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Social Cognition Unbound: Insights Into Anthropomorphism and Dehumanization

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Abstract
People conceive of wrathful gods, fickle computers, and selfish genes, attributing human characteristics to a variety of supernatural, technological, and biological agents. This tendency to anthropomorphize nonhuman agents figures prominently in domains ranging from religion to marketing to computer science. Perceiving an agent to be humanlike has important implications for whether the agent is capable of social influence, accountable for its actions, and worthy of moral care and consideration. Three primary factors—elicited agent knowledge, sociality motivation, and effectance motivation—appear to account for a significant amount of variability in anthropomorphism. Identifying these factors that lead people to see nonhuman agents as humanlike also sheds light on the inverse process of dehumanization, whereby people treat human agents as animals or objects. Understanding anthropomorphism can contribute to a more expansive view of social cognition that applies social psychological theory to a wide variety of both human and nonhuman agents.

Keywords
anthropomorphism, dehumanization, mind perception, social cognition, person perception

Ask your favorite demographer to tell you something about human population expansion over the course of history and they will probably show you a graph of exponential growth that appears likely—any moment now—to overwhelm the planet. Look around. People seem to be everywhere. But look harder and you will notice even more humanlike agents in the environment, from pets that can seem considerate and caring, to gods that have goals and plans for one's life, to computers than can seem to have minds of their own. People show an impressive capacity to create humanlike agents—a kind of inferential reproduction—out of those that are clearly nonhuman. People ask invisible gods for forgiveness, talk to their plants, kiss dice to persuade a profitable roll, name their cars, curse at unresponsive computers, outfit their dogs with unnecessary sweaters, and consider financial markets to be ''anxious'' at one moment and ''delirious'' the next. This process of anthropomorphism is a critical determinant of how people understand and treat nonhuman agents from gods to gadgets to the stock market, is central to multibillion dollar industries such as robotics and pet care, and features prominently in public debates ranging from the treatment of Mother Earth to abortion rights.

We suggest unbinding research on social cognition from its historic focus on how people understand other *people*. Studying how people understand other *agents*—whether human or not—dramatically broadens the scope of psychological theory and investigation to address when people attribute humanlike capacities to other agents and when they do not.

Why Anthropomorphism Matters

Anthropomorphism goes beyond providing purely behavioral or dispositional descriptions of observable actions (such as noting that a coyote is fast or aggressive); it involves attributing characteristics that people intuitively perceive to be uniquely human to nonhuman agents or events. Some people reported, for instance, seeing not only the face of the devil in the smoke from the 2001 terrorist attacks on the World Trade Center but the evil intentions and goals of the devil behind the attacks as well. Anthropomorphism therefore includes both physical features, such as perceiving a religious agent in a humanlike form, and mental capacities that people believe are uniquely human, such as the capacity to have conscious awareness, possess explicit intentions, or experience secondary emotions (e.g., joy, pride, shame, guilt). The inverse process of anthropomorphism

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is dehumanization, whereby people *fail* to attribute humanlike capacities to other humans and treat them like nonhuman animals or objects. The Khmer Rouge, for instance, described their victims as ''worms,'' Nazi propaganda depicted Jews as vermin, and Rwandan Hutus described the Tutsi as ''cockroaches.''

The Greek philosopher Xenophanes was the first to use the term *anthropomorphism* when describing the striking similarity between religious believers and their gods, with Greek gods having fair skin and blue eyes and African gods having dark skin and brown eyes. Psychologists 26 centuries later are only now beginning to study such anthropomorphisms seriously, illuminating phenomena ranging from religious belief to animal domestication to artificial intelligence as well as dehumanization. Neuroscience demonstrates that similar brain regions are involved when reasoning about the behavior of both human and nonhuman agents (Gazzola, Rizzolatti, Wicker, & Keysers, 2007), suggesting that anthropomorphism is guided by the same processes involved when thinking about other people. Cognitive and developmental psychology have examined both the pervasiveness and the limits of using the base concept ''human'' to reason about nonhuman stimuli such as biological kinds (Waxman & Medin, 2007) and religious agents (Barrett & Keil, 1996; Guthrie, 1993; Shtulman, 2008). And social psychology has examined the ways in which people are likely both to humanize nonhuman agents and to dehumanize out-group members or particular stereotyped groups.

This relatively recent surge of interest in anthropomorphism is driven by an appreciation of its wide-ranging implications and behavioral consequences. For instance, anthropomorphized agents become responsible for their own actions and therefore deserving of blame and praise, punishment and reward (Gray, Gray, & Wegner, 2007). When a bell in Mexico City's famous Cathedral, Catedral Metropolitana, struck and killed a bell ringer, for example, the congregation punished the bell, tying it down for 50 years. Agents that are capable of judgment, intention, and feeling are also capable of directing their judgment, intentions, and feelings toward *us*, and therefore become agents of social influence. Thinking about a judgmental God tends to increase prosocial behavior toward others (Norenzayan & Shariff, 2008), and questionnaires presented on computers with humanlike faces increase socially desirable responding (Sproull, Subramani, Kiesler, Walker, & Waters, 1996).

Perhaps the most important implication of anthropomorphism is that perceiving an agent to be human renders it worthy of moral care and consideration (Gray et al., 2007). Recent environmental legislation in Ecuador, Switzerland, and the state of Pennsylvania, for example, has granted legal rights to natural entities such as plants and rivers based on anthropomorphic inferences that these stimuli possess internal experience and can feel pain and pleasure. It is no accident, we assume, that environmental activists frequently speak of ''Mother Earth'' when trying to encourage more environmentally responsible behavior. Anthropomorphizing an agent not only leads people to represent it as humanlike but to treat it as humanlike as well.

Explaining Variability

Psychological research on anthropomorphism has developed slowly because it has long focused on the accuracy of anthropomorphic inferences. But whether a pet, a god, or a computer really possesses anthropomorphic traits is orthogonal to the psychological processes leading people to make such inferences in some circumstances and not in others. A psychological theory of anthropomorphism should instead explain and predict variability in this process. A recent theory we have developed identifies three primary determinants—one cognitive and two motivational—to explain important aspects of situational, developmental, cultural, and dispositional sources of variability in anthropomorphism (Epley, Waytz, & Cacioppo, 2007).

This theory recognizes anthropomorphism as a basic process of inductive inference. The primary cognitive determinant of anthropomorphism is therefore the extent to which knowledge of humans (or the self in particular) is elicited or activated. Anthropomorphism involves using existing knowledge about the self or the concept ''human'' to make an inference about a relatively unknown nonhuman agent, and factors that increase the accessibility and applicability of this knowledge therefore increase anthropomorphism. For instance, the more similar an agent is to a human in either its movements or its physical appearance, the more likely it is to be anthropomorphized (e.g., Morewedge, Preston, & Wegner, 2007).

Two motivational states can also increase the extent to which people either seek humanlike agency or use themselves or the concept ''human'' as an inductive base when reasoning about other agents. The first is the basic motivation for social connection. Lacking social connection with other humans may lead people to seek connections with other agents and, in so doing, create humanlike agents of social support. In one extreme case, a British woman named Emma, living a solitary existence and fearing rejection from other people, fell in love with a hi-fi system that she named Jake. Others have taken to ''marrying'' objects of anthropomorphized affection such as the Eiffel Tower or the Berlin Wall. In less extreme cases, those who are chronically lonely are more likely than those who are chronically connected to anthropomorphize technological gadgets, and experimentally inducing loneliness increases the tendency to anthropomorphize one's pet and to believe in commonly anthropomorphized religious agents (such as God or angels; Epley, Akalis, Waytz, & Cacioppo, 2008). It is perhaps unsurprising, then, that a considerable market has developed for robots that can create a sense of social connection, including uncanny androids that simulate a human hug and Paro, a personalized robotic seal that costs upwards of $4,700.

The second motivational factor that may increase anthropomorphism is effectance—the basic motivation to be a competent social agent. Lacking certainty, predictability, or control leads people to seek a sense of mastery and understanding over their environments. Given the overwhelming number of biological, technological, and supernatural agents that people encounter on a daily basis, one way to attain some understanding of

these often-incomprehensible agents is to use a very familiar concept (that of the self or other humans) to make these agents and events more comprehensible.

Increasing effectance motivation, either in incentivizing people to attain predictability or in experimentally increasing a sense of unpredictability, therefore also increases people's tendency to anthropomorphize robots, gadgets, and nonhuman animals (Waytz et al., 2009). This strategy seems to be somewhat effective—in one study, those instructed to provide anthropomorphic descriptions of various stimuli (e.g. a dog, a robot, an alarm clock, a set of shapes) reported that those stimuli seemed more predictable and understandable than did those who were instructed to provide nonanthropomorphic descriptions of the same stimuli (Waytz et al., 2009). Indeed, the World Meteorological Organization notes that the naming of hurricanes and storms—a practice that originated with the names of saints, sailors' girlfriends, and disliked political figures—simplifies and facilitates effective communication to enhance public preparedness, media reporting, and the efficient exchange of information.

Dehumanization: A Theoretical Inversion

Anthropomorphism is the process of representing nonhuman agents as humanlike, whereas dehumanization appears to be the inverse process. Dehumanization entails representing human agents as nonhuman objects or animals and hence denying them human-essential capacities such as thought and emotion. Inverting a theory of anthropomorphism may therefore provide insights into dehumanization. For instance, just as increased similarity to the self or humans increases the tendency to anthropomorphize a nonhuman agent, so too does decreased similarity increase the tendency to dehumanize other people. Consistent with this prediction, socially distant outgroups are frequently dehumanized, and those that are seen as the most dissimilar, such as drug addicts and homeless people, are also the most likely to be dehumanized (e.g., Harris & Fiske, 2006). Countless examples of interethnic dehumanization, from discrimination against Gypsies across Europe to enslavement of African Americans in early America, may stem in part from perceptions of the minority group as fundamentally dissimilar to the self or to one's own group.

Sociality appears to have a similarly inverse effect on anthropomorphism and dehumanization. Lonely people seek other humans just as hungry people seek food. A person who feels socially connected may therefore lack the motivation to actively seek out humanlike agents for social connection. If feeling isolated increases the tendency to anthropomorphize nonhuman agents, then feeling socially connected may likewise increase the tendency to dehumanize other people—that is, to *fail* to attribute basic features of personhood to other people. Consistent with this prediction, participants in one experiment who were experimentally induced to feel socially connected were more likely to deny humanlike mental states to others and to endorse dehumanizing violence (Waytz & Epley, 2009). Historical examples of dehumanization, such as ongoing violence between the Palestinians and Israelis, the Nazis' persecution of Jews during the Holocaust, and torture at Abu-Ghraib prison in Iraq, also suggest that perpetrators of dehumanization are often members of a socially cohesive in-group acting against an out-group. Social connection may have many benefits for a person's own health and well-being but may have unfortunate consequences for intergroup relations by enabling dehumanization.

Finally, effectance motivation should exhibit a similarly inverse relationship such that decreasing the need to interact effectively with others should increase dehumanization. One major factor that increases independence and decreases the need for effective interaction with other people is having power over others. One recent set of experiments demonstrated that being in a position of power increased the tendency to objectify subordinates, treating them as a means to one's own end rather than focusing on their essentially human qualities (Gruenfeld, Inesi, Magee, & Galinsky, 2008). Gender differences in power also contribute to female objectification in domains ranging from pornography (that emphasizes women's physical, not mental, attributes) to the practice of dowry exchange (that determines a bride's "worth" in property terms) in particularly patriarchal societies.

Together, these findings suggest a potentially shared process of humanization that operates regardless of whether the target of judgment is a human or nonhuman agent. Recognizing this continuity across targets may help to bring together research literatures that have historically been studied in isolation.

Moral Consequences

Humanness is not a binary quality but a continuum. For many agents, their placement on this continuum is both ambiguous and critical for determining their moral standing. For example, in some states in America, controversial legislation requires that a woman view the ultrasound image of her fetus before being able to have an abortion. This law has provoked criticism that the mere presentation of this image humanizes the fetus, consequently biasing women against an abortion (Sanger, 2008). By similar logic, a recent study showed that subtle humanization of medical patients appears to improve care for these patients. Radiologists evaluating X-rays reported more details to patients and expressed more empathy when a photo of the patient's face accompanied the X-rays (Turner & Hadas-Halpern, 2008). One doctor praised the study's importance because advances in technology have dehumanized the patient and this simple addition of a photograph appears to counteract that dehumanization.

Whereas humanizing an agent increases that agent's moral worth, dehumanizing others licenses wrongdoing toward them. Research has demonstrated that dehumanization facilitates aggression, endorsement of violence toward an out-group, and justification for past wrongdoing (see Haslam, 2006, for review). Recently, an effort to revitalize New Delhi, India, by bulldozing its slums left countless people homeless, inspiring one victim to say, "It's like we were picked up and thrown

away'' (Sidner, 2009). Dehumanization has no doubt contributed to numerous acts of violence and aggression throughout history as well as to more mundane everyday wrongdoings, such as making a sexist remark or ignoring a homeless person on the sidewalk. The consequences of being perceived as nonhuman are serious, and the same rights conferred to animals, plants, or rivers through anthropomorphism can be denied to people.

Conclusion

In the 2008 California state election, citizens voted to pass Proposition 2, which required farm animals to be kept in less restricting confines, and also Proposition 8, which denied to homosexual couples marriage privileges that had already been granted within the state. This vote to simultaneously treat farm animals more humanely but homosexual couples less humanely is an example of the ways in which both anthropomorphism and dehumanization may affect everyday life in both practical and important ways. Proponents of Proposition 8 invoked the humanlike ''will of God'' as a justification for denying marriage rights to homosexuals, even suggesting that allowing homosexuals to marry might open the door for humans to marry robots. Opponents of Proposition 8 noted that banning homosexual marriage was as absurd as prohibiting interracial marriage (still illegal until 1967 in some states), itself a clear example of the long history of dehumanization toward non-Whites.

The emerging research on anthropomorphism and dehumanization provides a theoretical account of these underlying processes, addresses the basic ways in which people are likely to represent others in terms of basic human capacities and rights, and documents the important consequences that result from this representation. Few social perceivers have difficulty identifying other humans in a biological sense, but it is much more complicated to identify them in a psychological sense.

Recommended Reading

Epley, N., Waytz, A., & Cacioppo, J.T. (2007). (See References). An article describing the most recent psychological theory of anthropomorphism's primary determinants.

Goff, P.A., Eberhardt, J.L., Williams, M., & Jackson, M.C. (2008). Not yet human: Implicit knowledge, historical dehumanization, and contemporary consequences. *Journal of Personality and Social Psychology*, *94*, 292–306. A paper providing a clear example of dehumanization in an interracial context that uses both archival and empirical data.

Guthrie, S. (1993). (See References). A comprehensive review of anthropomorphism-related phenomena that uses anthropomorphism to explain religion.

Haslam, N. (2006). (See References). The most recent psychological treatment of dehumanization, identifying two essential modes of dehumanization.

Kwan, V.S.Y., & Fiske, S.T. (2008). Missing links in social cognition: The continuum from nonhuman agents to dehumanized humans. *Social Cognition*, *26*, 125–128. An overview to a special issue of the journal, *Social Cognition*, devoted to anthropomorphism and dehumanization.

Declaration of Conflicting Interests

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References

Barrett, J.L., & Keil, F.C. (1996). Conceptualizing a non-natural entity: Anthropomorphism in God concepts. *Cognitive Psychology*, *31*, 219–247.

Epley, N., Akalis, S., Waytz, A., & Cacioppo, J.T. (2008). Creating social connection through inferential reproduction: Loneliness and perceived agency in gadgets, gods, and greyhounds. *Psychological Science*, *19*, 114–120.

Epley, N., Waytz, A., & Cacioppo, J.T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, *114*, 864–886.

Gazzola, V., Rizzolatti, G., Wicker, B., & Keysers, C. (2007). The anthropomorphic brain: The mirror neuron system responds to human and robotic actions. *NeuroImage*, *35*, 1674–1684.

Gray, H.M., Gray, K., & Wegner, D.M. (2007). Dimensions of mind perception. *Science*, *315*, 619.

Gruenfeld, D.H., Inesi, E.M., Magee, J.C., & Galinsky, A.D. (2008). Power and the objectification of social targets. *Journal of Personality and Social Psychology*, *95*, 111–127.

Guthrie, S. (1993). *Faces in the clouds*. Oxford, UK: Oxford University Press.

Harris, L.T., & Fiske, S.T. (2006). Dehumanizing the lowest of the low: Neuroimaging responses to extreme out-groups. *Psychological Science*, *17*, 847–853.

Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review*, *10*, 252–264.

Morewedge, C.K., Preston, J., & Wegner, D.M. (2007). Timescale bias in the attribution of mind. *Journal of Personality and Social Psychology*, *93*, 1–11.

Norenzayan, A., & Shariff, A.F. (2008). The origin and evolution of religious prosociality. *Science*, *322*, 58–62.

Sanger, C. (2008). Seeing and believing: Mandatory ultrasound and the path to a protected choice. *UCLA Law Review*, *56*, 351–408.

Shtulman, A. (2008). Variation in the anthropomorphization of supernatural beings and its implications for cognitive theories of religion. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *34*, 1123–1138.

Sidner, S. (2009, January 14). India razes slums, leaves poor homeless [electronic version]. Retrieved May 9, 2009, from http://www.cnn.com/2009/WORLD/asiapcf/01/14/india.slums/index.html

Sproull, L., Subramani, M., Kiesler, S., Walker, J., & Waters, K. (1996). When the interface is a face. *Human-Computer Interaction*, *11*, 97–124.

Turner, Y., & Hadas-Halpern, I. (2008, December 3). The effects of including a patient's photograph to the radiographic examination. *Paper presented at Radiological Society of North America*, Chicago, IL.

Waxman, S.R., & Medin, D.L. (2007). Experience and cultural models matter: Placing firm limits on anthropocentrism. *Human Development*, *50*, 23–30.

Waytz, A., & Epley, N. (2009). *Social connection enables dehumanization*. Unpublished manuscript, University of Chicago, Chicago, IL.

Waytz, A., Morewedge, C.K., Epley, N., Monteleone, G., Gao, J-H., & Cacioppo, J.T. (2009). *Making sense by making sentient: Unpredictability increases anthropomorphism*. Manuscript submitted for publication.