

## **Evolutionary Theory and Primate Behavior**

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Evolutionary geneticist Theodosius Dobzhanski (1973) stated that “Nothing in biology makes sense except in the light of evolution.” Primate behavior is a biological phenomenon and as such it is likely to be the product of evolution. Primate behavior can be studied at different levels of analysis—ontogeny, causation, function, and phylogeny—and from the perspective of different disciplines such as biology, psychology, or anthropology. Regardless of the type of questions being addressed and the discipline being used as a theoretical and methodological framework, it is unlikely that a deep and comprehensive understanding of primate behavior will ever be achieved without a consideration of evolutionary issues. The main motivation for us to produce this special issue was to promote links between primatological research and important concepts and developments in behavioral ecology and evolutionary biology.

The importance of evolutionary theory to understand behavior was only fully appreciated almost 100 years after the publication of Darwin’s (1859) *The Origin of Species*, thanks to the seminal contributions of scholars such as William Hamilton, George Williams, Robert Trivers, and John Maynard Smith. They revolutionized the evolutionary study of behavior by providing a wealth of testable hypotheses about the adaptive value of many aspects of behavior, including predator avoidance, foraging, cooperation and competition, mating and parenting. Although studies on the adaptive function of behavior were undertaken with virtually every animal species, evolution-oriented research has progressed and expanded at a faster pace with some animal taxa than with others. A cursory analysis of the recent animal behavior

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literature suggests that the percentage of studies on the adaptive function of behavior is lower for primates than for insects, fish, birds, and nonprimate mammals. Accordingly, primate research is often ignored or mentioned only in passing in influential monographs, edited volumes, and textbooks in behavioral ecology (Alcock, 2001; Andersson, 1994; Krebs and Davies, 1997) so that most behavioral ecologists and evolutionary biologists are familiar with only a few, mostly outdated, primate studies.

Apart from the common mutual taxonomic ignorance of both primatologists and nonprimatologists (Harcourt, 1998) and the fact that researchers with other taxa, especially other mammals, have fewer taxonomically specialized journals at their disposal, there may be two main reasons for this isolation (Janson, 2000; Kappeler and van Schaik, 2002). First, the required experimental approach for conclusive studies of problems in evolutionary biology is rarely, if ever, possible with primates. Both ethical issues and practical problems related to slow reproductive rates or small sample sizes of primates explain this limitation. Second, the natural history of an organism typically guides the kinds of questions that can be meaningfully asked. Because of qualitative differences in key life history traits among taxa, e.g., internal vs. external fertilization, oviparity vs. viviparity, some research questions are more relevant to some organisms than to others. For example, questions dealing with paternal care and male quality are much more pertinent for female birds than for female mammals, and therefore also for the corresponding researchers. As a result, studies of relevant aspects of sexual selection in birds can keep pace with corresponding theoretical developments and currently occupy a disproportionate share of general evolutionary journals. Conservation biology and studies on the evolution of cooperation are the only examples of modern integrative disciplines, in which primates are not underrepresented. Thus, aspects of primate natural and life histories may underlie and explain part of their underrepresentation in behavioral ecology and evolutionary biology, but they should not serve as an excuse for primatologists' complacency.

The specific goal of this special issue of the *International Journal of Primatology on Evolutionary Theory and Primate Behavior* is to examine some of the best known evolutionary theories of behavior and to discuss critically whether the findings of primate behavioral research are consistent with them. It is clear that even though not all hypotheses derived from evolutionary theory have always been supported by primate data, the adaptationist program (Mayr, 1983) has been of enormous heuristic value for primate behavioral research. The contributions to this volume pay tribute to the fact that evolutionary hypotheses have stimulated a great deal of research and have produced a significant amount of new knowledge on the behavioral biology of nonhuman primates. Such research and knowledge

have often led to formulation of new and more sophisticated evolutionary hypotheses and a better appreciation of the degree to which the behavior of primates is adapted to their ecological and social environment. We hope that the articles in this special issue will encourage more primatologists to seriously consider tests of adaptive hypotheses as part of their research, so that the gap with mainstream evolutionary biology will eventually be closed.

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