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A different approach to human evolution—A review of “Baboon metaphysics: the evolution of a social mind”

Cheney D.L., Seyfarth R.M. (Eds.), *Baboon metaphysics: The evolution of a social mind*. Chicago: The University of Chicago Press; 2007. 358 pages, \$27.50

There are myriad approaches to studying the evolution of human behavior. Researchers may compare individuals from different societies or groups, squint over brain scans, or examine archeological sites for evidence of past behavior, to name just a few. Another approach is to step outside our own species and study our close relatives, the rest of the primates, looking for shared behavioral traits that may tell us something about the evolutionary trajectory of our own behaviors. This approach is somewhat underrepresented in the study of human evolution, which is curious given the overlap of interests between those studying human and nonhuman primate behavior.

Cheney and Seyfarth’s book *Baboon Metaphysics: The Evolution of a Social Mind* investigates how the physical and social environments of baboons interact to shape the behaviors we see today. They first provide an understanding of the ecological and social environments that these Old World primates face, then describe a series of ingenious field experiments that measure the baboon’s responses to a variety of social situations. Finally, they use this information to attempt to discern what these monkeys do understand about their social environment and how this information helps with their survival. Of particular interest to those studying humans, they explicitly discuss the evolution of social cognition in all primates, including humans. Their final chapter discusses the evolution of language, a trait not seen in its fullest form in any species but humans.

One of the highlights of this book, particularly for nonspecialists, is that, in addition to an excellent overview of the authors’ own research on this topic, it includes discussion of research in the relevant topics in other nonhuman primate species and other nonprimate species. Thus, in cases in which Cheney and Seyfarth and their team have not yet investigated a phenomenon themselves, they still provide discussion based on other’s work. Moreover, this broader perspective is essential for placing the baboon data in perspective with other species, primate and nonprimate. While primates are most commonly invoked to understand human behavior due to their phylogenetic proximity to humans, other species, too, may provide interesting insights.

Moreover, the various research methodologies are fully described in *Baboon Metaphysics*. This allows readers unfamiliar with primatology or with field work methods to understand how these studies can be done and draw their own conclusions about the interpretation of the data. Primatology is practiced both in the field and in captive settings, with the former typically involving primarily observational work and the latter primarily experiments. While Cheney and Seyfarth do field work, their work has a strong experimental component in the form of field experiments. Also, when discussing others’ work, time is given to both field and laboratory studies. Thus, there is a well-rounded view of primate social cognition.

Baboon Metaphysics begins with an interesting history of human interactions with primates, specifically baboons. Cheney and Seyfarth provide several well-documented anecdotal examples of baboon intelligence. For instance, there is “Jack the Signalman,” a baboon who threw the rail signals at the train station in Uitenhage, South Africa, for his disabled owner and Ahla, a goat-herding baboon, who knew the relationships between each individual in her herd of goats. We are also introduced to Eugene Marais, a South African man who lived among baboons for several years and was the first to realize the centrality of the social group in baboon life.

This is followed by several chapters that explain the background required to understand the baboon’s social behavior at Okavango, an environment that is dramatically shaped by the annual floods that inundate the region. These floods lead to incredible richness in food resources, but crossing the flood waters is a dangerous occupation for baboons, a popular prey item for a number of predators. Moreover, infants are under the constant threat of infanticide. Between the lions and the adult male baboons, one ends up wondering how any of the monkeys manage to survive in to their 20s!

The factors shaping social behavior are somewhat different for males and females. Although they live in groups, males rely primarily on themselves in social interactions. They must earn their rank through fighting and are constantly in competition with each other to secure mating opportunities and protect their place in the hierarchy. Females, on the other hand, inherit their rank from their mothers and rely on networks of female kin and social partners to help them navigate their social milieu.

Against this background are the field experiments, primarily playback studies, in which vocalizations are played by experimenters in controlled circumstances to test hypotheses about the function of those calls. This allows investigation of the baboons’ understanding of their social environment. For instance, Cheney and Seyfarth discuss baboons’ perception of other individuals’ relationships to their matriline (the major unit of social organization, which includes an older adult female and all of her female descendents) as well as their place in the dominance hierarchy. In fact, the baboons can apparently hold both of these pieces of information separately for each individual in

the group, implying a nested hierarchy in which others can occupy more than one place at a time. Baboons can also discriminate more transient relationship information, such as the short-term consortships that form between males and females at the time of female estrous. They also respond differentially to their social partners, based on recent interactions with the other monkey, or even the other baboon's kin.

This information is then used for an extensive discussion of very complex social cognition, such as theory of mind and self-awareness. Cheney and Seyfarth spend a great deal of time carefully documenting the behavior of baboons, which informs these topics through both their experiments and anecdotal observations. They then carefully analyze their findings in light of whether the baboons' behavior can be best explained by an understanding that others are autonomous beings with separate thoughts and motivations from one's own (full theory of mind), or basic behavioral contingencies. In this discussion, they include relevant experimental and observational work on other species, again placing the baboons in perspective.

Baboons, they conclude, behave as if they are aware that others have intentions, although there is no evidence that they understand what other baboons do and do not know. (In fact, there is evidence that they do not understand these mental states in others.) They further conclude that baboons are aware of themselves as a player on the stage of baboon social life, although they are not in danger of having "a full-blown identity crisis" any time soon (p. 216). As for the explanation for these behaviors, in the end, they come to the conclusion that while it is possible that baboon's behavior is guided by more than learned contingencies, it is not possible with current data to say whether this is true theory of mind. However, this section includes anecdotes that tantalizingly imply the possibility of greater understanding. This was one place that begged for a bit more discussion of their predictions for what future research may uncover.

The final set of chapters focuses on communication and language. Although baboons have quite a limited repertoire of verbalizations—far too few to consider a language—

Cheney and Seyfarth argue that the precursors of language are nonetheless present in baboons not found in their production of vocalizations, but rather in their comprehension of social information and thought processes. Thus, they are interested in the thought processes that must exist in order for language as we know it to be produced.

While baboon vocal production is quite limited, Cheney and Seyfarth emphasize the large amount of social information that is gained from the vocalizations the baboons hear. They posit that certain kinds of cognition are likely to precede language in evolutionary time. This cognition, they argue, is already present in baboons, who exhibit a "language of thought," which can be assessed from the syntactical nature of their social knowledge. Studying this cognition is a mechanism for studying the origins of language itself, even though baboons lack language. This approach, although likely to be controversial, opens new avenues for the study of humans' linguistic capacity.

In *Baboon Metaphysics*, there is a charming tendency to cite relevant bits of 19th century novelists, such as Austin, Thackeray, and Wharton, on their observations of social life and social relationships in the highly structured societies that they observed and put to paper. One wonders how these authors would have reacted to the comparison of their characters to monkeys. (Most likely they would have approved.) Although lighthearted, the fact that these comparisons resonate so strongly with us emphasizes the inescapable similarity between human and nonhuman social structure and relationships. Ignoring the rich source of information available from studying nonhuman primates unnecessarily limits our understanding of ourselves. Books such as this one, which bring together information on multiple species, will continue to be a valuable means for exploring the evolution of behavior in all species, including humans.

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