

# EVOLUTIONARY PSYCHOLOGY

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## Introduction

Evolutionary psychology is a research program in the social sciences that explains human behavior in terms of evolved mechanisms that underlie the relevant behavior. Evolutionary psychologists aim to account for a large range of human behavior in this way, ranging from the choice of sexual partners, parenting and violent conflict between individuals to social organization, cultural practices and the production and use of artifacts. Evolutionary psychologists present their approach as a necessary one for the social and behavioral sciences and often support the stronger view that their approach should supplant other social science research programs (cf. Rosenberg 1980 on sociobiology).

Clark Barrett, in his recent systematic presentation and defense of evolutionary psychology, says “There are few things more obvious than the fact that we are products of evolution” (2015, 1). He goes on to say that despite the fact that all modern-day scientists agree with this statement, in the social sciences “there are few things a scientist can do to generate more controversy than to make a claim that [a given] feature of human thought or behavior is the product of evolution” (ibid.). The evidence for this is the “barrage of criticism that is directed at the field of evolutionary psychology” (ibid.). In his view, as evolutionary psychology has become more visible and grown in stature, controversy about it has increased.

Debates about evolutionary psychology range from local and focused discussions about evolutionary theory to wider-scope discussions about culture and politics. Evolutionary psychologists have fielded criticism from cultural anthropologists, evolutionary anthropologists, evolutionary biologists, philosophers (including feminist philosophers, philosophers of biology and philosophers of mind), psychologists, and sociologists. In philosophy there are several books whose main focus is criticizing evolutionary psychology and associated approaches to explaining human behavior (see e.g. Barker 2015; Buller 2005; Dupre 2001; Prinz 2012; Richardson 2007). Some critics object to the idea that human behavior and culture are amenable to evolutionary explanation, but this line of criticism does not capture all dimensions of debates about evolutionary psychology. Evolutionary anthropologists are also in the business of providing evolutionary

explanations of human behavior and culture, yet they are among the sharpest critics of evolutionary psychology (see e.g. S. Hrdy 1999). In what follows we review the key issues in some of the different debates about evolutionary psychology. First, we briefly introduce the evolutionary psychologists' research program.

### Evolutionary Psychology's Research Program

Evolutionary psychology is an outgrowth of sociobiology (cf. Griffiths 2006, 2011). Sociobiologists argued that human nature should be accounted for in evolutionary terms (see e.g. Wilson 1978). On this view, our nature, expressed in universal human behaviors and cultural practices, is a product of our genes. The reason the traits making up our nature are universal is that the genes underlying these traits have been fixed in the population by natural selection. In contrast with sociobiologists, evolutionary psychologists change the locus of explanation from genes to psychological mechanisms. On this view, human nature, again expressed in our universal behaviors and cultural practices, is best understood as a collection of evolved psychological mechanisms (Cosmides, Tooby, and Barkow 1992; Tooby and Cosmides 1990, 2005). These evolved psychological mechanisms are specialized. Evolutionary psychologists argue that we see all manner of specialized morphological traits that adapt us to specific features of our environment—livers remove toxins and lungs oxygenate the blood—and we should expect to see analogous differentiation in our psychological mechanisms (see e.g. Barrett 2015; Confer et al. 2010). Evolutionary psychologists resist the idea that what makes humans successful is a highly flexible mind that is a general processor. They argue that such a general processor is highly unlikely to be the product of an evolutionary process that allowed us to adapt to survive multiple distinct environmental challenges. Rather, evolution produces many special-purpose mechanisms that fit with specific aspects of the world (Barrett 2015; Confer et al. 2010). As Barrett puts it “There are many ways in which the mind is ‘fitted,’ or shaped, to the world in which it operates, and all aspects of mind-world fit must, ultimately, be the result of the evolutionary process” (2015, 7). Our flexibility is the result of many specialized mechanisms acting in concert rather than the result of one undifferentiated general-purpose mechanism.

Evolutionary psychologists test their hypotheses using methods shared with other psychologists, including observational techniques, questionnaires, and neural imaging. They also use methods not shared with other psychologists. For example, they borrow from archaeology, comparative biology, ethnography, and paleontology (cf. Confer et al. 2010, 112). Evolutionary psychologists widen the scope of hypothesis-testing methods because they have the double burden of testing both psychological and evolutionary hypotheses. Evolutionary hypotheses are claims about the evolutionary process that led to the representation of a given trait in a population. Such hypotheses cannot be tested by simply establishing the prevalence of the trait in a population or by establishing that some individuals have an underlying mechanism that reliably produces the relevant trait. Barrett emphasizes that evolutionary psychology must be guided by the logic and research methods of evolutionary biology if it is to live up to its name (2015, 12).

Throughout the 1990s evolutionary psychologists proposed a huge number of evolved psychological mechanisms. Such mechanisms were proposed to explain all manner of social phenomena and human behavior, including selection of mates, the institution of marriage, the prevalence of murder of stepchildren, incest taboos, and differential parental investment in male or female offspring. In the last ten years many in the field have required higher standards of

test for proposed evolved psychological mechanisms (cf. Barrett 2015; Confer et al. 2010). As a result, fewer mechanisms are defended. Some argue that many hypotheses about evolved psychological mechanisms have been straightforwardly falsified (see e.g. Confer et al. 2010). For some time Devendra Singh's (1993; Singh and Luis 1995) hypothesis that men had an evolved mechanism for detecting optimal waist/hip ratios in women was presented as a textbook case of an evolved psychological mechanism. Now this specific hypothesis about women's waist/hip ratios has come under severe critical scrutiny as a result of conflicting empirical findings (see e.g. Yu and Shepard 1998). However, there is lots of interesting work on why there is variation in women's waist/hip ratios within and between cultures that does not invoke optimal waist/hip ratio detection mechanisms in men (see e.g. Cashdan 2008). The evolutionary psychology hypotheses that men have an evolved preference for virgins and that male homosexuals persist in human populations because of kin altruism have also both been falsified (cf. Confer et al. 2010).

Barrett claims that our theory of mind module is a classic example of an "evolved psychological adaptation" (2015, 211). On the dominant view in cognitive science, our ability to attribute beliefs to others and to interpret their behavior via these belief attributions results from an underlying psychological mechanism, our theory of mind, that "comes online" at a specific time during development. Cognitive psychologists refer to our interpretive capacity as "mindreading" (see Nichols and Stich 2003 for a clear presentation of this literature). Barrett presents a large amount of work that supports the hypothesis that mindreading is "an evolved capacity" (Barrett 2015, 153). Other evolutionary psychology hypotheses that have strong support include: evolved fear mechanisms underlying our avoidance of snakes and spiders; evolved mechanisms for avoiding toxic foods; and evolved social exchange cheat detection mechanisms (Barrett 2015; Confer et al. 2010). As we shall see, while some critics of evolutionary psychology focus on hypotheses that evolutionary psychologists agree lack support, others focus on hypotheses that evolutionary psychologists take to be well supported. We now turn to debates about evolutionary psychology.

### Debates about Evolutionary Psychology

Evolutionary psychology's predecessor, human sociobiology, was attacked on several fronts. Biologists and philosophers of biology argued that human sociobiologists did not practice biology as rigorously as their counterparts in animal behavioral biology. Critics also argued that sociobiologists were guided by a narrow view of evolutionary theory, referred to as adaptationism, and that the phenomena they attempted to account for could be better explained by appealing to a range of alternative hypotheses (see e.g. Gould 1978; Kitcher 1985; R. C. Lewontin 1979). Other critics argued that human sociobiology was sexist, genetically determinist, and ignored human diversity. Human sociobiologists were also accused of inadequately characterizing culture and underestimating cultural influences on our diverse behavior (cf. Fehr 2011; Segerstråle 2000). All these criticisms, in slightly varied form, have been carried over to evolutionary psychology and make up the "barrage of criticism" that Barrett refers to.

Barrett (cf. Confer et al. 2010) attempts to deflect some of the barrage of criticism by pointing out that "the rise of evolutionary psychology has led to rampant generation of evolution-flavored hypotheses throughout the social sciences, not all of which would pass basic tests of evolutionary plausibility" (Barrett 2015, 12). Barrett implies that if critics are

focused on this kind of work, then he is their ally. He also rejects evolutionary psychology hypotheses that are not framed as they would be by animal biologists and other evolutionary theorists. However, this move of Barrett's only accounts for a portion of the barrage of criticism. The focus of many critics of evolutionary psychology is popular works (see e.g. Pinker 2002; Wright 1994) rather than "evolution-flavored hypotheses" found in the pages of social science journals. Sociologists worry that popular books championing evolutionary psychology leave the impression that the science about the evolutionary origins of our behavior and culture is settled. They go on to argue that this situation is further compounded by media presentations of such popular works as works of science (see e.g. Fuller 2006; Jackson and Rees 2007). Further, critics have sometimes assumed that their critical attacks on popular works championing evolutionary psychology are sufficient to undermine the evolutionary psychology research program. This situation is a bit of a mess and confusing for students of philosophy of social science. My recommendation is that we focus our attention on critical discussion of the work of practicing evolutionary psychology researchers. Discussion of the popularization of scientific practice and presentation of popularizations as if they were cutting-edge science by the media is important but will not be our focus here (Barker 2015 confronts some of these important issues). We first turn to the debate over evolutionary psychologists' notion of human nature.

### Evolutionary Psychology and Human Nature

Evolutionary psychologists propose that human nature is biologically based. Many critics challenge this view. Some reject the view on the grounds that our nature is culturally specified rather than biologically based (see e.g. Prinz 2012). This type of criticism is undermined by the unfounded presupposition that culture and biology can be clearly distinguished (cf. Buller 2005). Work on cultural evolution and on the complex co-evolutionary processes underlying many human traits reveals that to the extent that cultural factors and biological factors can be distinguished, they both play important roles in the evolution of human behavior, social organization, and artifact production (see e.g. Lewens 2015; Richerson and Boyd 2005; Sterelny 2012). Criticisms of evolutionary psychologists' concept of human nature with more bite invoke evolution. The charge is that evolutionary psychologists' concept of human nature is not consistent with evolutionary thought (cf. Buller 2005; Lewens 2015).

Evolutionary psychologists propose that human nature is expressed in cultural universals and its biological basis is the collection of evolved psychological mechanisms we share (Tooby and Cosmides 1990). Buller (2005, especially ch. 8) draws on Hull (1986) and Sober (1980) to argue that this notion of human nature presupposes a species concept that is not accepted by evolutionary biologists and fails to acknowledge or account for human variation. The first charge is that evolutionary psychologists take the species *homo sapiens* to be characterized by a collection of shared traits. This is not how biologists characterize species. Rather, species are lineages, historical entities with beginnings and ends, in the case of extinction. The view that species are identified by a cluster of traits that their members share has the following consequence: we could go extinct and at another time a population could arise with the same defining cluster of traits in common. On the view of species presupposed by evolutionary psychologists, the new population would be the same species as us. This conclusion is not supported by the evolutionary view of species. On this view the only way to be part of the same species is to be part of the same lineage.

So the account of species presupposed in evolutionary psychologists' account of human nature is not an evolutionary one.

Buller's second charge is that evolutionary psychologists' account of human nature ignores or cannot account for human variation (cf. Lewens 2015; Ramsey 2013). Humans exhibit a huge amount of morphological, physiological, behavioral, and cultural variation; like all other organisms we exhibit within-species variation. To propose that our nature consists in universal traits, or the mechanisms underlying those universal traits, ignores all this variation. If evolutionary psychologists counter that their view accounts for variation in terms of what we have in common, they still face problems. Evolutionary biologists, such as population geneticists, are in the business of confronting and explaining variation. For them, variation is a property of populations and they strive to account for the distribution of variation in a given population in terms of the distribution of variation in earlier populations that gave rise to the one under study. Variation in the population can also be due to the range of responses organisms have to the different environments they confront (cf. Buller 2005; Hull 1986; Sober 1980). Evolutionary biologists do not propose an underlying set of mechanisms that organisms share whose expression is disrupted in different environments. This is how evolutionary psychologists appear to use their account of human nature to explain variation. If so, their account of human nature is not an evolutionary one.

Barrett responds to both of Buller's charges but first combines them as follows: "Some philosophers and biologists argue that the fuzzy and variable nature of species and populations means that treating any species as having a nature is a kind of category error—species just aren't that kind of thing" (2015, 320). Barrett agrees that other evolutionary psychologists have ignored or failed to account for human variation; further, he agrees that it is the job of any evolutionary approach to confront and account for variation. However, he objects to critics who suggest that we cannot present an evolutionarily sound notion of human nature. He says, "Whatever human nature is, it's a biological phenomenon, with all that implies" (321). What Barrett takes this to imply is that human nature is a thing that is "a big wobbly cloud that is different from the population clouds of squirrels and palm trees. To understand human minds and behaviors, we need to understand the properties of our own cloud, as messy as it might be" (332). So human nature is not a collection of traits we share but the collection of all of the traits expressed in our lineage.

Buller anticipates Barrett's alternate view and responds as follows: "one possibility is that the concept of human nature could refer to the totality of human behavior and psychology." He goes on to say that this version of human nature "has no particular theoretical meaning; it is merely an abbreviation for talking about the rich tapestry of human existence" (Buller 2005, 420). Tim Lewens characterizes a similar account of human nature to Barrett's as "simply a collection of informative truths about humans" (2015, 77). He goes on to say "Once an account of human nature is loosened up so as to make room for variation ... there is no way to gain control of it" (79). According to Buller and Lewens, then, Barrett's attempt to salvage an evolutionarily viable account of human nature results in no account of human nature at all or, at best, results in what Lewens calls a "libertine" account of human nature, which is innocuous but does no explanatory work. There are several people currently attempting to defend accounts of human nature that both serve evolutionary psychology and are consistent with evolutionary thought in general (see e.g. Machery 2008). As a result, this debate about evolutionary psychology is ongoing. We now turn to issues surrounding evolutionary psychologists' adaptationist approach.



## Evolutionary Psychology and Adaptationism

Buller's (2005) critical work on evolutionary psychology is structurally similar to Philip Kitcher's (1985) critical work on human sociobiology. Buller argues that evolutionary psychologists' work can be challenged on evolutionary grounds and he also proposes alternate explanatory hypotheses for various phenomena that evolutionary psychologists take themselves to have accounted for. Buller's support for some of his alternate hypotheses has been questioned (see e.g. Machery and Barrett 2007) but his criticisms of evolutionary psychology on evolutionary grounds are supported and shared by many evolutionary biologists and philosophers of biology (see e.g. Coyne 2009; Downes 2015; Lewens 2015; R. Lewontin 1998; E. A. Lloyd 1999; E. A. Lloyd and Feldman 2002; Richardson 2007; Woodward and Cowie 2004). Here we focus on just one strand of Buller's evolutionary criticism, his attack on the type of adaptationism evolutionary psychologists adopt.

There are numerous versions of adaptationism (cf. Godfrey-Smith 2001; Lewens 2009) and here we focus just on the adaptationism defended by evolutionary psychologists. The term adaptationism was used as a pejorative by some biologists (see e.g. Gould and Lewontin 1979; R. C. Lewontin 1979), but subsequent work reveals that this charge does not discriminate well between distinct kinds of evolutionary hypotheses (cf. Downes 2015; R. C. Lewontin 1978; Seger and Stubblefield 1996). Evolutionary psychologists hold that psychological mechanisms of interest, such as our mechanism supporting snake avoidance, are adaptations. These mechanisms are products of natural selection as opposed to other evolutionary processes such as drift or meiotic drive (see Sober 2000 for a nice introduction to various alternate evolutionary processes to selection). An adaptation, in this sense, is a specialized mechanism that solves a specific problem that the organism faced in its environment. These adaptations are also universal in the population. Evolutionary biologists refer to such traits as "fixed" or "at fixation." Evolutionary psychologists take psychological adaptations to be most closely analogous to organs such as kidneys. On this account, the snake fear mechanism evolved to solve the problem of dangerous snakes in the environment just as the kidney evolved to solve the problem of balancing bodily fluids. Buller argues that this account of adaptation is incomplete or too narrow.

Lewens nicely summarizes one main thrust of Buller's criticism as follows: "there is no special significance attached to traits that are at, or near to, fixation, and the explanatory processes that evolutionists deal in are just as suited to accounting for traits that are present in different proportions" (2015, 66). Buller points out that phenotypic plasticity—the ability of an organism to change phenotype in response to its environment—is just as likely to be the result of natural selection as a fixed phenotype. Some features of environments are very stable and predictable and selection may favor one sure-fire mechanism that helps the organism deal with these features, but lots of environments are highly dynamic and unpredictable and produce more selection pressure for flexible response. Many biologists, philosophers, and social scientists emphasize that humans are highly flexible and all claim that it is this flexibility that is the product of natural selection in our case (see e.g. Buller 2005; Cashdan 2013; Godfrey-Smith 1996; Griffiths 2011; Ramsey 2013; Sterelny 2003). On this view, not only is flexibility of phenotypic response to our dynamic environments a product of natural selection, but variation at both the genetic and the phenotypic level is sustained by natural selection. For example, a lot of genetic diversity is maintained in the genes underlying our immune systems. What Buller and others point out here is that natural selection is not just a process that fixes traits in a population or fixes genes in a population.

Barrett responds to this line of criticism by saying that evolutionary psychologists acknowledge phenotypic plasticity and humans' flexible responses to changing environments. Critics still maintain that this acknowledgement is not enough. The idea here is that if evolutionary psychologists took on board a more encompassing notion of adaptationism, they would avail themselves of a wider range of evolutionary hypotheses about how humans deal with their dynamic environments. Instead, the critics say, evolutionary psychologists always resort to accounting for our flexibility in the same way: we have a collection of specialized psychological mechanisms, shaped by selection, that allow for our flexible response. This debate about adaptationism is also ongoing. Critics have yet to engage Barrett's discussion of phenotypic plasticity and our flexible response to dynamic environments. What we turn to now is an alternative proposal about the evolution of mindreading, which gives a sense of the kind of alternative hypotheses evolutionary psychologists rule out by considering only hypotheses about selected psychological mechanisms.

### **Alternate Evolutionary Hypotheses about the Origin of Mindreading**

As we saw above, cognitive and evolutionary psychologists refer to our ability to attribute beliefs and desires to others and to explain behavior in terms of these postulates as mindreading. We saw that Barrett claims that our mechanism underlying our mindreading ability is a classic adaptation in his sense of the term. Kim Sterelny (Sterelny 2003) argues that this is not the right approach to explaining mindreading at all. Sterelny says that the way evolutionary psychologists approach mindreading is modeled on the way psycholinguists account for language. On this account, our linguistic ability is explained in terms of an innate mechanism, or set of mechanisms, that we all have, which enables us to communicate in a language. Other language speakers provide the environmental triggers that bring the language mechanism on line. Sterelny argues that this line of reasoning, one that is widespread in developmental cognitive psychology, is perhaps only well suited to the case of language. Sterelny thinks that the extension of this explanatory approach to mindreading, moral judgment, and all manner of human capacities is misguided. The key to Sterelny's criticism of evolutionary psychology is his presentation of alternate evolutionary hypotheses.

Nativists like Noam Chomsky originally responded to behaviorists. Nativists argued that behaviorism did not have the resources to explain complex capacities such as our linguistic ability. Peter Godfrey-Smith (1996) characterizes this debate as one between proponents of internalist as opposed to externalist forms of explanation. Internalists' explanations invoke mechanisms inside us in explanations of behavior. Psycholinguists' innate grammar, invoked to account for our ability to learn and speak languages, is such a mechanism. Externalists' explanations rely on features of our environment. For example, behaviorist psychologists account for our behavior, even complex behavior such as learning and speaking a language, in terms of stimuli and responses to those stimuli. Sterelny is an externalist in this sense but his externalism gives him many more explanatory resources than behaviorists have. Sterelny's (2003) externalist approach to mindreading is evolutionary and emphasizes niche construction (see Laland, Odling-Smee, and Feldman 2000 for an introduction to niche construction). Behaviorists construe our environment as a collection of stimuli. Sterelny invokes a highly structured environment that has a great deal of potential for shaping development. The basic

idea of niche construction is that organisms create aspects of their own environment—rabbit burrows, termite mounds, human tools, and other artifacts—and these structured environments constrain development but also, crucially, produce different selection pressures. Applying all this to mindreading, we get the proposal that humans have various basic perceptual capacities, doubtless shared with our primate ancestors, which, in the relevantly structured environment, can support our interpretation of others. On this approach, there is no need to seek the selective regimen that produced one specialized mechanism for mindreading. Rather we specify the structured environment that would support the re-tuning of basic perceptual capacities for the task of interpreting others.

Sterelny's is not the only alternative hypotheses about the evolution of mindreading. Sarah Hrdy (S. B. Hrdy 2009) defends an interesting evolutionary approach that places the selectively relevant environment for our mindreading capacity in our infant life stage. The idea here is that mindreading is a product of several factors. First, we spend a long time completely dependent on the care of others relative to other animals, including our closest primate relatives. Second, one of the keys to surviving this life stage is to have a grasp on who is a caretaker and who is not and to make sure that we are in good hands. Third, Hrdy relies on life history theory, whose proponents differentiate between selection pressures at different life stages of organisms (see Roff 2002 for a comprehensive introduction to life history theory). For example, there are quite different selection pressures on adult frogs and tadpoles. According to Hrdy, our adult mindreading capacity is built upon this infant survival strategy. Neither Sterelny nor Hrdy proposes and defends specialized psychological mechanisms that evolved for mindreading, but both propose evolutionary hypotheses intended to account for our capacity of mindreading.

To date evolutionary psychologists have not responded directly to the challenges posed by alternative evolutionary hypotheses about mindreading such as Sterelny's and Hrdy's. Barrett discusses neither of these hypotheses and does not respond to the line of criticism of evolutionary psychology that accompanies them. Further productive debates about evolutionary psychology could begin here. The general issue at stake would be where the evolutionary psychologists favored approach is best used and where other evolutionary approaches do better (see Laland and Brown 2002 for a presentation of many of the alternate evolutionary approaches to explaining human behavior). If future debates headed in this direction, participants would have to be well versed in evolutionary theory, in all its guises, and prepared to have some of their cherished hypotheses subjected to careful scrutiny.

## Conclusion

These three debates (or potential debate in one case) are highlighted here because they exemplify the kind of productive philosophy of science discussions we can have about evolutionary psychology. As noted above, much of the controversy about evolutionary psychology is focused on popular presentations of work in the field. There is much work for socially engaged philosophers of science to do in assessing the impact of popular evolutionary psychology on policy and society in general and Gillian Barker (2015) has begun to make useful inroads here. One recommendation is that philosophers critically assess evolutionary psychology by focusing on research in the field rather than by focusing on popularizations of that work. The critical work of assessing the influence of popularizations of evolutionary psychology is properly focused on popular works.



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