American Journal of Primatology 69:353–357 (2007)

MEDIA REVIEW

A Family Reunion Among Estranged Cousins

Review of *Primate Psychology* edited by Dario Maestripieri. Cambridge, Massachusetts, Harvard University Press, 2003, ix+619 pp, 43 figures, 12 tables.

Primate Psychology aims to stimulate a rapprochement between the theories and methods used by contemporary psychologists and primatologists in their behavioral research. It is directed toward primatologists who study nonhuman primates (hereafter called primates), and psychologists who study humans. Each chapter provides sufficient background so that readers of either orientation will be able to appreciate the interdisciplinary connections presented. Given the scope and depth of its coverage, supported by 130 pages of references, it could well have been titled *The Handbook of Primate Psychology*. However, unlike a handbook, it is well worth reading from beginning to end.

Maestripieri states the case for interdisciplinary communication and importance of comparative studies in the first chapter. He begins by presenting Tinbergen's [1963] four questions about behavior that provide the conceptual framework used by virtually all of the contributors, viz., questions addressing the contribution made to an organism's survival and reproduction (function), the interaction between genetic and environmental influences on development, the causal mechanisms, and the evolutionary history (phylogeny). The early studies of behavior undertaken by psychologists and biologists did not differ greatly with respect to which questions they asked; however, by the end of the last century the two approaches had diverged. Most primatologists focused on functions, and most psychologists focused on the operation and development of causal mechanisms, thereby creating the gap that the book attempts to close. The remaining 15 chapters range broadly from brain physiology and hormones to theories about mind and personality, but all present comparisons between humans and primates.

The chapter by Higley discusses research on the mechanisms and development of aggression, and shows that low levels of serotonin in the central nervous system interfere with an animal's ability to inhibit aggression. Such research has also found that a combination of low serotonin and high testosterone increases the likelihood of impulsive aggression, and, as a result, interferes with an animal's success in forming positive relationships.

Judge's chapter on conflict resolution continues Higley's concern with aggression and examines the routes through which organisms repair relationships that have been disrupted by conflicts between individuals. It shows that a theoretical model of conflict-resolution strategies developed in studies of humans is also useful for describing nonhuman primates. The focus shifts from aggression to sexual behavior in the chapter by Wallen et al. about differences between males

DOI 10.1002/ajp.20371
Published online 16 January 2007 in Wiley InterScience (www.interscience.wiley.com).

© 2007 Wiley-Liss, Inc.

WILEY InterScience® DISCOVER SOMETHING GREAT

and females in the development of sexuality throughout their lifespans. Their discussion pays attention to the influences of individual experiences, hormones, and social context on male and female behaviors during childhood, adolescence, and adulthood. It ends by asking about the selective pressures that resulted in the flexibility that characterizes human sexuality, as exemplified by the continuation of sexual activity in postmenopausal women and castrated men.

Not surprisingly, Maestripieri's chapter on attachment epitomizes the integrative approach he advocates. He begins his history of attachment research with a close examination of Bowlby's theory, followed by a detailed account of research by both psychologists and primatologists on the impact of separation on primate mothers and infants. The question of whether the evident similarities between human and primate attachments are analogous or homologous (or both) is given a full airing. Maestripieri's discussion of attachment between mother and infants segues easily into Fairbanks' chapter on parenting. The latter contrasts the conventional psychological view of children's behavior as a consequence of parental influences with an evolutionarily informed view in which children also influence parental behavior, and in which the fitness interests of parents and offspring can collide.

The chapter by Roney and Maestripieri discusses the effects of parenting styles on the development of offspring; sex differences in the development of grooming, play, and altruism, as well as the impact of social systems on the selection of affiliative partners and altruism. Along the way, the authors discuss Hinde's view of the hierarchical relationship among interactions, relationships and social structure, kin selection, reciprocity, and several other concepts used in human and animal sociobiology.

The next two chapters focus more narrowly on the cognitive mechanisms that primates and humans use to understand their social and physical environments. The issue of whether similarities in the behaviors of humans and primates result from similar cognitive mechanisms is the main concern of the chapter by Bering and Povinelli. They examine research (much of it their own) into whether primates, especially chimpanzees, have a "theory of mind," that is, whether they understand that other creatures have minds that experience the world as they themselves do. According to Bering and Povinelli, both humans and chimpanzees can detect statistical regularities in the relation between the observed actions of an animal (e.g., looking in a particular direction) and the observable consequences of these actions. On the other hand, only humans develop the ability to detect the hidden, abstract causes of the actions of others (e.g., intentions or beliefs) or of physical events (e.g., gravity). They believe that the two cognitive abilities develop independently, and assert that the second does not grow out of the first.

In the next chapter, Call and Tomasello address more or less the same question as Bering and Povinelli, but present evidence from research that was not presented in the previous chapter. This evidence suggests that chimpanzees and very young children sometimes do understand that other individuals see (i.e., consciously experience) something that represents what is in the other animal's line of sight. The authors reject the dichotomous view of understanding advanced by Bering and Povinelli. In its place, they propose that chimpanzees have graded levels of knowledge about what others see, but may not be able to understand what other animals believe or desire. In their words, "The question is not whether chimpanzees have a theory of mind but rather which of the many psychological states of others that chimpanzees might possibly understand do they really understand."

The book moves from cognition to affect with Gosling and Lilienfeld's discussion about the extent to which methods used in the study of human personality can be applied to the study of the personalities of primates, and the criteria that should be used to evaluate the utility of this extension of personality research. They then present research about the extent to which "the big five" dimensions of personality that have been shown to describe personalities of humans in varying cultural contexts also apply to variation among the personalities found in different species of primates or among individual members of a single species. The authors conclude that the study of primate personality has not developed enough to do more than illustrate the feasibility and potential fruitfulness of comparative studies about what has typically been seen as exclusive to humans.

In contrast to personality, there has long been a comparative interest in the functions and mechanisms of emotions, the topic of the chapter by Aureli and Whiten. Their main concern is with the function of emotion. They describe a set of basic emotions, each of which enables animals to carry out fundamental life tasks (e.g., protection against injury, mating, etc.). The arousal of one of the basic emotions primes a specific set of psychological cognitive and response mechanisms that have evolved to deal with the problem. The differentiation of basic emotions allows animals to be flexible in varying their behavior as they encounter different situations. According to Aureli and Whiten, emotions can rapidly reorder the priorities among cognitive schemas and action patterns. (See Cosmides and Tooby [1995] for a fuller description of the "rearranging priorities" function of emotion.)

Paar and Maestripieri's chapter on nonvocal communication, the first of several on communication, begins with an examination of facial recognition. In humans and most anthropoid primates, the ability to recognize another's identity is a prerequisite for forming relationships, and relies primarily on the recognition of faces. The authors present research supporting the existence of this ability in a number of primate species and discuss the mechanisms involved in facial recognition. They also discuss whether recognition involves a specialized adaptation or stems from a general effect of expertise on the recognition of many categories of stimuli. Moving beyond recognition, the chapter considers the question of whether facial expressions convey information about an animal's internal state or function to elicit responses from the animal that observes the expression. The scope of the inquiry then broadens to include nonfacial gestures, especially pointing. It concludes that nonvocal communication can be intentional as well as unintentional, and can convey a large range of information that goes beyond "emotional states or impending behaviors."

The chapter by Owren et al. takes the next step in the communication section with an overview of research on nonlinguistic vocal communication. They challenge the traditional assumption that primate vocalizations are limited to signaling information about an animal's internally or environmentally caused motivational state. The authors argue that this view is invalidated by the absence of specificity in the relation between vocalizations and internal motivational states or external situations. In place of the traditional view, they propose that a listener can be affected directly by the acoustical properties of a vocalization, similarly to the way in which a human can be affected by the sound of a fingernail scratching a chalkboard. Information about the motivational state of the animal producing the vocalization plays no role in this kind of effect. A listener can also be affected indirectly by a learned association between the acoustic properties of the signal and events with which it has been paired. These associations may or may not convey information about the emotional state of the vocalizer.

Rumbaugh et al. continue the examination of communication by discussing research that has attempted to teach nonhumans to use language. They define language as ''… the construction and use of symbols through which a communicator intends to convey information to a recipient.'' In their view, language exists only when communicators have some level of ability to understand the mental states of the recipients. Without this ability, the communicator could not know whether it had actually conveyed information to another animal. While they are willing to consider language in many species, they limit their discussion mainly to apes. The remaining parts of the chapter involve a detailed examination of the various attempts to teach language to apes, and evaluate the extent to which the communication in these studies meets the criteria they set forth. They conclude that the criteria for the use of language are met by projects in which chimpanzees, gorillas, or orangutans learn to use American sign language, their own research using geometric symbols on keys linked to a computer, and the communication in a project involving an African gray parrot. At the close of the chapter, Rumbaugh et al. present a very useful table listing the many questions that have been raised about the communication systems they discuss, along with the answers suggested by the research they review.

The investigation of communication ends with a chapter by Hopkins et al. that examines the implications of similarities in brain asymmetries between humans and primates, especially the great apes. Hopkins et al. describe research indicating that in humans, the areas linked to the production and comprehension of language, and to right-handedness are usually larger in the left hemisphere than in the right. Homologous asymmetries have been found in the great apes and to a lesser extent in some monkey species. The central question raised about these similarities is whether they indicate the presence of an accompanying increased capacity for language. A positive answer to this question would support the view, expressed in the previous chapter, that apes who have learned to communicate using a variety of symbols are indeed using language. It would also argue against the idea that language in humans is the result of genetic change, due to chance, that created a sui generis human capacity for language. The last section of the chapter presents evidence for behavioral asymmetries in monkeys and apes, in terms of perception of species-specific vocalizations, laterality in the use of hands for object manipulation or gestures, and the production or perception of facial expressions. Hopkins et al. conclude by pointing out the need for evidence that the observed homologies in brain asymmetry are responsible for the observed asymmetry in behavior.

The final chapter by Troisi proposes that the comparative study of mental illness requires a redefinition of psychopathology that focuses on behaviors that compromise biological adaptation rather than on the ''subjective suffering'' of patients. Using this definition, Troisi discusses possible homologies in several pathological states found in primates and humans. Troisi proposes an alternative conception of psychopathology that is suggested by primatological research. While his initial definition emphasizes the maladaptiveness of pathological states, the alternative perspective holds that at least some states that are usually thought of as pathological may in fact be adaptive. They may provide a means of helping an individual escape from a damaging situation and move toward one in which its needs can satisfied. Troisi concludes that the disparity between psychology's traditional maladaptive emphasis and the adaptive view of psychopathology enhances the importance of understanding the functional consequences of atypical, distressing behavior. To the extent that the distress

has a functional outcome (i.e., it promotes the formation of social attachments and successful social behaviors), he suggests that it should not be considered pathological.

Primate Psychology definitely reaches its goal of bringing psychology and primatology back together within an evolutionary approach that addresses all of Tinbergen's [1963] four questions about behavior. While there was not much explicit integration among the chapters, other than some parenthetical references, their sequence generally provides support for readers looking for connections. Two small steps that might make the integration of the collection more salient would be to use the section headings within the chapters to create a more detailed table of contents, and to give explicit names to the sets of contiguous related chapters.

REFERENCES

Cosmides L, Tooby J. 1995. From evolution to behavior: toward an integrative evolutionary psychology. In: Wong R, editor. Biological perspectives on motivated activities. Norwood, NJ: Ablex. p 11–76.

Tinbergen N. 1963. On the aims and methods of ethology. Z Tierpsychol 20:410–433.

Sidney I. Perloe
Department of Psychology,
Haverford College,
Haverford, Pennsylvania
E-mail: sperloe@haverford.edu