

Scientific critics of evolutionary psychology reject one or more of the principles of evolutionary psychology. Most critics object to parts of principle 1 (such as Searle) and most, if not all, of principles 2, 4 and 5 (such as Gould, Lewontin and Rose). The ethical criticisms of evolutionary psychology are not particular to the principles of evolutionary psychology. Rather, they are about the conclusions and uses of evolutionary psychology.

3. Ethical Criticisms of Evolutionary Psychology

Should we have an evolutionary psychology? Like Sociobiology before it, evolutionary psychology has been accused of being racist, sexist, socially Darwinistic and genetically deterministic. Some see evolutionary psychology as an apologetic for different prejudices and social practices, others fear it facilitates moral exculpation. Therefore, they argue, evolutionary psychology should not be considered a legitimate science anymore than we consider social Darwinism a legitimate sociological theory. These objections, however, are based upon faulty reasoning.

Accusations of racism have followed evolutionary explanations that have been applied to humans ever since the unfortunate advent of social Darwinism and the eugenics movement. Some see evolutionary psychology as old wine in a new bottle: "Followers of some older hereditarian and race-based theories now call themselves 'evolutionary psychologists' to seem up to date, just as parts of the French right and British National Front embraced sociobiology" (Dusek). Furthermore, it has been accused that "the centrally sexist claims of sociobiology [such as unflattering, inherent differences] remain in evolutionary psychology, presented in more neutral, theoretical mode of expression" (Dusek). The acceptance of evolutionary psychology, in this view, is either tantamount

to the endorsement of morally objectionable practices or too dangerous because so many falsely derive justifications for objectionable doctrines.

Today, there is widespread recognition of the scientific inadequacy of the concept of race among evolutionary psychologists, biologists and other scientists (Cosmides & Tooby, a; Hagen). Evolutionary psychologists are, generally, more interested in human universals than human differences, and, as their principles suggest, support the idea that there is a fairly uniform human nature (Cosmides & Tooby, a; Hagen). Evolutionary psychologists also argue that there are innate cognitive differences between the sexes, and hierarchies are prevalent in nature and our own evolutionary past (Hagen). Presumably, evolutionary psychologists have good scientific reasons for coming to these conclusions. However, this consensus is irrelevant to the deeper problem with accepting or rejecting the above conclusions based upon moral reasons. Such a leap from the way things are to the way things should be is fallacious.

The naturalistic fallacy is based upon a distinction made by Hume centuries ago between use of the word "is" and the use of "ought". If, for instance, a genetic basis for homosexuality were found, the debate about the moral nature of homosexuality would be relatively unaffected, unless one succumbs to the naturalistic fallacy. That there are homosexuals demonstrates that there are sufficient conditions for their existence; establishing the causal story behind homosexuality allows us to take account of the factors behind their existence, that is, they tell us what "is" the case. Establishing the moral or ethical importance of being homosexual is dependent on further considerations of the "ought" kind. To suppose that something ought to be the case merely because it is the case is a mistake. Scientific findings cannot be used as a foundation for a moral framework without succumbing to the naturalistic fallacy, because "[e]volutionary psychology is not a moral framework! It is a framework for understanding human nature" (Hagen). Admittedly, people often fall prey to the naturalistic fallacy (as do they to many other fallacies). This does not imply that we should not have an evolutionary psychology, rather this implies that people should be more informed about the naturalistic fallacy by evolutionary psychologists.

The accusation of genetic determinism is another hotly (and often fruitlessly) debated topic among proponents and critics of evolutionary psychology. According to some critics, "[f]or psychologists, the gene-to-behavior bait is especially tempting, because connect-the-dots atomicity and determinism makes cognitive science easy (Ahouse & Berwick, a). This simplistic genetic determinism, it is argued, leads to a loss of responsibility and the idea of free will, because we are merely slaves to our genes.

Neither natural selection nor genes directly cause behavior: "Naturally selected genes can only design the generator of behavior: the package of neural information-processing and goal-pursuing mechanisms called the mind." The mind, of course, works in an environment, however the "Genes allow the environment to influence the development of phenotypes" by producing organs that change in response to it (Cosmides and Tooby, a). In short, humans make moral (and other) decisions; genes do not, though they enable us to make decisions. For instance, TV sets have a highly determined structure (much more

so than ours) yet you can watch a virtually limitless number of different TV shows on it. Nothing about its highly determined nature prevents it from presenting diverse broadcasts and videos. Rather, its precisely specified structure enables it to do what it does. Similarly, the specified structure of the brain allows the wealth of behaviors evident in humanity (Hagen).

Even if the causal process between genes, environment and behavior becomes transparent, such concerns, it has been argued, are ill founded (Dennett, 1990). Causal determinants are not, unless they originate in another agent, controllers. Genes and the environment are not agents who control us; they are the means through which we become predictors and goal setters-- thus allowing us to be moral agents. Without the causal determination following from our own actions, they would be ineffectual and thus not ethically viable. If there were no necessary consequences of ones actions, then no guiding principles could be used ethically, because ones actions are only loosely associated (if at all) with moral consequences.

4. Scientific Criticisms of Evolutionary Psychology

Can we have a scientific evolutionary psychology? Are there good scientific reasons to accept evolutionary psychology? The most serious charge against evolutionary psychology is that it is unfalsifiable and therefore, unscientific. There are three interrelated arguments against evolutionary psychology being scientifically viable: 1) there is no non-arbitrary way to identify adaptations, 2) adaptive claims are established upon the basis of an unfalsifiable evolutionary era of adaptedness (EEA) and 3) evolutionary psychology is irredeemably simplistic in its genic reductionism.

Evolutionary psychologists strive to identify mental adaptations, but if they cannot identify these adaptations and differentiate them from nonadaptations, there is no way to have a legitimate science of evolutionary psychology. Instead of being an adaptation, something may be a neutral feature or a spandrel (a byproduct of adaptation). Some critics claim that not only is it impossible to distinguish between adaptations and non-adaptations, but when one adaptationist account fails, another can always be substituted (making them vacuous).

Contrary to the critics, "specific adaptationist proposals are testable in principle and in practice (Pinker, d). Serious evolutionary psychologists do not rule out "byproducts, and features present through neutral drift or chance, along with other determinants of evolutionary outcomes" (Cosmides & Tooby, b). Rather than despair at the plurality of alternatives, evolutionary psychologists seek a way to differentiate between them. As a matter of fact, non-arbitrary means of identifying adaptations have been proposed (Williams, 1966). Williams proposed criterion includes reliability in the development of the trait or structure, metabolic (and other) economy in the solution to an adaptive problem and efficiency in the solution of an adaptive problem. Moreover, a way of differentiating selected traits from ones that are not have been suggested (Pinker, 1997). Bordering on a complexity theoretic summation, Pinker suggests that the structure must be heterogeneous and be unified for a particular function; if "you can't state the function

more economically than you can describe the structure, then you don't have design" (Pinker, 1997). The smaller the probability of a structure coming about randomly, the higher the likelihood of it being specified complexity--that is, a structure that is selected for based upon its being adaptive. Ironically, similar considerations have been used by intelligent design theorists to revive the argument from design. So far, it seems they have been successful at producing a mathematical means of detecting adaptive complexity (Edis).

Adaptive explanations have been labeled as "just-so stories" because "the chief strategy proposed by evolutionary psychologists for identifying adaptation is untestable, and therefore unscientific" (Gould, b). Just-so stories are ad hoc, often ridiculous explanations for observed phenomena; for instance, one may say that our noses were designed to hold glasses up. As Gould sees it, use of the EEA is an ad hoc rationalization for nonadaptation (Gould, b).

It is ironic that one of the foremost critics of using the historical period of our evolutionary development as the basis of adaptive explanations is a paleontologist. True, the human EEA is difficult to gain a detailed understanding of, as are other eras of prehistory, but such knowledge is not impossible. The disciplines of paleoanthropology and archeology help us to reconstruct the environment in which humanity has evolved using empirical evidence. The critics evoke doubts about these disciplines by raising the bar of knowledge so high they cannot pass over it. Any reasonable historical discipline is constrained by the quality and quantity of the clues left for them to use, but this does not make them unscientific, just difficult to verify. As in any scientific theory, ad hoc moves can be made to save an imperiled theory in evolutionary psychology. Such moves may be exposed by asking whether or not the evidence favors the new explanation and looking for risky test consequences of the theory. Moreover, "for any living species, most aspects of its EEA will correspond closely to aspects of its present environment, otherwise it would go extinct; if the present environment of any organism differs too much from its EEA, its functions will most probably fail to ensure survival and reproduction" (Hagen).

Even relatively minor facts about the EEA can yield fruitful theories: we also know that women got pregnant and men didn't (the foundation for much research on mating strategies in both humans and other animals). Additionally, differential parental investment theories are based on a series of noncontroversial facts: population densities were much lower than today; most societies were very probably kin-based; child mortality rates were very probably much higher than today; humans still took more than a dozen years to reach sexual maturity; and fathers were less certain of paternity than mothers were of maternity.

The last major objection to evolutionary psychology was inherited from evolutionary biology: the controversy over genic reductionism and levels of selection. Genic reductionism is the stance that the "units of selection" are genes. Opponents of this view argue that either selection does not act on genes or not just on genes. Often highly historical, contingent contributions to the evolution of organisms are emphasized by critics of genic reductionism. Because evolutionary psychology relies upon various

forms of genic reductionism, it stands or falls on the success of genic reductionism (Wilkins, b).

Genic reductionism is the result of taking the Modern Synthesis of genetics and evolution and using the recently developed techniques of Game Theory to model changes in populations. Units of fitness are necessary for these models. The gene is the unit of selection according to the reductionists because it replicates and carries biological information (Wilkins, b). Group-level selection has been shown to occur in rare, mathematically established circumstances, which, argue the reductionists, makes it an exception and not the rule. Furthermore, morphological considerations, historical contingencies and the like act as constraints on the selection process and noise in the signal of biological information replicating. As background radiation does not preclude the identification of radiation from a source, contingent "noise" in our genetic information does not exclude the possibility of isolating the signal with idealizing assumptions. And, finally, genic reductionism and its offshoots (reciprocal altruism, kin selection and sexual selection) have been spectacularly useful in the explanation and prediction of biological traits such as "free rider" genes and the preferential helping of kin in proportion to relatedness and reproductive potential.

5. Problems with Evolutionary Psychology: A Case Study

A case study might be effective in illustrating the relative success and failure of evolutionary explanations of the psychological. Leda Cosmides and John Tooby have researched deeply into reasoning about social contracts and have found some startling results that were anticipated by their theory.

Adaptationist reasoning led Cosmides and Tooby to hypothesize that the evolved architecture of the human mind would include inference procedures that are specialized for detecting cheaters in social exchanges. To test this hypothesis, they used an experimental paradigm called the Wason selection task. The Wason task is, essentially, a test of logical reasoning. In this task, the subject is asked to look for violations of a conditional rule of the form If P then Q. To successfully test (falsify) this rule one must look for conditions that fulfill P and not Q. For instance, "If a person goes into Boston, then that person takes the subway" may be tested by looking for instances of going to Boston without taking the subway (Tooby & Cosmides, a).

If the human mind develops to detect logical violations of conditional rules, the answer would be obvious. However, fewer than 25% of subjects spontaneously make the correct response and even formal training in logical reasoning does little to boost performance on descriptive rules of this kind. Many tests have shown that people are not very good at detecting logical violations of if-then rules in Wason selection tasks, even when these rules deal with familiar content drawn from everyday life. However, people who ordinarily cannot detect violations of if-then rules can do so easily and accurately when that violation represents cheating in a situation of social exchange. This is a situation in which one is entitled to a benefit only if one has fulfilled a requirement (e.g., more generally, "If you take benefit B, then you must satisfy requirement R"). Cheating is

accepting the benefit specified without satisfying the condition that provision of that benefit was made contingent upon (Tooby & Cosmides, a).

When asked to look for violations of social contracts of this kind, the adaptively correct answer is immediately obvious to almost all subjects. Whenever the content of a problem asks subjects to look for cheaters in a social exchange subjects find the problem simple and, in general, 65-80% of subjects get it right. The results obtained cross culturally (in adults in the US, UK, Germany, Italy, France, Hong-Kong; schoolchildren in Ecuador, Shiwiar hunter-horticulturalists in the Ecuadorian Amazon), and even when the situation described is culturally unfamiliar and even bizarre. Moreover, "the procedures activated by social contract rules do not behave as if they were designed to detect logical violations per se; instead, they prompt choices that track what would be useful for detecting cheaters, whether or not this happens to correspond to the logically correct selections": the adaptively correct response if one is looking for cheaters -- no matter what logical category they correspond to (Tooby & Cosmides, a).

The predictions based on adaptationist reasoning about the value of cheater detection is clearly not arbitrary; cheater detection among social animals such as ourselves has clear adaptive value i.e. identifying a cheater and not investing in a nonreciprocator, thus minimizing losses through social interactions. Despite the risky test predictions posed by Cosmides and Tooby, the evidence to a certain extent underdetermines the theory. Underdetermination is not necessarily fatal to theories (if they were, no theory would survive), but it does place a burden of proof upon theorizers. Cosmides and Tooby are well aware of this and respond by doing tests to disconfirm alternate hypotheses that explain the effects they found. Further tests to establish the universality of the effect and to identify the specialized structures involved with detecting cheaters in social exchanges would lend further support to their theory. The objections to evolutionary psychology do not find purchase with this particular theory. It is not clear how this result is ethically important, and the scientific objections are met to a large degree. That cheater detection is an adaptation and was a problem in the EEA is fairly certain. Perhaps its biggest obstacle is in directly establishing the genetic basis for cheater detection, rather than indirectly supporting it through its universality in humans (which, possibly could be explained by other means).

6. Conclusion

Often much heat and little light is produced by the debates about evolutionary psychology. Through the rhetoric and ire of these debates legitimate concerns about the ethical and scientific status of evolutionary psychology may be discerned. How should we present theories in evolutionary psychology? Need we be more careful about the naturalistic fallacy? How may we identify adaptations nonarbitrarily? How may we avoid ad hoc explanations? How may we avoid too many idealizing assumptions? While these concerns are legitimate, they are not defeaters. Rather they serve to remind evolutionary psychologists of the potential problems with their mode of explanation. Such reminders are welcome in the development of evolutionary psychology as a legitimate science.

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