

## Evolutionary Psychology

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### Book Review

#### Asking Baboons What They Think

A review of Dorothy L. Cheney and Robert M. Seyfarth, *Baboon Metaphysics: The Evolution of a Social Mind*. University of Chicago Press: Chicago, 2007, \$27.50, 358 pp. ISBN 978-0-226-10243-6

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Most people who have read Cheney and Seyfarth's previous book, *How Monkeys See the World* (1990), would probably agree that it is a hard act to follow. That work was a milestone in the study of primate communication and cognition. Theory and experimentation have moved on since then (in no small measure due to the influence of that book), and one could be forgiven for expecting that a subsequent volume by the same authors might struggle to reach the same heights. So let me reassure the reader right away: *Baboon Metaphysics* is a worthy successor indeed, quite different in style and approach, but again brimming with new findings, insightful questions, and intriguing interpretations. With the focus switched from eastern African vervet monkeys to southern African chacma baboons, the authors describe a series of studies, largely but not exclusively based on vocalization playback experiments, and show how we can thus gain insights into baboons' minds, with particular emphasis on the importance of mental representations of social relationships and events.

The book opens with a highly readable overview of historically different perspectives on the problem of mind and mental states. Cheney and Seyfarth argue that the best way to understand the intelligence of baboons is to consider it from a social perspective, and that how baboons use and respond to vocalizations is a valuable tool in this respect. They then set the scene in which their studies were done. The Okavango Delta baboons' socioecology is striking for several reasons: compared to other baboons the population density is high, their seasonally inundated savannah-woodland home ranges are small, there is high turnover of dominant males, high rates of infanticide, and high rates of predation. One study shows that stress, measured by fecal glucocorticoid levels, remains high for weeks after a predation event, and this is especially so for adult females who lose a relative; thus, we can already start to see the importance of social relationships for these primates.

Chapters 4 through 6 present the bulk of the findings from the field. Within the baboon group, adult males and adult females have somewhat different preoccupations. For males, attaining high social rank appears crucially important, as this gives them priority access to females. Challenges to a male's dominance status may be through vocal and physical contests, and dominant males appear to be anxious much of the time, even when in consortship with adult females. Newly dominant males are typically infanticidal, leading to increased stress especially in lactating females. Interestingly, however, stress levels may be reduced if females can establish close friendships with other adult males, thereby obtaining some measure of protection. For females, family ties and social networking are central.

Several experiments are described in which playbacks of vocalizations are used to simulate the approach of specific individuals toward the subject, or normal versus anomalous interaction sequences in the group. These experiments require enormous patience and know-how if they are to yield valid data, and the dedication and inventiveness of the researchers deserve praise. Through these studies we learn about the importance of grunt vocalizations, for example in post-aggression reconciliation, and how hearing the grunt of a previously aggressive dominant female is more likely to lead to approach and tolerance by the subordinate victim than if no grunt occurred, or if the grunt of another dominant female was presented instead. Also, baboons look longer toward the sound source when they hear sequences that violate the established dominance hierarchy, such as grunting by a low-ranking individual followed by fear-barking by a dominant.

The importance of kin relationships emerges time and again. Thus, threat vocalizations by an aggressor's relative will elicit stronger reactions than those of a non-relative, but only if the subject was the target of the original aggression; if not previously threatened, the subject may well infer that the presented threat-grunt is not worth worrying about. As each new chapter unfolds, the complexity of the baboons' social world becomes increasingly clear (though not necessarily easier to understand!), with permanent kin ties, more transient cross-family ties, friendships, alliances and sexual relationships all influencing their behaviour and, of course, putting demands on their mental representations of the world.

Given the complexity of the mental operations involved in updating, organizing, manipulating and exploiting all of the events taking place in their social environment, Cheney and Seyfarth make a strong case that baboons surely do not simply rely on behavioristic rules of associative learning and conditioning. Instead, baboon socio-cognitive operations are likely to involve the equivalent of "chunking" to increase memory storage capacity, and the formation of higher-order rules or patterns, "theories" that give rise to implicit expectations about social events.

Chapters 7 and 8 cover the social intelligence hypothesis and Theory of Mind in some detail, with some recent studies on other species nicely brought in to widen the discussion; neurological and neurophysiological evidence is presented, along with work on primates' and nonprimates' abilities to respond to cues such as gaze, their abilities to recognize others' perspectives and motives, and to conceal information from others. Although birds and some nonprimate mammals may perform some impressive social-cognitive feats, according to Cheney and Seyfarth there are at least five "components" shown by baboons that remain to be convincingly shown by these other species; at this point I invite readers to obtain the book and discover what these are!

The perennial and thorny issue of self-awareness is addressed in Chapter 9, in which episodic memory, self-recognition, blindsight, and planning are all brought into the discussion. For the authors, baboons are certainly capable of distinguishing “me” and “not me” (the playback experiments show this clearly), but without the ability to actively reflect about their relationships with others, or even about themselves. Baboons are extremely self-centred; for example, they only show stress responses when some aspect of “self” is at risk, such as their own dominance position or their physical wellbeing. Their notion of self may expand to include kin, but this equating of self with family members is not done on a conscious level, or with human-like self-awareness.

Chapters 10 and 11 explore communication and precursors to language in more detail. Cheney and Seyfarth point out that there are subtle variations in baboon vocalizations so that two calls that sound similar to us may mean quite different things to a baboon. Using evidence from a variety of sources, they explore in some depth the degree of flexibility and voluntary control of vocalizations, and animals’ understanding of sound-meaning pairs, including cross-fostering work in macaques, alarm calling by other African and Asian monkeys, experiments on operant control of vocalizations, and reports of fast-mapping by dogs and sea-lions. Primates appear capable of controlling whether to vocalize or not, but the same does not hold for detailed acoustic features of their calls, which appear fixed. Furthermore, baboons do not utter anything like sentences, and they do not make inferences about others’ knowledge states; in other words, they do not have true linguistic communication, although they can be said to possess a “language of thought.”

The final chapter ties together all that has gone before, and re-emphasizes the central importance of social factors in the ecology of group-living species. The take-home message is quite clear: while baboons recognize other individuals’ basic intentions and motivations, they are oblivious to their knowledge states and beliefs about the world, and in fact they are oblivious to their own. Unlike humans, baboons are largely stuck in the here-and-now, unable to engage in mental time travel due to their lack of a reflective self. This is fairly strong stuff, inviting empirical challenges. In fact, recent studies could already require some modification to the authors’ view about knowledge of chimpanzees’ social cognition, but in general the discussion is impressively up to date, with the inclusion of many recent and diverse papers relevant to what could be called “comparative metaphysics.” This is not just a volume for primatologists!

There is a total absence of graphic representations of data in the book, which further distinguishes *Baboon Metaphysics* from *How Monkeys See the World*. This is not really a weakness, however, as the outcomes of the studies are described so well. Instead, a good number of photos illustrate life for the baboon subjects, and help us even more to achieve what the authors set out to do in the text, which is to improve our understanding of baboon’s life, both physical and mental. They have done a superb job.