

COMMENTARY

The Ethnoprimatological Approach in Primatology

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Recent and long-term sympatries between humans and nonhuman primates (hereafter primates) are central to the behavioral ecology, conservation, and evolutionary trajectories of numerous primate species. Ethnoprimatology emphasizes that interconnections between humans and primates should be viewed as more than just disruptions of a “natural” state, and instead anthropogenic contexts must be considered as potential drivers for specific primate behavioral patterns. Rather than focusing solely on the behavior and ecology of the primate species at hand, as in traditional primatology, or on the symbolic meanings and uses of primates, as in socio-cultural anthropology, ethnoprimatology attempts to merge these perspectives into a more integrative approach. As human pressures on environments continue to increase and primate habitats become smaller and more fragmented, the need for a primatology that considers the impact of human attitudes and behavior on all aspects of primate lives and survival is imperative. In this special issue, we present both data-driven examples and more general discussions that describe how ethnoprimatological approaches can be both a contribution to the core theory and practice of primatology and a powerful tool in our goal of conservation action. *Am. J. Primatol.* 72:841–847, 2010. © 2010 Wiley-Liss, Inc.

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INTRODUCTION

The human–primate interface is going to be among the most important areas of primatological focus in the 21st century. With continued expansion in human population densities, increased clearing and alteration of forested habitats, and the associated decrease in available ranging areas for primates, there will be a continued increase in spatial and ecological overlap between humans and our nearest relatives. At the same time, in many areas of Asia, South America, and Africa, humans and other primates have shared ecosystems for millennia [Hahn et al., 2000; Harrison, 1996], with some primate species doing better than others in these scenarios. Understanding which primates are best able to interface with human populations and anthropogenic landscapes and why they are able to do so, is a burgeoning frontier for primatology. Recent work on the human–macaque interface [Lane et al., 2010; Sha et al., 2009] and overviews of the relationships between humans and neotropical primates in Amazonia [Cormier, 2006] demonstrate that this approach can provide substantive data sets, illuminate multiple aspects of human–other primate interfaces, and contribute to the overall primatological toolkit.

Traditional socioecological models used in assessing primate behavior rely on female distribution, patterns of competition (scramble vs. contest), presence/distribution of predators, resource availability, and forest structure/composition [Strier, 2006], all of which can be substantially impacted by a range of anthropogenic processes. Alteration of forest structure, mammalian biomass, and floral composition of habitats, may directly impact the basic ecological constraints that we generally invoke in socioecological explanations. It is vital to view these interconnections as more than just “interference” with, or perturbation of, a “natural” state [Burton & Carroll, 2005]. Rather these may be

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drivers for specific behavior patterns and or shifts that we observe in primates, and what we consider “normative” behaviors for primates are in fact in part stimulated by specific anthropogenic contexts.

The assumption that most primate populations have never been influenced by or been forced to respond to human activities in their recent or evolutionary histories is incorrect. For example, given humans recent incursions into the Neotropics and longer term co-residencies in Africa and Asia, one might expect a more persistent or potentially different selective impact by humans on nonhuman primate evolution in Africa and Asia than in the neotropics [Fuentes, 2007b]. Madagascar would be a slightly different scenario because of the very large scale and rapid impact on human colonization on the mammalian faunas of the island. The few reports of curious or neutral behaviors exhibited by “naïve” nonhuman primates toward humans are a result of not having developed strategies to deal with human presence or threat [Morgan & Sanz, 2003; McLennan & Hill, this issue], and are extremely rare across all primate populations encountered. Recent and long-term sympatries between humans and nonhuman primates are central to the behavioral ecology, conservation, and evolutionary trajectories of countless primate species [Paterson & Wallis, 2005; Riley, 2007; Wolfe & Fuentes, 2007]. More importantly, there is an emerging consensus that this interface needs to be more elaborately documented to effectively facilitate primatological construction of models for the behavior and evolution of primate societies [Fuentes, 2006a; Fuentes, 2007a; Lane et al., 2010].

ETHNOPRIMATOLOGY IS IMPORTANT

Biological, phylogenetic, and behavioral relationships between humans and the other primates result in the two groups’ relationships having a special significance, ecologically, behaviorally, and evolutionarily [Fuentes & Wolfe, 2002; Riley, 2007; Riley et al., 2010; Wolfe & Fuentes, 2007]. The existence of primate wide trends in morphology and behavior, such as the core role of visual and tactile interactions, complex social relationships, and relatively large brain to body size ratios, suggest that the interface between humans and other primate species may differ from those between humans and other mammals [Fuentes, 2007b]. Historically, in Primatology, this interface is described almost exclusively as competition for space and resources, a contest between humans and other primates. Although competition does occur, it is an incomplete description of the interface, and the co-ecologies, of humans, and other primates [Riley & Priston, this issue]. The emerging approach termed Ethnoprimatology [Fuentes & Wolfe, 2002; Sponsel, 1997; Wheatley, 1999] is explicit in its acknowledgment of the multifarious nature of the human–other primate

interface. Rather than focusing solely on the behavior and ecology of the primate species at hand, as in traditional primatology, or on symbolic interpretations/uses of primates, as in socio-cultural anthropology and historical accounts [e.g. Janson, 1952; Ohnuki-Tierney, 1995], ethnoprimatology attempts to merge these two approaches, and others, into a broader and more integrative approach [Fuentes, 2006b; Fuentes et al., 2007].

ASPECTS OF ETHNOPRIMATOLOGY

Human ecologies and societies can influence, and be influenced by, the ecology and behavior of other primates. Crop raiding, fear of personal harm/attack, and habitat alteration by other primates can affect the livelihoods and nutritional statuses of humans. Human alteration of the landscape, human hunting, human religious belief, and even human pet keeping can affect the behavior and ecology of other primates. Bi-directional transfer between humans and other primates is well documented and we know that disease introduced by such exchanges can have dramatic effects on humans and nonhuman populations [Garber, 2008; Pusey et al., 2008]. Primate behavioral patterns are not just a result of one particular selective pressure or basic ecological constraint, but instead the result of interconnections with humans, changes in foraging, and patterns of individual behavior, all in the context of an anthropogenic environment. In this study, we provide overviews of different situations in which humans and other primates interact, highlighting that in order to conduct effective scientific analyses of any of these situations, we require a Primatology that includes anthropological factors and approaches: an ethnoprimatology.

Hunting of Primates

Primates are prey items for a diverse array of human cultures and are also captured by people for various human activities ranging from ingredients in traditional medicines to subjects of biomedical research. As relatively large mammals, especially in the neotropics, primates are a common choice for hunters [Alvard et al., 1997; Amman et al., 2000; Bowen-Jones & Pendry, 1999; Lizarralde, 2002; Shepard, 2002]. However, research suggests that humans do not take primates randomly nor solely in respect to optimal prey return models [Shepard, 2002]. In fact, it is common for human hunters to selectively hunt specific primates over others for cultural reasons [Cormier, 2002, 2003; Fuentes, 2002; Lizarralde, 2002; Parathian & Maldonado, this issue; Shepard, 2002]. Past research has demonstrated substantial behavioral and possibly morphological changes in primates due to extant or even past predation risks caused by nonhuman predators, including anti-predator behavioral responses, shifts

in feeding ecology and ranging, and habitat use [Miller, 2002]. However, aside from general impacts on prey densities and local extinction events, there are few studies that have attempted to model the impact of human predation on primate behavior, physiology, and morphology in a manner similar to the modeling of other animals' predation on primates [Alvard & Kaplan, 1991]. Differential hunting resulting in gender bias can alter the makeup of primate populations over generations and result in changes in dispersal patterns, such as which gender transfers, success rates of dispersal, and a potentially high rate of non-dispersal from natal groups which in turn can result in high rates of aggression [Fuentes et al., 2005]. Furthermore, noise, spatial restriction, and human activity cycles can also impact alarm and vigilance behavior in primates and thus potentially shift activity patterns [Hockings, 2009; McLennan & Hill, this issue].

Primates as Pets and in Entertainment

In areas of sympatry, ownership of select primate species is widespread with certain species targeted specifically for trade, particularly in immature individuals, and others as a by-product of hunting for food. In South America, nearly all of the species found in Amazonia are kept as pets by at least some indigenous groups [Cormier, 2006]. In contrast, the majority of pets owned in Sub-Saharan Africa belong to the genera *Chlorocebus* and *Cercopithecus*, and in Asia, macaques [genus *Macaca*] and lorises [genus *Nycticebus*] are common pets [Malone et al., 2002; Nekaris et al., this issue]. Apes are held as status pets in Africa and Asia, but have fairly low rates of survivorship in captivity and are quite expensive and energy intensive to keep relative to other primates. However, this does not deter ownership of great apes, and in some countries, such as Indonesia and Sierra Leone, the pet trade is probably one of the biggest threats to endangered populations [Kabasawa, 2009].

Cooperative human-monkey economic relationships also exist, for example in Thailand macaques (*Macaca nemestrina*) are trained to pick coconuts resulting in high economic returns for humans [Sponsel et al., 2002]. Sponsel et al. [2002] argue that cultural and agricultural systems have favored a move from conflict between humans and macaques over crops to a synergistic relationship wherein the humans capture, train, and maintain the macaques as they serve their economic role.

Economic exploitation by humans in allopatric contexts tends to be in the raising and use of primates as laboratory animals or circus performers/display animals. The laboratory and medical experimentation trade can be quite substantial. For example, according to the UNEP-WCMC CITES Trade Database over 1 million long-tailed macaques were imported into the United States alone between

2004 and 2008. The incorporation of primates into the cultural and economic practice of "monkey performance" is widespread across Asia, but also occurring in Northern Africa, and historically in Europe as well [Janson, 1952]. In Japan, the integration of economic and cultural roles for macaques results in a distinct and complex cultural relationship between humans and monkeys that exists at the same time that increasing conflict over land and crops emerges as a predominant pattern of interaction between humans and "wild" macaques in Japan [Ohnuki-Tierney, 1995; Sprague & Iwasaki, 2006].

Bi-directional Pathogen Exchange

Although it is generally assumed that human-primate infectious agent "sharing" has deleterious repercussions, our understandings of the patterns and contexts of these shared environments and their evolutionary implications remains rather incomplete [Engel et al., 2002; Jones-Engel et al., 2005]. Close contact and range overlap between humans and other primates introduce a very real and potentially dangerous situation of disease transmission [Engel et al., 2002; Fa, 1992; Jones-Engel et al., 2008; Wallis & Lee, 1999]. In these cases, humans risk exposure to a number of simian viruses, including simian T-cell lymphotropic viruses, simian retrovirus, simian foamy virus and Herpes B virus in addition to other known infectious agents [Engel et al., 2002; Jones-Engel et al., 2008; Wolfe et al., 2004]. It is also important to point out that primates are potentially at risk from human pathogens as well, including measles, influenzas, and other respiratory pathogens, such as parainfluenza and tuberculosis [Garber, 2008; Jones-Engel et al., 2001; Pusey et al., 2008]. Additionally, both humans and nonhuman primates can act as reservoirs for shared pathogens or potential pathogens that move across species boundaries, such as with SIV/HIV and Ebola [Cranfield, 2008; Rouquet et al., 2005]. [For more information, see special issue on "Disease transmission, ecosystems health and great apes research 2008." *Am J Primatol* 70: 715-1777, including articles by Boesch, 2008; Kaw et al., 2008; Lukasik-Braum & Spelman, 2008; Williams et al., 2008].

Impact of Habitat Alteration and Destruction

Human alterations of the landscape including deforestation, forest modification, and infrastructural development mostly have a negative impact on primates by reducing and isolating ranging areas and increasing the likelihood of direct human-primate contact and conflict [Campbell-Smith et al., this issue; Hockings et al., this issue; Hockings & Humle, 2009]. However, anthropogenic modifications can also enhance pathways between groups

in a population of primates. For example, the majority of macaques on Bali are found at sites associated with a temple or shrine [Fuentes et al., 2005], and many are food enhanced, whereby they receive some substantial or integral component of their nutritional requirements from humans or human activity [Fa & Southwick, 1988; Wheatley, 1999], especially if one includes crop raiding as food enhancement. It appears that specific land-use patterns and agriculture combined with the complex temple and irrigation systems of the Balinese [Lansing, 1991] has resulted in a mosaic of forest corridors and islands that fit remarkably well with the macaques' patterns of habitats use, foraging, and dispersal [Fuentes et al., 2005; Lane et al., 2010].

Crop raiding and related resource exploitation patterns by primates are the traditional reference point for human–primate interactions [Paterson & Wallis, 2005], but in these analyses, the perspective is almost always about the damage or disturbance to humans, rather than the behavioral ecology of the primates. Sympatric primate populations may prey on human agricultural lands resulting in increased time spent by humans in protection of the fields and potentially decreased yields per human labor effort, and other unquantifiable opportunity costs [Campbell-Smith et al., this issue; Riley & Priston, this issue]. In an opposite context from hunting, food enhancement via a variety of means, including direct or incidental provisioning and crop raiding, can facilitate a reduction of food stress and at the same time increase risk of injury or attack [by humans or guard species] creating different patterns of chronic vs. acute stress response. Additionally, whether foods are being exploited as fallback or preferred items [Hockings et al., 2009; Naughton-Treves et al., 1998], they are likely to change the activity patterns, behavioral profiles, and demography of primates [Hockings et al., 2006, 2007; Sapolsky & Share, 2004].

Impact of Tourism and Research

It has long been held that researchers or tourists that follow a primate group may impact their behavior in a number of ways [Cipolletta, 2004; Klailova et al., this issue; Wrangham, 1974]. Growing interest and concerns over primate eco-tourism projects mean that a complete understanding of our impact on primates' behavior and health is required in order to make sufficient cost–benefit analyses. In addition, the process of habituation might inhibit predation on those groups or even facilitate it. Furthermore, the habituation of primates for tourism and research purposes can pose ethical problems, especially in anthropogenic environments [Doran et al., 2007; McLennan & Hill, this issue], where a loss of fear toward humans might increase aggressive interactions [Hockings et al., this issue] or researcher

presence might give primates more confidence and security when crop raiding.

CALL FOR ACTION IN ETHNOPRIMATOLOGY

Although ethnoprimateology can be studied purely for theoretical interest, one of its key goals is to contribute to conservation and management efforts or at least slow population declines and/or facilitate population recovery, while also contributing toward approaches that include recognition of the roles for economic security and cultural contexts for local peoples who interface with the primates being studied [Lee, this issue; Wallis & Lonsdorf, 2010]. The importance of a holistic understanding of human–primate interactions is vital for conservation techniques, including among others, environmental education [Parathian & Maldonado, this issue; Savage et al., 2010], and conflict resolution/mitigation strategies [Campbell-Smith et al., this issue; Hockings et al., this issue; McLennan & Hill, this issue]. Simple guidelines can often be followed to maximize the conservation value of research [Caro, 2007; Hockings & Humle, 2009]. For example, ensuring that research includes the human and nonhuman primate aspects of specific conservation problems combined with efforts to complement any other ongoing conservation efforts is essential. To this end, working in threatened or disturbed habitats will provide information on how primates respond to threat, and working on a threatened species will help gain people's attention. Simultaneously, working with less threatened species [i.e. long-tailed or rhesus macaques] in urban and rural areas with high human–other primate interactions can also inform us about how intensive overlap of space can be negotiated by humans and other primate species; sometimes in a relatively sustainable fashion. Comparing across conditions and disseminating clear results and suggestions to people at the conservation front-line is invaluable, as well as increasing media and public awareness of conservation issues. Ethnoprimateological approaches are both a contribution to the core theory and practice of primatology and a powerful tool in our goal of conservation action.

OVERVIEW OF THIS SPECIAL ISSUE

The special issue in this volume of the *American Journal of Primatology* presents a set of articles that focus on the human–other primate interface and demonstrate the vibrancy and engagement of the emerging field of ethnoprimateology. Readers are presented with both specific data-driven examples and more general commentaries on ethnoprimateological situations around the globe. Our goal is to (1) continue the push to make ethnoprimateological approaches central to general primatology by

bridging disciplines that normally go their separate ways, (2) to provide examples as to how such research programs are undertaken, (3) to entice members of the primatological community to consider the potential for ethnoprimateological practice as part of their own research programs, and (4) to provide information on how ethnoprimateology can contribute to conserving primates.

Riley and Priston provide a detailed overview of the cultural and ecological facets of human–macaque interactions in Indonesia. They discuss the multiple factors that come into play when understanding macaque crop raiding in Sulawesi including how traditional cultural perceptions of monkeys can come into conflict with historical and more current economic factors. Parathian and Maldonado provide a comparison of both hunting and conservation practices in two areas of the Amacayacu NP, Columbian Amazon, while discussing Tikuna social and cultural practices. This piece highlights how people's perceptions, attitudes, and behaviors directly influence primate densities and the success of conservation practices. Campbell-Smith et al. discuss local attitudes and perceptions toward crop raiding by orangutans (*Pongo abelli*) and other primates at two human-impacted sites in Sumatra, while emphasizing the importance of integrating human needs into the design of human–primate conflict mitigation programmes. Nekaris et al. document international and regional trade levels of slender and slow lorises (*Loris & Nycticebus*) throughout South and Southeast Asia in an effort to understand inter-regional/country differences in the use of lorises for social and cultural practices (as pets and in medicine) and how this relates to traditional stories and folklore. Hockings et al. describe the circumstances surrounding attacks on local persons by chimpanzees (*Pan troglodytes verus*) at Bossou, Republic of Guinea, and incorporate the perceptions of some families directly affected by chimpanzee attacks. Suggestions for reducing future primate attacks on people are presented in an effort to mitigate human–primate conflict situations. Klailova et al. explore the implications of tourism programs on western lowland gorilla (*Gorilla gorilla gorilla*) behavior at Bai Hokou, Central African Republic, evaluating the impact of tourist presence, tourist numbers, team size, and observer distance. McLennan and Hill report the behavioral responses of a chimpanzee community (*Pan troglodytes schweinfurthii*) living in an anthropogenic landscape at Bulindi in Uganda to researchers, and evaluate the costs and benefits of habituating such communities of great apes for tourism as a means of increasing local tolerance for them through local income generation. Hill and Webber explore how people view and respond to certain kinds of primate behaviors, and how this affects their willingness to tolerate coexistence with primates. The authors

present two case studies that demonstrate the value of understanding local social constructions of “pest” animals when exploring the range of possible conflict mitigation options appropriate to any particular site or conflict scenario. With the use of specific long-term studies as examples, Lee discusses the role of ethnoprimateology in the global conservation of primates inhabiting agricultural–forest ecotones, while examining human–primate interactions from an ecological–economic perspective.

It is our hope that this volume will facilitate a wide acceptance of the perspective that ethnoprimateological approaches are core to our practice and should be considered as a central facet of the primatological practical and theoretical toolkit.

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