

**Aping Ethics:**  
**Behavioral Homologies and Nonhuman Rights**  
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**Introduction**

“He who understands the baboon,” penned Charles Darwin, “will do more towards metaphysics than Locke ” (Darwin and Barrett 1987). Darwin’s wry assessment appears in a private journal from 1838, and it reveals much more than the young biologist’s distaste for philosophical speculation. His success as a theoretician derived from decades of painstaking observation and empirical study, and it was these methods in which he invested full faith. Among Darwin’s greatest insights was that scientific study applies as much to human affairs as to the natural world—in short, that philosophers might benefit from a little biology.

Today, the behavioral sciences provide perspective to philosophers that is just as important and infinitely more nuanced. At one of the more salient junctions of their disciplines, philosophers and biologists are taking more seriously the question of our obligations to non-human beings. It is rapidly becoming an unavoidable conclusion that animals share with humans not only common ancestors, but a common suite of behaviors and mental experiences. This is especially true of humans’ closest relatives, primates such as the chimpanzee and bonobo. Indeed, behavioral research has unmasked beneath simian faces perhaps the most human quality of all: a moral faculty.

It goes without saying that there is no clear consensus on whether animals meet the criteria for moral worth—quite to the contrary, there is substantial disagreement over what the criteria ought to be. This conflict has deep historical roots. Jeremy Bentham, the father of utilitarian philosophy, argues that the key issue concerning animal welfare is not “Can the *reason*, nor Can they *talk*, but Can they *suffer*?” (Bentham, Burns et al. 1996) Bentham’s mantel is worn today by Peter Singer, who advocates for the rights of animals on precisely these grounds, but his approach is by no means universally accepted. Immanuel Kant, a representative of the deontological tradition in philosophy, disposes of the matter by declaring that “Animals are not self-conscious and are there merely as a means to an end” (Kant 1999). Kant’s position is apparently that a being

must have the cognitive capacity to experience a moral wrong in order to enjoy the protection of moral rights. This view is well represented today, although authors on both sides of the fence disagree over which cognitive abilities ought to count.

Especially since the 1975 publication of Singer's *Animal Liberation*, there has been a vibrant and complex debate over the philosophy of animal rights. During the same period of time, jump-started by works such as Don Griffin's *Animal Consciousness*, Frans de Waal's *Chimpanzee Politics* and Premack and Woodruff's classic paper on primate "theory of mind," the cognitive sciences have witnessed an explosion of research on the nature of non-human minds and social behavior. This essay will not attempt to provide definitive answers for either the philosophical or biological debates, but rather to facilitate communication between them. Given certain philosophical questions, what biological or psychological facts can be brought to bear on the question of animal rights?

First, in answer to Bentham's challenge, I consider the question of animal suffering. Do animals experience pain? In what ways is it similar to human pain? Do they merely experience pain, or are they reflectively aware of it? Next, I consider whether animals experience moral sentiments. Do they self-reflect as moral beings? Do they hold their peers morally accountable? Do they categorize actions as right and wrong? At each nexus between philosophy and science a common theme emerges: humans out to be taking far more seriously the moral standing of other animals, and non-human primates in particular.

## **I. Pain and Suffering**

Peter Singer, the preeminent philosopher of animal rights, takes Bentham's lead, declaring that "the limit of sentience (using the term as a convenient, if not strictly accurate, shorthand for the capacity to suffer or experience enjoyment or happiness) is the only defensible boundary of concern for the interests of others." If Singer and Bentham are correct that the critical issue at stake is whether animals suffer, and if physical pain is one form of suffering, then the matter is solved, for there are certainly animals besides humans that experience pain.

The case for pain in nonhumans is so strong because of the concordance of two lines of evidence: physiological and behavioral. If humans shared only the neurological

mechanisms of pain with other vertebrates, it might be written off as a homologous structure (an adaptation of an identical structure to different tasks), and there would still be substantial uncertainty whether the similar neurological mechanisms caused identical perceptual experiences. Likewise, if only certain behaviors were shared, it might be argued that they are analogous behaviors of independent origin and, once again, potentially linked to different perceptual experiences. Yet among nearly all vertebrates, shared physiological structures are associated with strikingly similar perceptual inputs and behavioral responses. Nociception, the process by which noxious stimuli are detected by peripheral neurons, is present among all vertebrates and some invertebrates (Wise 2000). The parts of the brain responsible for processing pain are present in nearly all vertebrates and are highly conserved among the closest relatives of humans. While the human brain has undergone rapid and significant evolution since human and chimpanzee lineages diverged, most of this development has occurred in other parts of the brain devoted to higher-level reasoning, not perceptual experience (Singer 1975). Furthermore, most vertebrates exhibit similar responses to stimuli, exhibit the same anxieties, and employ the same avoidance mechanisms as humans.<sup>i</sup> Simply put, there is little reason for us to doubt the existence of pain in many nonhuman animals besides the sort of brute epistemic skepticism that doubts if even fellow humans experience pain. Such skepticism has an appropriate place in philosophy, but strongly violates the principle of parsimony, which guides experimental science.

At least in higher-order vertebrates, the conclusions reached above generalize to mental states with more emotional content than physical pain, such as fear and depression. Studies of the neurochemical and environmental interactions leading to mental distress and disorder in humans often depend on the use of laboratory animal models precisely because the relationship between experience, brain and behavior observed in humans holds true, at some reasonable level, for other vertebrates as well.<sup>ii</sup> When deprived of a social environment, even the laboratory mouse—by no means a Goliath of the mental world—exhibits marked physiological and behavioral changes including defects in learning ability, hormone levels and brain neurochemistry (Valzelli 1973). The concordance of physiological and behavioral evidence suggests that it is not

only appropriate to attribute emotional content to the mental states of many animals, but justified and relevant to the debate on animal welfare.

Some philosophers insist, however, that the experience of pain is not enough—that a higher order processing of experience is requisite for moral consideration. Awareness, consciousness and self-reflection are frequent candidates for this higher order mental state. Definitions of these terms are often contradictory, or absent altogether, but this may not reflect intellectual sloppiness so much as the blurred lines of the natural world. For the sake of rigor, I will set the bar as high as possible: for the experience of pain to count, the animal must be able to reflect on its own position as an individual experiencing pain. This is the position adopted by the philosopher Peter Carruthers, for instance.

The litmus-test of an animal's sense of self is an elegant experiment devised in the 1970s by Gordon Gallup, in which subjects are surreptitiously marked with a red dot on one eyebrow and one ear and then exposed to a mirror. Human infants under the age of two and most monkeys will not spontaneously touch the marked area while looking in the mirror, suggesting that they do not recognize the image as a representation of the self.<sup>iii</sup> Older children and most adult great apes pass the mirror test, however, first touching the marked areas while looking in the mirror and subsequently using the mirror to investigate normally unobservable parts of the body. Among a few great apes who have learned sign language, individuals such as Washoe and Nim have signed "me" in response to their own reflections (Wise 2000). The ability of many great apes to recognize their own reflection is our best evidence yet that they can form an abstract representation of themselves as physical and causal agents. Not only can they perceive their own body, they appear to conceive of it (Povinelli and Cant 1995).

Whether animals are aware of themselves as mental beings is a far trickier question. Current experimental methods are unable to explore the precise content of an animal's beliefs about itself. Rather, research over the last 25 years has centered around the question of whether animals have knowledge of *other* animal's mental states. In 1978 Premack and Woodruff claimed to have answered this question affirmatively, based on research with their chimp Sarah. The issue continues to be hotly debated, and experts within the field have not reached consensus (Heyes 1998). I will directly address the

evidence for a theory of mind in some nonhuman primates in the following section; suffice it to say for now that the question is open. Nor it is obvious that a theory of *others'* minds presupposes a theory of one's *own* mind. Protocols that more directly measure primate self-awareness are necessary.

These shortcomings notwithstanding, it is likely that Bentham's acid test of suffering is easily met by many non-human animals. The experiential phenomenon of physical pain is almost certainly shared between diverse taxa of vertebrates. In higher vertebrates, it appears to determine behaviors in a manner very similar to human pain. Moreover, despite lingering uncertainties, it is at least a defensible position that our closest relatives can reflect on their own experience of pain. Yet, while these empirical facts have proven more than sufficient to convince a number of philosophers that animals deserve moral consideration, plenty of critics remain. A common assertion is that moral rights should only be granted to those organisms who can experience violations as morally wrong. The remainder of this essay undertakes to demonstrate that some primates meet even this stringent criteria.

## **II. The Moral Faculty**

Recent reviews of morality among nonhuman animals have focused on the distinction between moral agents and moral patients. A normal human adult is a moral agent: somebody not only worthy of moral consideration, but capable of moral reasoning and beholden to moral behavior. A human infant, on the other hand, is a moral patient: somebody still deserving of moral treatment, but incapable of reasoning morally and therefore not morally culpable. It is often argued that animals are moral patients, but not moral agents.<sup>iv</sup>

Unfortunately, the agent/patient distinction is often conflated with a different question: whether animals possess any moral faculty. The distinction is subtle, but important. Some critics have falsely reasoned from the appropriate claim that animals are not moral agents equivalent to humans to the dubious assertion that animals are incapable of moral reasoning at any level. To be sure, no nonhuman animal can engage in the sort of abstract moral reasoning typical of even the least educated human, and thus it is unlikely that any nonhuman animal would qualify as a moral agent in human society.

Ultimately, however, I consider the agent/patient distinction to be the domain of philosophers—an interesting question, but one unanswerable by scientific methods. On the other hand, the question of whether animals have any moral faculty falls squarely to empirical scientists. Rather than letting the philosophical question of moral agency in animals define the empirical question of a moral faculty in animals, I advocate the opposite approach. As with all domains of cognition, the moral faculty need not be an all-or-nothing proposition. It is not enough to claim that animals do not experience morality in a sufficiently human way for agency; the question is how, if at all, they experience morality at all.

To date, attempts to provide an answer have too often ignored the evolutionary perspective that, as Darwin recognized, is fundamentally important to all biological research. To find moral sentiments in animals, researchers must look at behaviors that have evolved in the environment of typical social interactions, not those induced in contrived laboratory settings.

The debate over theory of mind in nonhuman primates, arguably a prerequisite for the experience of moral sentiment, is illustrative of the importance of an ethological perspective.<sup>v</sup> Dozens of experimental and observational procedures have been used to assess theory of mind in nonhuman primates. Many of the most credible ones involve deception or imitation. If animals are capable of deliberately lying to each other, this might suggest they can abstractly represent others' mental states. Likewise, if animals have the ability to teach and to learn from such instruction, this might suggest the ability to recognize another's intentions and states of knowledge.

Anecdotal evidence from field ethologists has indicated for decades that chimpanzees have many of the hallmarks of a theory of mind: behaviors like deception and teaching, which indicate that chimpanzees attribute mental states such as perception, knowledge and belief to members of their own species.<sup>vi</sup> A striking example is the chimpanzees of West Africa, where juveniles learn from their parents how to use stone anvils and hammers to crack nuts. The evidence is strongly against this behavior being innate; rather, it appears to be culturally transmitted. Most striking of all, in a few rare cases proficient chimpanzees have been observed actively teaching their offspring—correcting inappropriate behavior, demonstrating the proper technique and even

repositioning the tools in the hands their "pupils". Although decades of observation have only yielded a handful of these breakthrough observations, there is evidence of similar behavior in other taxa. Researches have observed killer whales teaching their young how to stalk and capture prey, and vervet monkeys appear to teach juveniles how to sound situation-specific alarm calls by rewarding correct calls and punishing incorrect ones (Caro 1992; Rendell and Whitehead 2001). Significantly, these behaviors are manifested only towards naïve individuals. Field observations of deception are much more numerous, spanning a variety of situations in a diversity of species (Byrne and Whiten 1988). Observations of learning and deception indicate that chimpanzees and other species are able to form judgements about what their peers know and do not know, and modify their behavior in order to supply or withhold key information (de Waal 2001). Yet behavioral research in the lab has largely failed to duplicate field observations of teaching, deception, and other behaviors indicative of a theory of mind, leading to a widespread doubt that nonhuman primates possess the cognitive capacity.

The disparity between ethologists and experimentalists is rooted in the failure of laboratory settings to replicate the natural conditions of the animal test subjects.<sup>vii</sup> For instance, Daniel Povinelli has run numerous experimental procedures to discern whether chimpanzees have the concept "to see" (Povinelli 2000). The chimps have failed, but always at unnatural tasks that require atypical behaviors (pointing, for instance) and demand the chimps to apply a theory of mind to human experimenters. In sharp contrast, Brian Hare recently published a breakthrough study involving food competition—a natural setting—in which the subjects had to apply the "too see" concept to members of their own species (Hare 2000). Hare's chimpanzees passed the theory of mind test with flying colors. Not only did the subjects use knowledge about each others' mental states, they were able to apply this information in order to subvert the desires of dominants. As Hare's work demonstrates, the evidence for a theory of mind in many nonhuman primates is very strong, when looked for in the appropriate places (Wise 2000). Cognitive scientists must remind themselves that theory of mind is not an emergent property of mega-minds, but a mental tool evolved for social behavior in the natural environment.

The same errors that plague research into theory of mind among primates also permeate the literature on animal morality. As a consequence, researchers attempting to

locate moral agency in animals have uniformly come up short—the best candidates for moral behavior, they claim, are nothing more than specific, domain-specific solutions adaptive problems in social life. True moral agency, they assert, requires the ability to abstract ethical principles to novel situations. This approach fails to recognize two key points, however. First, animals may experience moral sentiments without being capable of moral agency. Second, nearly all behaviors are best explained as adaptive responses to specific problems, and just as with theory of mind, social interactions are precisely where researchers ought to be looking for moral sentiment.

A case in point comes from Marc Hauser's recent review of animal cognition, *Wild Minds*. Hauser maintains that, among other shortcomings, animals do not have the inhibitory control necessary for moral agency (Hauser 2000 and personal communication). Hauser is probably correct that animals do not have the inhibitory control necessary for moral agency in a human context, but this does not mean that they cannot experience moral sentiments. In any event, his claim is an instructive example of how previous attempts to locate animal ethics have looked for the wrong behaviors in the wrong places. Hauser bases his argument on experiments in which chimps cannot inhibit innately programmed actions, such as reaching for the larger of two piles of food, even when consistently punished for the behavior by being given the smaller pile. But is this truly the kind of inhibition necessary for moral behavior? It seems rather like criticizing humans for not being able to inhibit the kicking response when tapped on the knee.

As a foil, consider an experiment by the ethologist Eduard Stambach. The lowest ranking members of several macaque groups were rewarded with large quantities of food for correctly pressing a sequence of levers on a machine. Once the low ranking animals learned the sequence, they were released into their social group with the machine and with other animals that were naïve with respect to the appropriate sequence. Initially the dominant members tried to gain exclusive access to the levers, but upon discovering that the levers would not work for them, the dominant members relinquished access. Their next strategy was to allow the low-ranking members to access food, but then to immediately chase them away and claim the full reward. In response, the low-ranking members went on strike, refusing to provide any food. Finally, the high-ranking members began to groom and coddle the low-ranking members, "inhibiting all

aggression," in Hauser's words, and sharing the rewards with the low-ranking members (Hauser 2000).

If nothing else, these results demonstrate that some primates can inhibit reaching for large piles of food. The result also indicates that this capacity may not be domain-general, but rather specific, revealing good control in some contexts and poor control in others. But there is a broader methodological point. As with the theory of mind experiments (to which this research is also very applicable), to elicit a typical behavior it is necessary to employ protocols that put subjects in a natural, social setting with conspecifics.

Hauser objects that cases of inhibition such as these simply represent animals' "innately specified expectations about ... the general psychology of members of their social group," which "evolve as the result of statistical regularities." From an evolutionary perspective, however, this isn't an objection, but rather the main point! Of course morality—the innate expectations of permissible and impermissible behavior—evolved as the result of statistical regularities of behavior. Hauser concludes from his discussion of inhibition that the innate rigidity of animal minds "won't work with the general goals of a moral society" that might, for instance, have to "facilitate the greatest good for the greatest number" (Hauser 2000). While he is certainly correct that animals cannot perform on this intellectual plane, this only goes to show why the category of moral agency creates confusion and evades the more fundamental issue of whether animals have a moral faculty.

Animals are not fully capable moral agents in human society, but this does not mean that they lead amoral lives. Rather, social interactions between animals demonstrate a rich variety of social rules, norms and expectations that strongly indicate a sense of right and wrong. Rhesus macaques expect members of their social group to call out when they discover food, and silent members are punished without regard to rank on the social hierarchy. By contrast, individuals exterior to the social group never call, and are never punished when the group learns of their discovery (Hauser 2000). A fascinating experiment with a chimpanzee named Sheba involved two groups of humans bringing her juice. One group accidentally spilled the juice, while the other deliberately threw it on the ground. In apparent anger Sheba would threaten the intentional spillers,

but she did not react angrily to the accidental spillers. Given a choice in future trials, Sheba would request juice from accidental spillers over intentional spillers (Povinelli and Godfrey 1993). David Premack's chimp Sarah would, given the ability to choose outcomes to videotaped dilemmas, choose pleasant outcomes for her favorite keepers and unpleasant outcomes for her least favorite (Povinelli and Godfrey 1993). Nor is punishment the only outcome of moral conflict; reviewing the research on peacemaking among primates, Hauser writes "many primate societies have evolved systems to reduce the day-to-day tensions of living a life in the company of others. This system is certainly an important part of getting along in a society with rules" (Hauser 2000).

Are these cases of animals responding with moral indignation? Since it is impossible to solicit a first-hand account, we cannot know for sure whether Sheeba's threats against deliberate spillers, for instance, are accompanied by a sense of having been wronged, or simply represent an innate reflex, devoid of any moral content. But when the cases of consciousness, pain, and suffering seem obvious, why not bridge the identical epistemic gap in the case of morality? Animals are morally wronged (that is, expected norms are violated), and consequently behave as if they *felt* morally wronged. Why deny the moral experience?

Perhaps the most important shortcoming of the excuse that animal emotions are "merely" adaptive responses to social life is simply that human moral sentiments are best explained adaptively as well. Moral agency may depend on rational thought that transcends innate emotive responses, but moral intuitions about fairness and basic social rules are apparently hard-wired in the human mind.<sup>viii</sup> Psychologists and behavioral economists have synthesized data from more than a dozen primitive cultures on fairness in economic interactions. Strikingly, individuals seem to have a concept of fairness that, from an economic perspective, is irrational. Although cultural determinants predict much of the variation between individuals, it appears that variation hovers around a mean innately determined, rather than rationally derived (Henrich, Boyd et al. 2001). As such, the cross-cultural concepts of economic fairness underlying these observations might best be explained as domain-specific adaptations for social behavior. These moral intuitions are precisely the ones which cognitive and ethological research increasingly find evidence for in our closest primate cousins.

There are at least two replies to this argument worth careful consideration. Hauser frequently makes use of the distinction between domain specific and domain general abilities (Hauser 2000). Whereas humans can apply cognitive skills to a variety unfamiliar of tasks, comparable skills in animals have typically evolved only in the narrow domains that applied to their daily lives during the relevant adaptive history. I suspect Hauser's complaint that apparently moralistic attitudes in animals are merely evolved social expectations to be rooted in his conviction that human morality depends on its generality across novel social interactions.<sup>ix</sup> In my view, however, moral feelings are moral feelings whether they apply generally or specifically. We should not expect chimpanzees to have the capacity for human moral behavior any more than humans can be expected to behave according to "chimpanzee politics," as Frans de Waal termed them. But we should recognize chimpanzee politics for what they are: a moral system, albeit one more primitive. Nor should we forget that our own moral emotions, however generally applied, probably first evolved as domain specific adaptations for social life.

A second objection is that the "argument by analogy" is simply insufficient.<sup>x</sup> What distinguishes the observation of apparently "moral" behavior in primates from the foolhardy anthropomorphism of dog lovers who claim that "virgin bitches 'save' themselves for future 'husbands'," assuming "Victorian values in an animal not particularly known for its sexual fidelity"?<sup>xi</sup> The best response to this criticism is to point to the rapidly mounting evidence that great apes (but, by and large, *not* monkeys) possess a theory of mind and have the capacity to deceive, punish, inhibit and reward. They have complex social interactions governed by rules but also characterized by flexibility. They recognize the boundaries of their social groups, form friendships and enmities, make peace and make war. The argument by analogy is inescapable, at least so long as animal communication remains inadequate for first-hand accounts, but it is an argument gaining in strength year by year and study by study.

It bears repeating that no animal displays even a pale image of the colorful range of moral sentiments in humans. Determining whether animals have the right kinds of moral faculty for true agency is a matter of philosophy, not biology. Nevertheless, biology can contribute an important insight to the debate: as both experimental and evolutionary psychology dig closer at the roots of the moral faculty, the experiences of

humans and animals appear more and more similar in kind, if separated by a chasm of degree.

## **Conclusion**

In the 1960's, Stanley Wechkin and a group of colleagues investigated empathy and altruism among rhesus macaques (Wechkin 1964). One monkey, the actor, was trained to pull on either of two chains to receive food. Then another monkey, the receiver, was introduced in an adjacent cage, while the actor's chains were rewired. One chain would still deliver food to the actor, but the other administered a shock to the receiver. Most monkeys substantially reduced the number of pulls to the shocking chain. Several monkeys stopped using either chain; one starved itself for 12 days before it would pull either chain. Monkeys who had been shocked before were significantly less likely to shock their neighbors, as were monkeys with prior social contact (Hauser 2000). In short, these macaques seem to behave according to the golden rule.

Before presenting this data, Marc Hauser writes, "The fact that I discuss this work should not, however, be read as an endorsement. It is most definitely not." He later comments, "For many, the experiments described above are unethical because we should not harm animals for our own intellectual benefit" (Hauser 2000). Some philosophers take this reasoning to be sufficient: if animals experience pain, we ought to avoid causing it. Others demand that the animals in question not only experience pain, but experience the "rightness" and "wrongness" of actions. Their question is this: does the actor macaque who avoids shocking the receiver want the receiver not to experience pain in the same way that Marc Hauser does not want the receiver to experience pain?

There are many reasons for the actor to avoid shocking the receiver that make no appeal to right and wrong. Perhaps actor monkeys are frightened by the abnormal contortions of their shocked neighbors. Perhaps they are afraid they will be shocked, or fear long-term retribution, or simply act reflexively to avoid pain in conspecifics. But I believe that these explanations do not best account for the data. They ignore the adaptive roots of moral behavior and the evolutionary ties which bind us to our primate cousins. When we look closely at human morality, we see sociality; when we look closely at primate sociality, we see morality. Indeed, the best explanation for these data is provided

in *The Decent of Man* by Darwin, whose clairvoyant musings on evolutionary biology continue to astound modern researchers. Darwin recognized the fundamental unity between animal social instincts and human moral instincts as well as the inherent limits of the comparison, and so to him I give the final word:

"The moral sense perhaps affords the best and highest distinction between man and the lower animals; but I need say nothing on this head, as I have so lately endeavored to show that the social instincts—the prime principle of man's moral constitution—with the aid of active intellectual powers and the effects of habit, naturally lead to the golden rule, 'As ye would that men should do to you, do ye to them likewise'; and this lies at the foundation of morality " (Darwin 1974).

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<sup>i</sup>*Animal Experimentation: Report by the Senate Select Committee on Animal Welfare*. the Australian Government Publishing Service: Canberra (1989). Pages 44-48.

<sup>ii</sup>"Emotional events in young mammals can have major, long-lasting effects on the neurochemistry of the developing brain—and therefore on mood and behavior." Mlot, C. (1998). "Probing the biology of emotion." *Science* **280**(5366): 1005-7.

<sup>iii</sup>But see Hauser, M. D., J. Kralik, C. Botto, M. Garrett, and J. Oser (1995). "Self-recognition in primates: Phylogeny and the salience of species-typical traits." *Proceedings of the National Academy of Sciences* **92**: 10811. , which suggests that cotton top tamarins pass the mirror test, and that monkeys may fail for methodological reasons. Hauser's observation that subjects may simply be uninterested in minor markings on their own body may explain why even some chimps do not pass the mirror test.

<sup>iv</sup>See, for instance, Hauser, M. D. (2000). *Wild minds : what animals really think*. New York, Henry Holt. and Petrinovich, L. (1999). *Darwinian Dominion*. Cambridge, MIT Press..

<sup>v</sup> The argument is commonly made that animals cannot experience moral indignation at each other without a concept of the "other" as a mental being.

<sup>vi</sup> For a brief, general defense of the ethological approach, see Green, S. M. (1998). "Anecdotes, omniscience and associative learning in examining the theory of mind." *Behavioral and Brain Sciences* **21**: 122.. For a review of animal deception see Whitten, A. and R. W. Byrne (1988). "Tactical Deception in

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Primates." Behavioral and Brain Sciences **11**: 223-273.. For reviews of chimp teaching and learning see Whitten, A., J. Goodall, et al. (1999). "Culture in Chimpanzees." Nature **399**: 682-685. and de Waal, F. B. M. (2001). The ape and the sushi master : cultural reflections by a primatologist. New York, Basic Books..

<sup>vii</sup> I focus on the ethology/laboratory division, but Premack and Premack make important points about methodological errors in current theory of mind empirical protocols. See Premack, D. and A. J. Premack (2003). Original intelligence : unlocking the mystery of who we are. New York, McGraw-Hill..

<sup>viii</sup> This comment will inevitably strike some as obvious as others as absurd; hopefully both camps will accept, however, that it is fruitless to argue the point anew in this essay. For a comprehensive defense of the statement, see Darwin, C. (1974). The descent of man and selection in relation to sex. Detroit, Gale Research Co., Wilson, E. O. (1975). Sociobiology. Cambridge, Harvard University Press., and Wright, R. (1994). The Moral Animal. New York, Vintage Books..

<sup>ix</sup> Eliot Sober has advocated a related position, well worth consideration. See Sober, Sober, E. (1993). Altruism, Egoism, and Morality. Evolutionary Ethics. D. V. Albany, State University of New York Press..

<sup>x</sup> See Povinelli, D. J., et al. (2000). "Toward a Science of Other Minds: Escaping the Argument by Analogy." Cognitive Science **24**(3).. While his argument is directed specifically at theory of mind, the methodological points apply generally.

<sup>xi</sup> See de Waal, F. B. M. (2001). The ape and the sushi master : cultural reflections by a primatologist. New York, Basic Books.. In my own view, the rampant anthropomorphization of dog behavior owes to extraordinary selective pressures operating on domesticated pet breeds to behave according to human social expectations. In short, we selectively breed dogs adept at making us believe they think like humans.