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WHEN WE NEED A HUMAN: MOTIVATIONAL DETERMINANTS OF ANTHROPOMORPHISM

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We propose that the tendency to anthropomorphize nonhuman agents is determined primarily by three factors (Epley, Waytz, & Cacioppo, 2007), two of which we test here: sociality motivation and effectance motivation. This theory makes unique predictions about dispositional, situational, cultural, and developmental variability in anthropomorphism, and we test two predictions about dispositional and situational influences stemming from both of these motivations. In particular, we test whether those who are dispositionally lonely (sociality motivation) are more likely to anthropomorphize well–known pets (Study 1), and whether those who have a stable need for control (effectance motivation) are more likely to anthropomorphize apparently unpredictable animals (Study 2). Both studies are consistent with our predictions. We suggest that this theory of anthropomorphism can help to explain when people are likely to attribute humanlike traits to nonhuman agents, and provides insight into the inverse process of dehumanization in which people fail to attribute human characteristics to other humans.

Aristotle suggested that the only critical ingredient in the recipe for supreme happiness was other people, and social psychologists more than 2,000 years younger have provided empirical justification for this claim (Diener & Seligman, 2002). People need other humans in daily life for reasons ranging from the practical to the exis-

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tential, and we suggest here that this need is so strong that people sometimes create humans out of non–humans through a process of anthropomorphism. In particular, we suggest that such inferential reproduction can be used to satisfy two basic needs that other humans (or the concept of humans) can satisfy in everyday life—the need for social connection (Baumeister & Leary, 1995) and the need to experience competence (i.e., control and understanding of the environment; White, 1959). We derive these claims from a more general theory of anthropomorphism (Epley, Waytz, & Cacioppo, 2007), and spend the remainder of this article testing two predictions derived from this theory and explaining why psychologists should care about anthropomorphism.

WHAT ANTHROPOMORPHISM IS (NOT)

Perceiving humanlike characteristics in either real or imagined nonhuman agents is the essence of anthropomorphism. These humanlike characteristics may include physical appearance (such as a religious agent believed to look humanlike; Guthrie, 1993), emotional states perceived to be uniquely human (e.g. Leyens et al., 2003), or inner mental states and motivations (Gray, Gray, & Wegner, 2007). Real or imagined nonhuman agents can be anything that acts—or is believed to act—with apparent independence, including nonhuman animals, natural forces, religious agents, technological gadgets, or mechanical devices. Such anthropomorphic representations are important determinants of how a person behaves towards these agents (as with nonhuman animals, for instance), or how a person may behave in light of these agents (such as with guidance that people seek from anthropomorphized religious agents).

Knowing what anthropomorphism includes requires only one minute spent alone with a dictionary (readers are encouraged to take that minute now). More important for psychologists, however, is what it does not include, and it does not include at least four things. First, anthropomorphism does not include behavioral descriptions of observable actions. Announcing that the snarling dog chewing on one's ankle is aggressive is a description of an observable action, and even the most ardent Skinnerian would accept that there is no anthropomorphism in that statement. Anthropomorphism requires going beyond what is directly observable to make inferences about unobservable humanlike characteristics (such as stating that the dog is vindictive; see also Semin & Fiedler, 1988).

Second, anthropomorphism does not merely entail animism. Piaget (1929) noted, for instance, that children tend to see living agents almost wherever they look. But animate life is not a uniquely human property. Although anthropomorphism entails treating an agent as living, the former is not reducible to the latter.

Third, anthropomorphism does not include any requirement of reasoned or reflective endorsement of an inference. Like any belief or attitude, the strength of anthropomorphic inferences will vary from one domain or context to another (variability that our theory is designed to predict). Religious believers frequently speak of God's will; cat owners describe their pets as conceited, and computer users verbally scold and curse their technology when it fails to "cooperate" with them (a practice reported by 79% and 73%, respectively, of PC users; Luczak, Roetting, & Schmidt, 2003). These examples describe behavior consistent with anthropomorphism, but not all people in these instances will, upon conscious reflection, report that the agent in question truly possesses humanlike characteristics. Strong forms of

anthropomorphism (such as many religious beliefs) entail behaving towards an agent as if it possessed humanlike traits along with conscious endorsement that the agent actually possesses those traits, whereas weak forms (such as cursing one's computer) may only contain the weaker as-if component. This variability in strength is the same kind of variability that occurs in the strength of any attitude (Petty & Krosnick, 1995). A theory of anthropomorphism does not need to accept one form or reject another, but it does need to explain both strong and weak forms equally well.

Finally, anthropomorphism is not necessarily inaccurate. Everyday discourse, scientific debates, and scholarly treatments of anthropomorphism have equated anthropomorphism with an overgeneralized erro*r* (e.g., Guthrie, 1993), and therefore hinge on whether anthropomorphism actually represents a mistaken representation of a nonhuman agent. But considering an inference anthropomorphic only when it is clearly a mistake is itself a mistake. Readers are encouraged to return to their dictionaries for another minute and note that accuracy appears nowhere in the definition of anthropomorphism. People conceive of gods, gadgets, and an entire gaggle of nonhuman animals in humanlike terms. Although interesting, whether such inferences are accurate is orthogonal to a psychological understanding of the conditions under which people are likely to make an anthropomorphic inference. A psychological theory of anthropomorphism should predict variability in the tendency to perceive humanlike traits in nonhuman agents, and can leave questions of accuracy for others to answer.

MOTIVATIONAL DETERMINANTS OF ANTHROPOMORPHISM

Due to the incessant focus on accuracy, much research on anthropomorphism has actually overlooked a psychological explanation for the very phenomena in its midst. Although anthropomorphism is arguably widespread (Guthrie, 1993; Hume, 1757/1956), even the most casual observer of the human condition will notice that it is far from invariant. Some people anthropomorphize more than others (Chin, Sims, DaPra, & Ballion, 2006), some situations induce anthropomorphism more than others (Epley, Akalis, Waytz, & Cacioppo, 2008), children tend to anthropomorphize more than adults (Carey, 1985), and some cultures are notorious for their anthropomorphic religions and worldviews (Asquith, 1986). We provide here a brief overview of a theory of anthropomorphism focusing on three critical determinants designed to predict variability across the four major categories of operational influence in daily life—dispositional, situational, developmental, and cultural (see Epley et al., 2007 for a more detailed description). We derive this theory largely from work in social cognition investigating how people think about other people.

Anthropomorphism represents just one of many examples of induction whereby people reason about an unknown stimulus based on a better–known representation of a related stimulus (Rips, 1975), in this case reasoning about a nonhuman agent based on representations of the self or humans. The basic operations underlying inductive inference are the acquisition of knowledge, the activation or elicitation of knowledge, and the application of activated knowledge at the time of judgment (Higgins, 1996). The application process includes attempts to correct, adjust, or integrate less accessible information into a more automatically activated default representation—a correction process that is often insufficient leaving final judgments

biased in the direction of the initially activated representation (for examples see Epley & Gilovich, 2006; Gilbert, 2002). Seeing humanlike attributes in nonhuman agents is therefore likely to be determined by the relative accessibility and applicability of anthropomorphic representations compared to nonanthropomorphic representations, and the likelihood of correcting an anthropomorphic representation once it is activated. How people perceive nonhuman agents therefore utilizes the same mechanisms involved when people think about other people (see also Kwan, Gosling, & John, 2008, this issue).

As part of a larger theory of anthropomorphism (Epley et al., 2007), we suggest that two motivational factors are important determinants of anthropomorphism, namely sociality and effectance motivation. Sociality motivation is the fundamental need for social connection with other humans. When lacking social connection with other humans, people may compensate by creating humans out of nonhuman agents through anthropomorphism—increasing belief in anthropomorphized religious agents (e.g., God), or perceiving nonhumans to be more humanlike (e.g., pets). Those who are momentarily or chronically lonely should thus anthropomorphize more than those who are connected. We test this hypothesis in Study 1.

Other humans not only provide a sense of social connection, but the richly detailed and readily accessible concept of "human" (or the self) can also serve as a useful source of explanatory power for understanding, controlling, and predicting another agent's behavior. The concept of human or one's own egocentric experience is therefore likely to serve as a useful knowledge structure when reasoning about nonhuman agents (in the same way that egocentrism is useful heuristic for reasoning about other people; Dawes & Mulford, 1996). Use of this heuristic, however, should be moderated by one's motivation to understand, control, and interact competently in one's environment. Such effectance motivation (White, 1959) is strengthened by variables that increase the incentives for competence, such as a desire for control or predictability, the possibility of future interactions, or strategic interactions. Anthropomorphism can satisfy effectance motivation by providing a sense of understanding and control of a nonhuman agent, and should therefore increase as effectance motivation increases. Those who are particularly fond of feeling in control of one's environment, for instance, should be especially likely to anthropomorphize in times of uncertainty. We test this hypothesis in Study 2.

These two motivational factors make unique predictions about how specific dispositional, situational, developmental, and cultural variables will influence anthropomorphism. We believe these motivations are among the primary determinants of anthropomorphism (and other important motivations may exist, see Norenzayan, Hanson, & Cady, 2008, this issue), and certainly do not expect all instances of motivated reasoning (e.g., motivated self–enhancement) to influence anthropomorphism. Our goal here is not to articulate all specific predictions (see Epley et al., 2007, for such articulation), but rather to test directly a subset of them—namely dispositional and situational predictions regarding sociality and effectance motivation. Our theory of anthropomorphism is derived from work in social cognition, and many of our predictions need to be tested directly. The experiments here provide two such tests.

STUDY 1—SOCIALITY MOTIVATION

Most readers will be well familiar with the stereotype of the introvert who becomes just a bit too enamored with her cat (those in the minority may visit www.crazycatladies.org). Being disconnected from other people is not only unpleasant and uncomfortable (Baumeister & Leary, 1995), but it is unhealthy as well (Cacioppo et al., 2002; House, Landis, & Umberson, 1988). Thankfully for one's well being, people are relatively clever in their ability to gain a sense of social connection even in the complete absence of actual human agents. Television characters, photographs, and religious figures all appear to be effective surrogates for actual human connection (Gardner, Pickett, & Knowles, 2005). Our hypotheses here, however, go beyond predicting that chronic social isolation or disconnection will increase attraction or liking for nonhuman agents, and predict that such a chronic need for social connection will alter the humanlike characteristics that people attribute to these agents. In particular, we suggest that when people are chronically isolated they make up humans by anthropomorphizing nonhuman agents—creating a sense of social support through a kind of inferential reproduction. We tested this hypothesis in Study 1 by asking people to evaluate familiar pets on anthropomorphic traits related to social connection, anthropomorphic traits unrelated to social connection, and non–anthropomorphic traits. We predicted that dispositional loneliness would increase the likelihood of anthropomorphizing one's pet on traits related to social connection.

METHOD

Participants

One hundred sixty–six Harvard University undergraduates completed this experiment in exchange for a chance to win $50. Participants were recruited via e–mail for a study investigating how people think about their pets and directed to an online website where they completed all of the following measures. All participants were current (or for 2% of cases, past) pet owners. The vast majority (96%) reported that they were not currently living with the pet under consideration.

Procedure

All participants completed the 20–item UCLA loneliness scale (Russell, 1996), consisting of items such as "I lack companionship," "There is no one I can turn to," and "I feel alone." One group of participants did so before, and the other group after, completing the pet–rating items. On the critical pet–rating items, participants were instructed to consider a series of 14 traits and asked to rank order them, from 1 being most descriptive of their pets to 14 being the least descriptive. These included three anthropomorphic traits related to providing social connection (thoughtful, considerate, and sympathetic), four anthropomorphic traits unrelated to providing social connection (embarrassable, creative, devious, and jealous), and seven non–anthropomorphic traits that were simply behavioral descriptions (aggressive, agile, active, energetic, fearful, lethargic, and muscular). We classified traits based on existing research that identifies metacognition as a critical distinguishing feature between traits seen as humanlike versus those shared by other living agents

(Demoulin et al., 2004; Haslam, Bain, Douge, Lee, & Bastian, 2005). When finished, participants were logged off of the website.

RESULTS

No effort was made to restrict variability in the pets participants considered, and this sample included 99 dogs (of roughly half as many breeds), 48 cats (also of reportedly different breeds), and 19 "others" (11 fish, 2 lizards, 2 parrots, 1 chicken, and 3 unspecified). Including pet type (dog, cat, "other") did not reduce the significance level of any of the following results, and is not discussed further.

To analyze these results, participants' responses to the loneliness scale were first reverse–scored where appropriate to obtain an overall measure of social disconnection. We next calculated the average rank given to the three anthropomorphic traits related to social connection ($\alpha = .73$), to the four anthropomorphic traits unrelated to social connection ($\alpha = .09$), and to the seven behavioral descriptors (after reverse coding "lethargic," $\alpha = .57$). The α levels of these last two measures are unacceptably low (due to being selected as unrelated or irrelevant to social connection), so we analyzed both the composite rankings (for conceptual reasons) as well as the individual rankings themselves in the following analyses.

As predicted, participants who felt more chronically disconnected provided higher rankings of the supportive anthropomorphic traits than participants who felt more socially connected, $r\ (164) = -.18$, $p = .02$. A similar correlation did not emerge on the nonsupportive anthropomorphic traits, $r\ (164) = .07$, $p = .37$, nor among the behavioral traits, $r\ (165) = .03$, $p = .70$. None of the individual items for either the nonsupportive anthropomorphic traits or the behavioral traits approached significance themselves after correcting for multiple comparisons (all ps $> .2$).

We interpret these results as consistent with our prediction that participants who were chronically lonely would create agents of social support by anthropomorphizing their pets. That these correlational patterns emerged among only the anthropomorphic items related to social connection suggests that participants may be creating agents to satisfy their need for social connection. Of course, such correlational results cannot attest to this causal connection, but we report similar results elsewhere in which manipulating a person's sense of social connection increases their tendency to again anthropomorphize their pets on traits related to social connection (Epley et al., 2008). This convergent validity suggests that anthropomorphism may serve a social connection function by creating humanlike agents out of nonhumans.

One interesting possibility not addressed by this experiment is that people who are chronically isolated or rejected from other people may *prefer* social connection through nonhuman agents, such as religious agents or pets. People who are ostracized by another person, for instance, tend to avoid or aggress toward that person (Buckley, Winkel, & Leary, 2004; Twenge & Campbell, 2003) and seek connection from *other* people (Maner, Dewall, Baumeister, & Schaller, 2007). A person who is chronically isolated or disconnected from people may withdraw from attempts to connect with other humans in general, and may instead seek connection with nonhuman agents through a process of anthropomorphism. Study 1 did not compare evaluations of the mental states or traits of other humans with nonhuman pets, and it is at least possible that experiments that do so may reveal an interesting asymmetry.

STUDY 2—EFFECTANCE MOTIVATION

People anthropomorphize to satisfy sociality needs, but turning a nonhuman agent into a human through a process of anthropomorphism can also fulfill a basic need for understanding, control, and predictability. Charles Darwin (1872/2002) argued, for instance, that anthropomorphism was essential to progress in understanding other animals. So too did Hebb (1946) who noted the utter lack of coherence that emerged when scientists studying with him at the Yerkes laboratory tried to avoid using anthropomorphic descriptions of nonhuman primates. "Whatever the anthropomorphic terminology may seem to imply about conscious states in chimpanzee," Hebb wrote, "it provides an intelligible and practical guide to behavior" (p. 48).

Humans are generally motivated to feel competent through resolving uncertainty, increasing predictability, and gaining a sense of control or efficacy over their environment (White, 1959). Anthropomorphism may satisfy this "effectance motivation" by providing a detailed knowledge structure that can be used to understand a novel nonhuman agent. To the extent that people use the concept of self or human to better understand a nonhuman agent, anthropomorphism should increase when effectance motivation is high, and decrease when effectance motivation is low. Incentives to understand an agent's behavior—such as being involved in strategic interaction with another agent (Berger & Douglas, 1981; Berscheid, Graziano, Monson, & Dermer, 1976), interacting with an apparently unpredictable agent (Barrett & Johnson, 2003), or having a high "need for control" (Burger & Cooper, 1979)—should increase effectance motivation and anthropomorphism, as well.

We investigated this prediction in Study 2 by asking participants to watch a short and mundane video clip of two dogs interacting with each other. One of these dogs appeared less predictable than the other (one was small, quick, and seemingly unpredictable, whereas the other was large, slow, and relatively predictable), and we expected this lack of predictability would induce more anthropomorphic inferences about the less predictable dog. In addition, we expected that those who were chronically high in effectance motivation—namely those high in Desire for Control (Burger & Cooper, 1979)—would tend to anthropomorphize more than those low in chronic effectance motivation. It is also theoretically possible that Desire for Control could interact with the predictability manipulation rather than just producing an independent main effect, and we did not have a clear *a priori* prediction about which particular pattern would emerge.

We conducted a pilot study to ensure that the two dogs shown on the video varied in their apparent predictability and controllability. Participants in this study (N = 54) watched the video two separate times, being instructed to pay attention to the smaller dog during the first viewing and the larger dog during the second viewing. When finished, participants rated how predictable each dog would be in a future interaction on a scale ranging from 1 (not at all predictable) to 7 (completely predictable), and how easy each dog would be to control on a scale ranging from 1 (easy) to 7 (difficult). As predicted, the smaller dog was rated as less predictable than the larger dog, Ms = 3.07 vs. 5.43, respectively, paired t (53) = 8.98, $p < .0001$, and also as more difficult to control, Ms = 4.57 vs. 3.54, respectively, paired t (53) = 3.13, $p < .004$.

PROCEDURE

Visitors to the Decision Research Lab at the University of Chicago ($N = 132$) participated in exchange for $5. Participants were told they would be taking part in a study on "attribution and interaction" and completed all parts of the study on MediaLab computer software. Participants first completed the 20–item Desirability of Control measure (Burger & Cooper, 1979) that asked participants to evaluate items such as, "I prefer a job where I have a lot of control over what I do and when I do it" on scales ranging from 1 (The statement does not apply to me at all) to 7 (The statement always applies to me). Responses from these twenty items (reverse scored where appropriate) were summed to calculate participants' desire for control score ($\alpha = .81$). The resulting distribution was platykurtic, so we conducted a median split on these totals in order to categorize participants as high in desire for control (high–DC, $n = 65$) or low in desire for control (low–DC, $n = 67$), and to easily submit these results to an ANOVA analysis.

Participants next viewed the video clip used in the pilot study. Participants watched this video twice following the same procedure as in the pilot study. When finished watching the video, approximately one–third of participants simply continued to the critical dependent measures, whereas the remaining participants were asked to imagine that, after the experiment, one of the dogs (approximately one-third told the large dog, and the remaining told the small dog) would be brought into the lab so that they could interact with the dog and attempt to teach it a trick. This variable did not influence the results in any meaningful way and is therefore not discussed further.

Participants were then asked to evaluate both dogs on three items related to anthropomorphism: the extent to which each dog was aware of its emotions, has a conscious will, and has a "personality," on scales ranging from 1 (not at all) to 7 (very much). Finally, participants were asked to rate the dog on its similarity to other life forms on a scale ranging from 1 (bacteria) to 11 (human).

RESULTS

The four anthropomorphism ratings were highly intercorrelated ($\alpha = .78$ and .80 for the small dog and large dog, respectively) and were therefore standardized and collapsed into a single composite for all of the following analyses.

A 2 (dog: unpredictable vs. predictable) × 2 (desire for control: high vs. low) ANOVA on the composite anthropomorphism measure revealed a predicted main effect for dog, such that participants rated the unpredictable dog ($M = .12$) higher on the composite than the predictable dog ($M = –.12$), $F(1, 130) = 11.50$, $p = .001$. A main effect of desire for control also emerged such that high–DC participants rated both dogs higher on the anthropomorphism composite ($M = .15$) than did low–DC participants ($M = –.14$), $F(1, 130) = 6.45$, $p = .01$. Interestingly, these main effects were qualified by a dog × desire for control interaction, $F(1, 130) = 3.84$, $p = .052$. The difference in evaluations of the predictable versus unpredictable dog was especially large among high–DC people, $F(1, 130) = 14.10$, $p < .0001$, and high–DC individuals anthropomorphized the unpredictable dog more than low–DC individuals, $F(1, 130) = 11.78$, $p = .001$ (see Figure 1). Neither of the other simple effects were significant (both ps > .3).

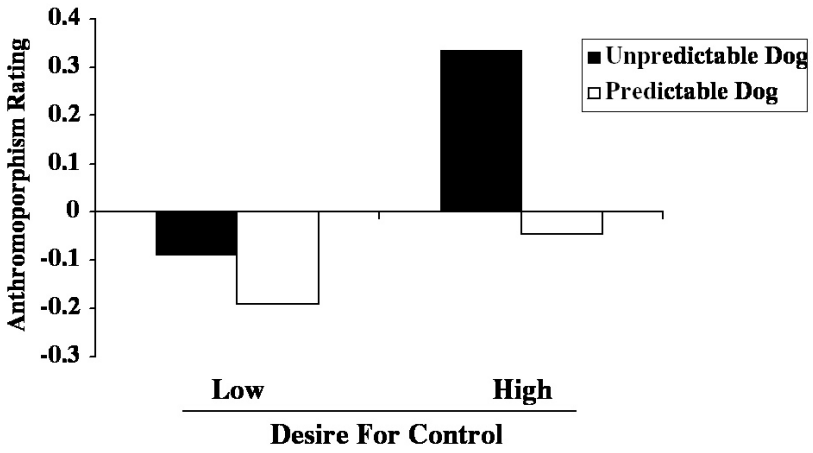

FIGURE 1. Anthropomorphism ratings for the predictable and unpredictable dog from participants high and low in Desire for Control (Study 2). Data are reported in *z*-scores. Larger numbers indicate greater anthropomorphism.

These results are consistent with our predictions about how effectance motivation may influence anthropomorphism, and provided a test of both dispositional and situational influences on anthropomorphism. An interaction emerged here between Desire for Control and the apparent predictability of the stimulus, suggesting that the dispositional tendency to seek understanding and control is facilitated by a stimulus that enables anthropomorphism. As with Study 1, of course, dispositional measures cannot isolate the cause of this effect, and experimental manipulations of effectance motivation are needed to clearly isolate its causal influence. We therefore find these results to be encouraging evidence of the role of effectance motivation as a determinant of anthropomorphism, and are currently conducting studies that experimentally manipulate effectance to provide convergent support for this notion (Waytz, Cacioppo, & Epley, 2008).

GENERAL DISCUSSION

Human beings have been thinking about nonhuman agents for every bit as long as they have been thinking about other humans, and yet scientific understanding of the latter vastly outstrips understanding of the former. This may appear perfectly acceptable. Whether people believe their pets are thoughtful, their PCs vindictive, or speak of their plants as "wanting" sunlight hardly seems the kind of intellectual puzzle that would spark a stampede of psychologists to search for explanations. Whether people recognize these humanlike traits in other *people*, however, is the stuff of love and war. A journal like *Social Cognition* should therefore be filled with experiments investigating people's thoughts about other people, and so it has been for every issue before this one.

But readers who share this assessment should think more carefully about why studying anthropomorphism is worth one's time before dismissing it completely, and we think it is well worth *our* time for at least four reasons. First, it's not clear that understanding how people think about relatively trivial agents such as pets or their computers is actually all that trivial. nonhuman agents, from dogs to gods, serve as a source of social connection, and the link between connection to these nonhuman agents and one's health and well–being is well documented (Serpell, 1991, 2003). Computer scientists charged with enabling computer users to learn from their products have begun utilizing anthropomorphism by creating interfaces that look and act humanlike. Such interfaces appear to facilitate learning compared to less humanlike interfaces (Moreale & Watt, 2004). And marketers utilize anthropomorphism to peddle products ranging from movies to motor parts (Aggarwal & McGill, 2007; Guthrie, 1993). Understanding how people think about even relatively mundane nonhuman agents can have wide–ranging—and potentially very important—implications (for some examples see Chartrand, Fitzsimmons, Fitzsimons, 2008, this issue, Gardner & Knowles, 2008, this issue, and Kiesler, Powers, Fussell, & Torrey, 2008, this issue).

Second, it is important to remember that the agents prone to anthropomorphism also includes religious agents that the vast majority of the world's population uses—or purports to use—as a moral compass. Thinking that one's dog is jealous is one thing, but thinking that one's god is jealous is quite another (see Morewedge & Clear, 2008, this issue). And yet the psychological processes that lead to these inferences should be identical in both cases. Indeed, we report elsewhere that experimentally induced feelings of loneliness not only increase anthropomorphism for one's pets (in an experiment similar to Study 1), but also increase belief in religious agents such as God and Angels as well (Epley et al., 2008). Xenophenes (6th century B.C.) was the first person to use the term *anthropomorphism*, and did so when noting the similarity in appearance between gods and their human followers. Understanding how this anthropomorphic process works with religious agents has advanced surprisingly little since that time. In a world long populated by explicit and powerful religious fundamentalism, such understanding seems long overdue.

Third, seeing a nonhuman agent as humanlike not only entails the attribution of humanlike characteristics, but it also carries the consequence of moral agency. Consciousness, intention, desire, and regret are all the very sorts of humanlike emotions that turn nonhuman agents into *moral* agents. It is no accident that environmentalists refer to "mother earth," for instance, and that appeals for animal rights often hinge on the reality of animal *suffering*. Anthropomorphizing at least some nonhuman agents creates an agent that deserves concern for its own well–being. Such agents are not just represented as humanlike, but are also more likely to be treated as humanlike.

Finally, understanding anthropomorphism should provide precious insight into the inverse process of dehumanization, whereby people *fail* to attribute humanlike characteristics to other humans and think of them as nonhuman agents (see Boccato, Capozza, Falvo, & Durante, 2008, this issue and Haslam, Kashima, Loughnan, Shi, & Suitner, 2008, this issue). The theory we have sketched here, and describe in greater detail *elsewhere* (Epley et al., 2007), can also be used to make predictions about when people will dehumanize other people and when they will not. For instance, feeling socially isolated increases the search for sources of social connection and increases anthropomorphism. Applied to dehumanization, feeling a

tight social connection to other humans should satisfy one's sociality motivation and therefore predict greater *dehumanization* among those who are highly connected. It is well–known that having a well–defined and highly connected ingroup facilitated dehumanization of an out–group (e.g., Leyens et al., 2003), and we have found in one recent experiment that those asked to think about of a close friend dehumanized outgroup members more than those asked to think about a distant acquaintance (Waytz, Epley, & Cacioppo, 2007). So too, we predict, should effectance motivation influence dehumanization. When incentives for understanding are reduced (no anticipated future interaction, highly predictable behavior, etc.), dehumanization should increase. Understanding anthropomorphism does more than increase understanding of how people think about nonhuman agents. It increases understanding of when people see humans in the environment and when they *do not*, both for better and for worse.

For these reasons we think an understanding of how people think about nonhuman agents in general, and an understanding of anthropomorphism in particular, is both long overdue and of central importance to psychologists interested in social cognition. We have outlined here two motivational determinants that can predict and explain when people are likely to attribute humanlike characteristics to nonhuman agents, and have provided two experiments that test predictions about motivational determinants of this anthropomorphic process. We believe that the long tradition of research in social cognition has already provided many of the pieces needed to solve this intellectual puzzle of anthropomorphism. What is needed now is some focused attention, systematic thought, and well–reasoned assembly.

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