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Understanding Evolutionary Approaches to Human Behavior

Essay Review of *The Evolution of Mind: Fundamental Questions and Controversies* by Steven W. Gangestad and Jeffrey A. Simpson¹

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Theories are like illuminating lenses. They can enable people to see things they could not see before, and they can cast things previously understood in a different light. However, theoretical perspectives must be constructed or reconstructed by those who use them. Scholars who take the time to do it right are rewarded with fresh views of old worlds; those who do it wrong end up with distorted figments of their own imaginations.

When scholars view phenomena through different theoretical lenses, they inevitably end up seeing different things. As exemplified in the excellent book, *The Evolution of Mind: Fundamental Questions and Controversies*, edited by Steven W. Gangestad and Jeffrey A. Simpson, our understanding of human behavior can profit from debates among theorists who take the time to understand each other's points of view, and seek to resolve their differences. In contrast, knowledge is poorly served when psychologists with one theoretical bias misrepresent competing approaches, attribute ideas to them that they do not advance, criticize these misattributions, and conclude that they have disconfirmed the approaches they oppose. This practice is akin to an optometrist reconstructing a competitor's glasses using the wrong pieces, then loudly proclaiming that they produce a cockeyed vision of the world.

To produce *The Evolution of Mind*, Gangestad and Simpson identified 12 important theoretical questions and invited eminent evolutionary theorists and some of their critics² to respond to one or more of them in 2,000 words or less. In all but

¹ New York: The Guilford Press, 2007, 448 pp. ISBN 10: 1-59385-408-0.

² The cast of contributors included C. Aktipis, R. Alexander, P. Andrews, H.C. Barrett, M. Mulder, R. Boyd, D. Buss, K. Coe, L. Cosmides, C. Crawford, P. DeScioli, R. Dunbar, A. Eagly, E. Ermer, B. Finlay, M. Flinn, S. Gangestad, D. Geary, M. Gurven, E. Hagen, K. Hill, H. Honeycutt, S. Kanazawa, H. Kaplan, D. Kenrick, J. Lancaster, R. Lickliter, D. Lieberman, G. Miller, S. Mithen, H.K. Reeve, P. Richerson, M. Schaller, P. Sherman, J. Silk, J. Simpson, E. Smith, C. Stanford, K. Sterelny, J. Sundie, D. Symons, R. Thornhill, J. Tooby, D.S. Wilson, and W. Wood.

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one case, the editors received constructive responses to their questions. The contributors understood the ways in which their perspectives differed, and searched for common ground. I will first consider the anomalous unconstructive critique, then review briefly the main controversies in the area, explaining how they pertain to an issue I have sought to understand – the evolution of morality.³

Unconstructive Critiques of Evolutionary Approaches

In response to the question, ‘How useful is evolutionary theory in accounting for systems of ontogenetic development?’, some contributors explicated the view of ontogeny espoused by developmental systems theorists. However, after advancing their own view, Honeycutt and Lickliter contrasted it with an invalid, straw man caricature of evolutionary psychology that no one has ever advanced. According to these theorists, ‘proponents of the neo-Darwinian synthesis of the last century effectively sidestepped the issue of development by treating it as a predominantly predetermined affair. Genetic factors were thought to determine both the physical and behavioral characteristics of an organism (the phenotype), and these internal factors were believed to be buffered from any experiential effects occurring during individual ontogeny’ (p. 171). It is astounding that these theorists would promulgate this and other myths in view of the fact that several evolutionary theorists explicitly corrected them in commentaries following one of their earlier articles [see the commentaries following Lickliter & Honeycutt, 2003].

Debra Lieberman (chapter 20) and other contributors correct them yet again. Lieberman explains that Honeycutt and Lickliter confuse the goals pursued by evolutionary psychologists with the goals pursued by behavioral geneticists: ‘Partitioning the phenotypic effects due to one’s genes and those due to the environment is not a goal of evolutionary psychology; behavioral genetics is a field that tries to identify the heritability of particular traits, that is the proportion of variance *between individuals* that can be attributed to genetic differences’ (pp. 192–193). In addition, Honeycutt and Lickliter fail to understand that evolutionary psychologists focus on the ultimate causes of developmental phenomena, whereas developmental systems theorists focus on the proximate causes: ‘The failure to distinguish between ultimate and proximate research in biology is at the heart of the unfair charge that sociobiologists are trying to establish Genes-R-Us’ [Alcock, 2001, pp. 42–43].

Lieberman goes on to explain that evolutionary psychologists (a) agree with developmental systems theorists that development occurs through complex interactions among many causal factors, (b) do not, therefore, believe that traits are ‘pre-formed’ in genes, and (c) attribute multiple, essential roles to the environment. Indeed, the eminent evolutionary psychologist, Charles Crawford (chapter 6), has characterized evolutionary psychology as an ‘environmentalist disciple’ [Crawford and Anderson, 1989]. As explained by Pascal Boyer (chapter 36), there is ‘a persistent misunderstanding in the social sciences in the notion that evolutionary models are only about “closed” programs, inflexibly developed regardless of the external cir-

³ See Krebs [in press a, b, 2005a, b] for additional references pertaining to the evolution of morality.

cumstances' (p. 334). Boyer adds, 'evolution results in not only a specific set of adult capacities but also a specific set of developmental pathways that lead to such capacities' (p. 335).

As revealed in *The Evolution of Mind*, there is plenty to question in evolutionary approaches to human behavior. However, as asserted by the editors, 'the field's long-term interests are served if we move beyond debates between straw men and center on issues of real, substantive disagreement' (p. 399).

Controversies in the Field, with Applications to Morality

The 11 remaining questions and the main positions advanced by contributors supply a good sense of the controversies in the area and the kinds of issues that evolutionary approaches are equipped to illuminate. The questions are:

(1) Is it possible to infer which events in the distant past shaped the minds of modern humans? After all, we cannot observe events that occurred hundreds of thousands of years ago directly.

(2) What use, if any, is there in assessing fitness, or reproductive success, in current environments?

(3) Is the human mind divided into domain-specific mental modules akin to the heart, kidneys, and lungs; or is the mind organized in terms of general purpose procedures?

(4) How useful is it to model the costs and benefits of social strategies quantitatively, for example in the way game theorists do?

(5) Did selection at the level of groups, as opposed to the level of genes or individuals, affect the design of evolved mental mechanisms in humans?

(6) Can we draw inferences about the evolution of human characteristics from the behaviors of our closest phylogenetic ancestors (apes)?

(7) What caused humans to diverge millions of years ago from an ancestor shared with other primates? What were the most important selection pressures responsible for creating uniquely human characteristics?

(8) What processes mediated the evolution of the human brain? In view of the significant costs of creating and maintaining a large brain, what were the key compensatory benefits it proffered?

(9) What were the main adaptive benefits of abstract intellectual abilities and the capacity for symbolic language? Did they pertain primarily to the solution of problems in the physical world, or in the social world?

(10) How does culture evolve, and how does cultural evolution relate to biological evolution? Can biological and cultural evolution become uncoupled? Is it possible to understand one without understanding the other?

(11) How different are the mating strategies adopted by men and women, and what is the source of the difference? How do evolved dispositions interact with cultural norms to design the mating systems apparent in different societies?

All evolutionary theorists assume that the human mind evolved in response to adaptive pressures in ancestral environments. However, theorists differ about whether it is possible to reconstruct these environments, the value of reconstructing them, and the best methods of accomplishing this task. Evolutionary theorists have attempted to reconstruct the evolution of the human mind in five main ways: (a) by

deriving inferences from archaeological data (fossils); (b) by tracing the origin of mental mechanisms in ancestral species and tracking the ways in which the mechanisms have changed; (c) by examining similarities and differences between humans and other primates who share a common ancestor; (d) by 'reverse engineering' (examining the structure of evolved mechanisms and drawing inferences about the adaptive problems they were designed to solve, and therefore the kinds of environments in which they were selected), and (e) by examining the adaptiveness of traits in current environments.

A long-running debate pertains to the value of assessing the fitness effects of traits in contemporary environments. Critics have asserted that there is little reason to expect traits that were adaptive in the environments in which they originated to be adaptive in modern environments, and have suggested that we should view humans as 'adaptation executors,' not 'fitness-maximizers.' There is value in both perspectives. Many aspects of contemporary environments are similar to those in which traits evolved. With respect to morality, for example, most moral conflicts experienced by modern humans occur within the circle of relatively small groups of friends and relatives, and evolved dispositions to resolve such conflicts in cooperative and altruistic ways continue to be adaptive in these contexts. However, modern environments also differ significantly from those of our hominid ancestors, and give rise to thoroughly modern moral issues, such as those that relate to international relations and stem cell research. Some mental mechanisms acquired by humans are specialized for solving particular recurring adaptive problems; others are designed in flexible ways that enable people to create new mechanisms and adapt to novel environments.

Another issue that has evoked a great deal of debate pertains to the domain specificity of mental mechanisms. In the study of morality, some theorists have argued that moral reasoning is organized in structures of the whole, whereas others have argued that children develop different structures specialized for processing information in different domains. Two founders of evolutionary psychology, John Tooby and Leda Cosmides (chapter 15, with Elsa Ermer), have argued that because ancestors to humans did not experience general adaptive problems, it is misguided to expect 'general purpose' mechanisms to have been selected. Instead, they have argued, we should expect evolved mechanisms to be functionally specialized to solve particular, recurring adaptive problems. Other theorists have pointed out that mechanisms that evolved for one adaptive purpose (e.g., feathers for thermoregulation, reason for solving problems in the physical world) may be 'exapted' for other adaptive purposes (e.g., flight, solving moral problems), and that flexible mechanisms that enable animals to adjust to novel environments have considerable adaptive value. As indicated in this volume, the truth lies somewhere between the extreme positions.

Our understanding of human morality has been advanced significantly by game theory models of the evolution of cooperation and altruism [for reviews, see Gintis, 2007, and Ridley, 1996]. As pointed out by Kenrick and Sundie (chapter 14), quantitative models of behavior have both strengths and limitations. They can quantify complex relationships among many more variables than anyone could ever examine empirically. However, they have limited ecological validity and they do not 'reflect complex processes in the real world' (p. 142).

Darwin believed that selection at the level of the individual would favor selfishness, but that altruistic dispositions could evolve if groups of altruists produced more offspring than groups with selfish members did. The idea that altruistic dispositions could evolve through group selection fell into disfavor in the 1960s, but was resurrected by D.S. Wilson (chapter 22) a decade or so ago. Although most evolutionary theorists now accept multilevel selection theory – which postulates that selection can operate at the levels of the gene, individual, and group – theorists disagree about how important group level selection was in the evolution of altruistic dispositions in humans. Kurzban and Aktipis (chapter 24) propose looking for the footprint of group level selection in the adaptations that we would expect it to have designed, such as those that dispose individuals to uphold their groups. Boyd and Richerson (chapter 23) emphasize the role shared cultural norms play in reducing variance within groups and increasing variance between groups.

It is widely assumed that evolutionary psychologists are attentive only to the primitive mental mechanisms shared by humans and other primates. However, this assumption is false. For example, Darwin [1874] argued that although a primitive moral sense is rooted in social instincts, the unique moral sense possessed by humans is mainly a product of language and reasoning. I have argued that the structures of moral reasoning identified by Kohlberg and other cognitive-developmental theorists can be fruitfully reconceptualized as evolved structures [Krebs, 2005a].

To understand humans' unique capacity for symbolic language and thought, we must figure out what adaptive problems these abilities originally had to solve. Particularly intriguing are theories that attribute the 'runaway' evolution of the human brain to 'Red Queen' arms race processes such as those that characterize the give and take of social competition (Flinn and Alexander, chapter 26).

Contemporary evolutionary theorists have made major contributions to our understanding of how culture (including moral norms) evolves. Culture is both a product and a source of evolved mental mechanisms. Coevolutionary theorists such as Boyd and Richerson (chapter 35) emphasize the tremendous adaptive benefits of social learning. Individuals can acquire knowledge from others at very little cost, build on it, and pass it on to future generations. However, while evolved social learning mechanisms enable people to acquire fitness-enhancing information cheaply, they also render them susceptible to manipulation.

In closing, let me say that the exchanges in *The Evolution of Mind* contributed significantly to my academic goal: understanding human morality. I believe that the book is equipped to contribute to other readers' understanding of the issues of interest to them. The editors did a marvelous job of asking important questions, integrating contributions, finding common ground, and identifying unresolved issues. Evolutionary psychology is a young and rapidly growing theoretical approach that contains the potential to illuminate more proximately oriented accounts customarily advanced by psychologists. To benefit from the view evolutionary approaches provide, however, one must put in the effort necessary to understand their frames of reference.

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