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Great Ape Mindreading: What's at Stake?

Kristin Andrews

For *Humans and Other Animals: Rethinking the Species Interface*. Annette Lanjouw and Raymond Corbey, eds. Cambridge University Press.

Introduction

Humans and other great apes are similar in so many ways. We share an extended immaturity and intense infant-caregiver relationships, group living situations, cultural transmission of technology, and many emotions and cognitive capacities. Yet the communities of nonhuman apes are also very different from human communities. Humans build lasting tools, and store them to use later. We build permanent sleeping and living structures. We cook our food. We have courts of law and prisons and ethics books. There are vast technological differences between humans and nonhuman great apes. What is it that accounts for such a difference? On one account, one central difference between humans and other apes is that only humans develop the ability to mindread, the ability to see that others have beliefs that could be true or false which permits joint attention and shared intentions. For example, Michael Tomasello takes mindreading (along with cooperation and having shared goals) that permits the development of cumulative culture, so that technological advances can spread through a society and future generations can continuously improve upon those advances (Tomasello 2008). And, Kim Sterelny suggests that our hominin ancestors thrived in an apprenticeship culture where naïve individuals were given the opportunity to learn from a master, and the master knew how to offer the apprentice the appropriate projects, tools,

and materials as her skill sets improved—which of course was facilitated by a developing mindreading capacity (Sterelny, 2012).

An idea that emerges is that only humans can be teachers, builders, or judges because only humans understand their own reasoning patterns and the evidence they have for their beliefs, and only humans realize this about others in such a way that allows them to form the collaborative projects needed for complex culture. This requires mindreading capacities and realizing that some of our beliefs turn out to be false, or lack evidence, while others turn out to be true. Retaining the true beliefs and discarding the false ones is a generally advantageous evolutionary strategy. And it is traditionally taken to be a requirement for an *autonomous agent*, one who acts deliberately, and hence is responsible for her actions. Autonomous agents are the only sorts of creatures who can truly be moved by moral norms.

In this paper I will offer an alternative account of the relationship between mindreading and the development of community social norms and individual autonomous agency. Mindreading is not needed for teaching, developing some cumulative culture, or agency. Rather, I have argued that the foundational role for mindreading is based in its usefulness for explaining behavior (Andrews 2009, 2012). It is the need to explain behavior that drove the evolution of mindreading, and this, in turn, required a prior understanding of social norms. Looking at the behavior of the nonhuman great apes in this light, it appears that the core elements required for agency are fairly well established in chimpanzee communities. One consequence of this position is that mindreading should not be a requirement for either moral or legal standing.

The benefits of mindreading

Mindreading is one aspect of a theory of mind. *Theory of mind* refers most generally to the ability to attribute mental states of various sorts to other to others. The interest in theory of mind was for a long time focused on the ability to attribute false beliefs to others (Dennett 1978; Bennett 1978; Harman 1978; Wimmer and Perner 1983), but now it includes understanding others' perceptual states (such as what others see or hear (Hare et al. 2000; Hare et al. 2003; Flombaum & Santos 2005; Hare et al. 2006; Melis et al. 2006; Kaminski et al. 2006; Lurz 2011)), goals (Uller 2004), intentions (Tomasello et al. 2005), or knowledge states (Hare et al. 2001; Kuroshima et al. 2002, 2003; Kaminski et al. 2008). What all these states share is their unobservable nature, so the story goes. Such mental states are purported to be theoretical entities whose existence must be inferred. While almost no one believes that apes can attribute propositional attitudes such as beliefs (Call & Tomasello 2008), many claim that apes can attribute some of these other mental states.

Despite the growing number of states of mind being investigated, most parties agree that attributing these states of mind is beneficial for predicting behavior, and that mindreading is particularly advantageous, since it permits the attribution of states of mind such as belief states which the attributor knows may be false. Having this ability allows one to try to manipulate a competitor by giving him a false beliefs, which would then lead the competitor to act contrary to his own interests (and, importantly, in the manipulator's own interests). The view has been recently described in this way: for mindreading to be advantageous, it must offer some benefit, and a benefit for a mindreading animal is knowing what other animals' behavior will be (Lurz 2011).

I aim to challenge the widespread assumption that the benefit of mindreading is in predicting behavior. Rather, since predicting behavior can be accomplished using a large variety of techniques that don't require thinking about what others think or believe, it is in explaining behavior in where mindreading offers an advantage (Andrews 2009; 2012). When one has an explanation for someone's behavior, one knows how to act appropriately given that explanation, and nothing could be more advantageous than that. Of course, once one have explained someone's behavior, it is possible to generate plausible predictions about future behavior, or at least to limit the domain of expected behaviors. But it is the understanding of the other individual, rather than a simple ability to predict, that offers the advantage. And some explanations of behavior can only be given in terms of their beliefs.

To illustrate, consider being approached by an individual who is talking to himself, acting jittery and otherwise appearing strangely. If you were to find this person aversive given his strange behavior, and move away, you haven't tried to understand him. Rather, you have just consigned him to the out-group. But if you were curious, and tried to understand his behavior by examining him more closely, you might see that he was using a cool new gadget, and by learning something about his reasons for his behavior, you learn something about new technology. So that is a contemporary example. Consider now our hominin ancestors before the discovery of cooking. Meat was gained at great effort, and so was presumably highly valued. Fire is destructive and would have been constrained as much as possible. Putting the two together might seem like a terrible thing to do. If our hominin ancestors ostracized the meat-cooker, rather than trying to understand his motivation for cooking, they would have lost out on the increased

nutrition cooked food offers. It is the willingness to allow individuals act anomalously, and to seek to explain their odd behavior, that would offer an evolutionary advantage. Note that many new technologies can be learned through the explanatory drive, without active teaching or apprenticeship, or the ability to explain behavior. Opportunity learning coupled with the drive to explain behavior could have led a juvenile hominin observing the construction of a hand axe to pick up a flint and examine its affordances. The hand axe becomes functionally transparent to him as he learns that it is sharp and can cut his flesh, without anyone needing to teach him. As improvements in tools are made, these new affordances can be discovered by examining the tools, coupled with observational learning when the tools are in use. Thus, cumulative culture can also occur without mindreading.

It is this drive to understand things in one's environment that likely led to the development of mindreading in humans. When the drive to explain is directed at other beings, mindreading is the natural next step. But there is an important move in this story that I have so far not emphasized, and it is this point that will be the focus of the remainder of the paper. In both examples, someone was acting oddly. It is odd behavior that we seek to explain; there is no need to explain normal behavior. Here comes the important step: to realize some behavior is worth explaining is to realize that it is not normal, and this requires an understanding of what is normal, or what individuals should be doing. It requires some understanding of social norms. Now of course not all statistical regularities are social norms; using your left hand to eat will not lead others in the West to seek an explanation, because there are no social norms against eating with the left hand for Westerners. However, in other cultures where there is such a prohibition,

and explanation would likely be sought (and offered). Those violations of statistical norms that are the typical subject of explanatory interest are the ones that indicate the existence of social norms. Among our hominin ancestors, there were likely social norms about the proper treatment of fire. The first fire-cooker had to violate a norm to innovate a new beneficial technology. And the others in the community had to recognize that he had violated a norm, and ask themselves why he did it, for the practice to catch on.

The upshot is that a society in which mindreading might develop is a society that already has social norms. But this claim might make some uneasy, for how could there be moral norms without moral, and hence autonomous, agents? And how could there be autonomous agents who don't mindread—or more specifically, who lack the ability to think about beliefs? I will turn to these questions now.

Agency and Mindreading

An autonomous agent knows that her actions have consequences, and she thinks she can affect change in the world through her actions. While accounts differ, as a foundation we can agree that "to be autonomous is to be one's own person, to be directed by considerations, desires, conditions, and characteristics that are not simply imposed externally upon one, but are part of what can somehow be considered one's authentic self" (Christman 2009). Put this way, an autonomous agent is contrasted with an individual whose every act is controlled by external forces, so an animal whose behavior was completely controlled by, e.g., fixed action patterns (such that all behavioral sequences are inflexible and determined by environmental stimuli) could not be an autonomous agent. However, an animal might be an autonomous agent if his behavior is

flexible and the result of internal cognitive processes rather than mere reflex or association with environmental stimuli. For such animals, the question would then be whether the internal processes are of the right sort.

There is a tradition in philosophy that would include mindreading (in terms of understanding belief) among the processes required. Christine Korsgaard illustrates this approach in her argument that animals lack autonomy. Because animals can't mindread, they cannot self-govern, i.e. they cannot decide whether an act is justified and then act from that judgment rather than from one's desire. She writes:

What it [normative self-government] requires is a certain form of self-consciousness: namely, consciousness of the grounds on which you propose to act *as grounds*. What I mean is this: a nonhuman agent may be conscious of it as *fearful* or *desirable*, and so as something to be avoided or to be sought. This is the ground of his action. But a rational animal is, in addition, conscious *that* she fears or desires the object, and *that* she is inclined to act in a certain way as a result. That's what I mean by being conscious of the ground *as a ground*. She does not just think about the object that she fears or even about its fearfulness but about her fears and desires themselves (Korsgaard 2006, 113).

The argument that autonomy requires mindreading could go like this: in order to have moral agency, one needs also to have autonomy. An autonomous agent is able to act for reasons. And since acting for reasons requires the ability to recognize *that* one has reasons for actions, and reasons for actions are sets of beliefs and desires that motivate behavior, it follows that acting for reasons requires mindreading (of one's self). Thus, the worry arises that the moral agent must understand belief, and if nonhuman animals lack the capacity they cannot be agents.

But, there are problems by setting the requirement so high. First, note that this requirement excludes human children and many adult humans as autonomous agents. On

this view, a moral agent has explicit knowledge of her reasons for action and the ability to analyze them. It would follow that children, who do not seem to understand belief until around 4 years old (Wellman et al. 2001), and who don't recognize some of the limitations of belief attributions until mid-childhood (Apperly & Robinson 2001; 2002; 2003) are not autonomous agents. Worse yet, until adolescence humans are unable to evaluate the reasons they may know they have (Pillow 1999; Morris 2000; Moshman 2004). And it is evaluating one's reasons that is the hallmark of agency on Korsgaard's view.

The idea that normal adolescent humans are not autonomous agents flies in the face of the typical approach to developmental moral psychology—and common sense—according to which children have a very early entry into the domain of agency, even though the range of intentional actions is more limited than that of adult humans. By examining moral development starting with ten-year old boys, Kohlberg presumed that there was moral reasoning of some sort at this age, and that assumption mirrors the commonsense conception that children are moral agents, even though they cannot be held responsible for all their actions (Kohlberg 1981). That we recognize children as not *fully* responsible for their actions is reflected in their special legal status. Since children are still developing their cognitive capacities and their ability to control their impulses and emotions, children are limited in what they can do. Given the acceptance of the "ought implies can" principle, children enjoy this special status. But this doesn't mean that children are not agents, and that their behavior cannot be categorized as good or bad.

Korsgaard's requirement that agents have explicit knowledge of their reasons and are able to analyze those reasons also runs into problems when we consider adult human

cognition. Research on adult moral reasoning suggests that adults do not generally consider their reasons when making moral judgments (Haidt 2001). Korsgaard may respond that the requirement is only that an agent *can* consider her grounds for action, which is consistent with the findings that humans very often do not consider their reasons for their moral judgments. However, to take this position as a response to Haidt's findings would be to accept that humans are not living up to their moral obligations most of the time, and that most of our actions cannot be understood as autonomous.

If the standard is too high for many humans, it shouldn't be surprising that the standard is also too high for apes. Rather than taking this as an admission that apes aren't agents because they don't mindread, we can take it as evidence that the requirements for autonomy stated by Korsgaard are too high for the type of agency we are concerned with; we want to find an account of agency that can be fulfilled by very young children, since such children already have some understanding of social norms (which, as you may recall, is what we're really interested in here). Instead we should look at an account of agency that is inclusive of these young children.

Consider again Christman's account of autonomy as "to be autonomous is to be one's own person, to be directed by considerations, desires, conditions, and characteristics that are not simply imposed externally upon one, but are part of what can somehow be considered one's authentic self" (Christman 2009). We can appeal to this definition in order to ask about the cognitive capacities required, and whether children have them, and if so, whether apes do as well. Let's focus on two aspects of this definition in turn; first we'll look at being directed by internal considerations, and then we'll turn to the issue of being one's own person.

What does it mean to be directed by internal considerations rather than those that are externally imposed? Let me suggest a sufficient condition: the ability to distinguish intentional from unintentional action. An intentional action is done purposefully, and would often be described as being done for reasons. If someone can sort intentional actions from other kinds of actions, then there is at least an implicit recognition that these two kinds of actions are different, and that some actions are the responsibility of the agent, and others are not. If one can distinguish internal considerations from external ones in others, there is every reason to expect that one could do so for one's self as well.

There is evidence that apes have the cognitive capacities for identifying intentional behavior. For example, there is evidence that chimpanzees understand that others have mental states such as seeing, and that seeing motivates individuals to act (Hare et al. 2000; Hare et al. 2001; Plooj 1978; Goodall 1986). There is also evidence that chimpanzees understand goals and intentionality (Uller 2004; Tomasello & Carpenter 2005; Warneken & Tomasello 2006). For example, Claudia Uller found that chimpanzees, like human children (Gergely et al. 1995), seem to perceive the behavior of geometric shapes moving in the right way as intentional (Uller 2004). For both humans and chimpanzees, a violation of expectation paradigm was used to measure the subjects' responses. While Gergely concluded that the infants' surprise response to "irrational" behavior suggests that they attribute goals and rationality, Uller's conclusion was more circumspect, even though her infant chimpanzee subjects responded in the same way as the human infants. She concludes that chimpanzees, at least, have an understanding of agency.

This finding concerning infant chimpanzees is consistent with other experimental studies of intentionality attribution. Call and colleagues found that chimpanzees are more impatient with humans who are unwilling to give them food compared with humans who are unable to give them food; they beg more from the capable person who is unwilling than they beg from the person who is unable to access the visible food (Call et al. 2004). Warneken & Tomasello found that chimpanzees respond appropriately to the communicative gestures of human caregivers (Warneken & Tomasello 2006). While engaged in what appeared to be informal social interactions with the experimenter, the chimpanzees would be tested on their ability to respond to a nonverbal request for help. In one condition, the experimenter dropped an object and requested that a chimpanzee pick it up, which she readily did.

Apes' understanding of intentionality has also been investigated by looking at contingent responsivity. For example, a chimpanzee named Cassie responded differently when being imitated by his caregiver than he did when his caregiver engaged in non-imitative behavior (Nielsen et al. 2005). Like human infants, Cassie would systematically vary his behavior while closely watching the imitator. Nielsen and colleagues describe one bout of behavior while Cassie was being imitated: "Cassie poked his finger out of the cage, wiped the ground in front of him, picked up a piece of straw and placed it in his mouth, pressed his mouth to the cage, then poked his finger out of the cage again" (Nielsen et al. 2005, 34). Such repetitive sequences were the norm when Cassie was being imitated, but not when the caregiver engaged in non-imitative behavior or no behavior at all. Cassie's response demonstrates that he was aware that his caregiver was acting purposefully, further evidence that the chimpanzee has a notion of agency.

As well, research on natural pedagogy and ostensive communicative cues could offer additional information about apes' ability to recognize intentional agency in others. Csibra suggests that in humans, ostensive cues that lead infants to come to understand intentional communication are direct gaze, infant-directed speech, and contingent responsiveness or turn-taking (Csibra 2010). We know that direct gaze does occur in chimpanzee mother-infant dyads (Bard et al. 2005), and as reviewed above there is evidence that apes test contingencies in order to determine whether actions are intentional or not. Mother-infant ape research can investigate parallels of these ostensive cues in the development of ape communication.

Now, on to the second aspect of Christman's definition. What does it mean to be one's own person, and act from one's authentic self? One interpretation is that an authentic self is one that is self-created, rather than given to the agent fully formed. To create one's self requires the ability to deliberately change oneself. There are various ways in which one can act to change or control her behavior. One way of changing oneself is to work things out in the space of reasons. But other ways would be to develop habits of behavior and to self-modulate emotional responses.

As far as I know, the ability to self-create by purposefully changing oneself has not been given direct attention by great ape researchers. However, there are some findings that suggest great apes do act to improve themselves in various ways. For example, the social learning literature indicates that great ape species do learn from observing others' behavior (Whiten 2000, Tomasello et al. 1987, Call & Tomasello 1994). Orangutans will position themselves so that they are only a few inches away from the behavior that they are observing, and will subsequently attempt the behavior themselves

(Call & Tomasello 1994). Some scientists think that great apes practice behaviors in order to develop competences (Anne Russon, pers. communication). We have clear evidence that apes spend years engaged in complicated tasks like nut-cracking and cooperative hunting before they become proficient, and there is certainly valuable information about the role of practice in the development of such skills. More research on the question of practice in the learning research can help to determine whether and to what extent the great apes act to purposefully change themselves.

Two other areas of research that are ripe for exploring the question of great ape self-improvement:

Personality. The field of cross-species personality research has identified six personality factors in chimpanzees (King & Figueredo 1997) and five factors for orangutans (Weiss, King, & Perkins 2006). While the initial goal of this research was to determine whether there are personality differences in other species, and what the personality factors consist of, future work could be on changes in personality and the events and behaviors that drive personality changes. Given the research of Francys Subiaul and colleagues, we know that chimpanzees can learn some of the traits of unfamiliar humans by watching them observe the human interacting with another chimpanzee (Subiaul et al. 2008). The question is whether individuals can categorize themselves in the same way, and modify their behavior based on that knowledge. This sort of investigation may further our understanding of whether apes or other animals take steps toward something like self-improvement.

Teaching. Self-improvement is related to helping other improve, and any evidence of pedagogy in apes can offer evidence that the apes also act to self-improve.

Teaching has been operationally defined by Caro and Hauser (1992) as requiring the teacher to modify her behavior only in the presence of a learner, such that the teacher gains no immediate benefit from the behavior, and the learner acquires the skill being demonstrated. There is some evidence for teaching under Caro and Hauser's criteria for three species: the ant species *T. albipennis* (Franks & Richardson 2006), meerkats (Thornton & McAuliffe 2006) and pied babblers (Raihani & Ridley 2008). While there are occasional anecdotes about teaching in apes, these are often very controversial (e.g. Boesch 1991, 1993), and there have been no published systematic study of pedagogy in apes. This may be due to the difficulty of observing that an instance of teaching fulfills all three of Caro and Hauser's criteria. Another way of investigating teaching in apes would be to look more toward the mechanisms presumed to be at work, and look for evidence of such mechanisms. For example, one could follow Cisbra and Gergeley's recent suggestions about natural pedagogy (which they think is unique to humans) and look for the building blocks of teaching in attention monitoring, understanding of reference, and acquisition of general knowledge in ape species (2006, 2011)

But what about prediction?

One might worry that none of the capacities discussed above can be sufficient for being a moral agent, which requires agency that is socially directed. And, the objection might go, to be a social agent, one has to predict behavior and, one needs to mindread to be a good behavior predictor.

I hinted at my answer to this objection earlier. While I think it is true that on most theories in normative ethics a moral agent has to be able to predict behavior, I don't think

mindreading is necessary for predicting the majority of human behaviors—and in fact, when we do mindread we are much less likely to make accurate predictions. I have argued that some of the presuppositions about human cognition that have been made in the ape theory of mind research are been unwarranted (Andrews 2005, 2012). The assumption that humans attribute beliefs and desires in order to predict simple behaviors has had a huge influence on subsequent research, though it is by no means clear that humans do need to attribute beliefs and desires to predict behavior. I have argued that even in false belief cases and in deception cases, individuals can predict behavior using a number of different heuristics which social psychologists have shown are present in humans, including generalizations over past behavior, social roles, personality traits, generalization from self, and stereotypes. Given that predicting behavior is usually seen as being an important part of being a social agent, the ability to predict behavior without attributing belief allows us to set aside this objection to seeing apes as intentional agents.

Conclusion

Whether or not apes have an understanding of other's beliefs is an open question, but it is one that need not be answered before answering the question of ape autonomy, or the existence of social norms, pedagogy or cumulative culture in ape societies. We already know that apes are able to discriminate intentional from nonintentional agents, and there is evidence that apes may actively seek to self improve or to create themselves. Such striving may sound rather high and mighty, but it need not be. Choosing a mate, engaging in a dominance battle, increasing hunting territory (as described by Watts et al. 2006), and exposing one's offspring to the technologies and practices of the community

may all be seen as part of self-creation. When humans engage in such things, we often do think of them in rich or evocative terms such as *building a family*, *improving one's lot in life*, *seizing power*, *mothering*, and so forth. But the descriptions are less important than the acts themselves, and those we share with our other ape cousins. If we can come to see other apes as agents who engage in self-creation, we will be less likely to exclude them the moral and legal standing we grant human agents. This status doesn't require sophisticated cognitive capacities such as mindreading or language capacities.

I've suggested that a society in which mindreading might develop is a society that already has social norms. We need not worry about moral norms existing without mindreading, given an account of agency that consists of (a) recognizing intentional agency and (b) active self-improvement. However, evidence that apes mindread will also serve as evidence that they have moral norms, on the account I offer. Thus, not only the evidence reviewed above but also evidence that apes understand others' perceptual states, informational states, and goals would also serve to defend the claim that they are agents with social norms. Even understood as an ongoing research program, the current body of evidence should make us think more than twice about continuing practices that treats other apes as objects, rather than as subjects with rich individual and social lives. Using apes as actors, as subjects in medical tests, or otherwise as objects for human enjoyment does not respect their probable nature as agents with social norms. As scientists continue examining ape behavior, the teachers, judges, and builders of our society should seek to protect other apes from our overwhelming interest in them, by taking the default position that other apes are autonomous agents with their own projects that need to be respected. This suggests to me that we should grant other apes moral and legal standing, thereby

demonstrating what humans can do with our ability to consider our own reasons for action.

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