# Motivated Mind Perception: Treating Pets as People and People as Animals

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**Abstract** Human beings have a sophisticated ability to reason about the minds of others, often referred to as using one's theory of mind or *mentalizing*. Just like any other cognitive ability, people engage in reasoning about other minds when it seems useful for achieving particular goals, but this ability remains disengaged otherwise. We suggest that understanding the factors that engage our ability to reason about the minds of others helps to explain anthropomorphism: cases in which people attribute minds to a wide range of nonhuman agents, including animals, mechanical and technological objects, and supernatural entities such as God. We suggest that engagement is guided by two basic motivations: (1) the motivation to explain and predict others' actions, and (2) the motivation to connect socially with others. When present, these motivational forces can lead people to attribute minds to almost any agent. When absent, the likelihood of attributing a mind to others, even other human beings, decreases. We suggest that understanding the factors that engage our theory of mind can help to explain the inverse process of dehumanization, and also why people might be indifferent to other people even when connecting to them would improve their momentary wellbeing.

Everyone needs someone to cling to, a source of support to ease anxiety when feeling upended and alone. For Julia Hill during such times, that source was Luna (Hill 2000). "Whenever I felt [anxious] during those first days, I'd just hug Luna, and I'd feel rooted." For a little over 2 years, Julia spent every waking and sleeping moment with Luna, caring for her, defending her, encouraging her, and fighting

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to save her life. Julia slept, ate, and bathed with Luna. She danced, prayed, and talked intimately with Luna. She risked her life repeatedly to save Luna. This deep connection enabled empathy between them. “If anything happened to her, I’d feel like it would be happening to me.” When Luna was cut, “I felt it cut through me as well.”

Unlike most people’s source of support, however, Luna is not a person. “She” is a 200-ft tall redwood tree living in the ancient coastal forests of California. For 738 straight days Julia Hill lived 180 ft off the ground in the tree’s enormous branches, through constant wind and occasionally life-threatening storms, trying to save Luna from loggers. For Julia, Luna was not only a living being, but a mindful being as well. After living in the tree for some time, for instance, Julia stopped wearing shoes. “I couldn’t stand the feeling of separation from the tree. With all that stuff between my foot and the branches, I couldn’t tell if what I was about to stand on was strong enough to hold me or if my foot was on the branch securely. I couldn’t feel Luna’s life force or take instruction from her about how to climb.” Julia wrote that when each neighboring tree was cut around her, “it makes this horrible scream before crashing into those trees near it.” She claimed to feel their pain. “Each time a chain saw cut through those trees, I felt it cut through me as well. It was like watching my family being killed. I wanted to stop the violence, I wanted to stop the pain, I wanted to stop the suffering.” When asked by a reporter if she had a boyfriend, Julia responded only half-jokingly, “Who needs a boyfriend? I have a tree.”

Julia anthropomorphized Luna, attributing a humanlike mind to a clearly nonhuman entity. She is not delusional, or a paranoid schizophrenic who attributes minds to everything. She is more deeply committed to a cause than most people will ever be, but she is not psychopathological. Instead, she possesses a perfectly functioning human mind equipped with exceptional social senses that enable her to reason about the minds of others. Typically, these senses are directed at other human beings, monitoring another person’s intentions or goals or emotions, assessing another person’s preferences, and remembering what others know and believe (Herrmann et al. 2007). This capacity to reason about the minds of others appears to be one of the human brain’s greatest strengths, enabling just the kind of social intelligence necessary to live successfully in enormous social groups (Humphrey 1976; Tomasello et al. 2005).

Under the right circumstances, however, this capacity also enables a person to attribute a humanlike mind to almost any entity, thereby anthropomorphizing it. Such anthropomorphism matters for social life for three major reasons (Epley and Waytz 2010; Waytz et al. 2010b). First, mindful agents come to be seen as moral agents worthy of empathic care and concern, deserving treatment that respects their capacity to suffer, to reason, and to have conscious experience (Gray et al. 2007). Mindless agents are objects that can be used as tools. Anthropomorphism may therefore be the foundation of animal ethics (Wantanabe 2007). Second, mindful agents can reason and think and therefore be held accountable for their actions. A “guilty mind”—one with the capacity for intent and foresight—is required to convict a person of any crime in most modern courts of law. In times

when people were more willing to attribute minds to their domesticated animals, it was routine to arrest animals accused of a crime and try them in a criminal court (Humphrey 2002). Anthropomorphized Gods are still frequently held responsible for everything from major weather events to minor successes and (especially) misfortunes (Gray and Wegner 2010). Third, mindful agents become sources of social surveillance, capable of thinking, and forming impressions of *us*. In one experiment, for instance, participants respond to surveys in a more socially desirable manner when taking them on anthropomorphized computers (Sproull et al. 1996). In others, participants behaved more ethically when reminded of a mindful God who could be watching them (Norenzayan and Shariff 2008).

In this chapter, we will explain some of the psychological processes that guide anthropomorphism, whether it is a tree or a pet or a computer or a God. We believe that these processes are guided by the same motivational forces that create engagement with the mind of another person, forces that make the mind of another agent relevant for one's current goals. Motivation guides attention, and we believe two motivations in particular make people attend to the minds of other agents: the motivation to explain another agent's behavior and the motivation to form a social connection with another agent. We also believe these motivational processes of engagement can help to explain the inverse process of dehumanization, whereby people fail to attribute a mind to another human being. Understanding the motivational triggers that lead people to think about the minds of others helps to explain when people are likely to represent others as human beings, and when people are likely to represent others as animals or objects. The same human being who could attribute a mind to a tree in one moment could also overlook the mind of another human being in the next moment.

## Human Minds Everywhere?

Julia Hill's experience with Luna is extreme, but her ability to perceive a human-like mind in a nonhuman agent is not. The vast majority of people living on the planet today believe in one or more Gods who have thoughts and intentions and a wide range of mental capacities, from rage to love to omniscience. In one survey, 79% of computer owners reported having scolded their computer when it broke down, as if their mindless silicone chips could hear them (Luczak et al. 2003). It is not surprising, then, that General Motors (GM) became embroiled in controversy after airing a Super Bowl ad in which a robot, apparently failing to work up to GM's quality standards, became depressed and then rolled itself off of a bridge. The American Foundation for Suicide Prevention was outraged. The ad, they argued, "portrays suicide as a viable option when someone fails or loses their job," even though the main actor was a mindless machine (Waytz et al. 2010a). GM, in turn, now has more avenues available to defend itself given the U.S. Supreme Court's decision that corporations should be considered "persons" under the law, having attitudes and opinions and preferences that must be protected under the

right to free speech (Citizens United vs. Federal Election Commission 2010). Even inanimate objects can become endowed with minds. When a bell in Mexico City's famous *Catedral Metropolitana* struck and killed a bell ringer in 1947, the parishioners sentenced it to be tied down for 50 years and stripped of its clapper as punishment (Waytz et al. 2010b). Humanlike minds seem to appear almost everywhere, from pets that seem loving and thoughtful to financial markets described as "anxious" one moment and "optimistic" the next to a universe that can occasionally appear to have a plan and purpose for one's life. Julia Hill is far from alone.

Being able to attribute a humanlike mind to others is a fundamental feature of human cognition. When this ability is applied to a nonhuman agent, whether it is a tree or a computer or a company, it creates what most people refer to as anthropomorphism. By definition, anthropomorphism is the "attribution of human characteristics to a God, animal, or object." If you ask philosophers (Dennett 1987; Locke 1997), lawyers (Universal Declaration of Human Rights 1948), or a randomly selected human being to define what "human characteristics" entail, they will tend to describe two basic capacities involving a mind. One is the ability to think—to reason, to choose, to deliberate, to strategize, to act on preferences. The other is the ability to feel—to suffer, to have inner conscious experiences like joy or shame or pride or guilt (Farah and Heberlein 2007; Gray et al. 2007; Haslam et al. 2013; Leyens et al. 2000; Waytz et al. 2010c). Anthropomorphizing an agent goes beyond outward appearances by attributing a thinking or feeling mind to it. This definition makes it clear that anthropomorphizing a nonhuman is not necessarily inaccurate (a dog, after all, may well have a very humanlike mind), even though the most obvious cases of anthropomorphism entail attributing a mind to something—even momentarily—that is unambiguously mindless.

Because anthropomorphism is observed so commonly, philosophers, sociologists, and psychologists have suggested that it is an automatic and possibly even universal phenomenon. Xenophanes, a sixth century B.C. Greek philosopher, noted how readily religious believers anthropomorphized their Gods, with Greek Gods having fair skin and light hair but African Gods having dark hair and dark skin, even joking, that if cows had Gods then they would imagine them to be cow-like. Xenophanes' main concern, however, was not imagining Gods in humanlike forms, but rather imagining Gods with humanlike minds that are prone to immorality. "Homer and Hesiod have attributed to the Gods all sorts of things which are matters of reproach and ensure among men: theft, adultery, and mutual deceit" (Lesher 1992, p. 23). Hume (1957) agreed, and then went even further: "There is a universal tendency among mankind to conceive all beings like themselves." Piaget (1929) believed anthropomorphism began almost immediately in a person's life: "From the very beginning of its development…the child endows things with human activity." This is still a popular belief among social scientists today. "Inevitably and automatically, we all anthropomorphize," writes anthropologist Stewart Guthrie (1993). Far from being extreme or unusual, anthropomorphism appears to be as common to human nature as breathing and bipedalism.

As popular as this conclusion may be among philosophers and psychologists and the parents overrun with their toddler's stuffed animal friends, we also

believe it is overstated. In particular, we believe this general conclusion overlooks the basic psychological processes that enable people to think about the mind of another agent, thereby missing critical moderators of this tendency in everyday life and exaggerating its frequency. Indeed, most research on anthropomorphism has investigated either its accuracy ("What are dogs *really* thinking?"; e.g., Horowitz 2009) or its consequences ("Does anthropomorphism explain religious belief?"; e.g., Bering 2006). A moment's reflection will make it clear that some people (and some cultures) anthropomorphize more than others (Medin and Atran 2004), some situations induce anthropomorphism more readily than others (Epley et al. 2008a, b; Waytz et al. 2010d), and some objects or animals are anthropomorphized easily, whereas others are not (Waytz et al., 2010c). Even thinking about the mind of another person is not necessarily an automatic or spontaneous process (Apperly et al. 2006). Tufts University, for instance, was apparently having such a problem with students failing to think automatically about the minds of others that they had to establish a policy banning students from having sex in their dorm rooms *while their roommate is present.* It is apparently easy to overlook the minds of others when your own mind is focused elsewhere. Considering the mind of another person requires at least some motivation and attentional resources. Lacking either the interest or ability to consider another person's mind produces a long list of self-centered biases in judgment (Barr and Keysar 2004; Epley 2008; Gilovich et al. 1999; Nickerson 1999).

Also notice that as easy as it is to find cases of rampant anthropomorphism, so too is it easy to find cases where people fail to recognize another human mind standing right before their eyes. On May 2, 1789, Standing Bear, a Native American from the Ponca Tribe of Nebraska, was standing right in front of a U.S. Appellate court judge trying to convince the U.S. Government to recognize him as a person, as a mindful human. Up to this point in history, the government had treated Native American as property—as thoughtless objects or unfeeling savages. Turning to the audience during his testimony, this illiterate and formally uneducated man held out his hand and channeled Shakespeare. "This hand is not the color of yours. But if I pierce it, I shall feel pain. If you pierce your hand, you also feel pain. The blood that will flow from mine will be the same color as yours. I am a man." (Dando-Collins 2004). This is neither an historical anomaly nor an unrepresentative anecdote. Outgroup members are consistently and reliably seen as having diminished mental capacities compared to ingroup members, particularly being less able to feel pain or to suffer (Goff et al. 2008; Xu et al. 2009) and less likely to experience secondary emotions such as shame, pride, guilt, or embarrassment (Demoulin et al. 2004; Gaunt et al. 2002; Leyens et al. 2000).

It is not just the enemy or the disadvantaged, however, who occasionally get treated as mindless. Aaron Rodgers, quarterback of the National Football League's Green Bay Packers, defended a teammate who lashed out at an abusive fan by noting that "fans sometimes forget we're human…we are people, and we have feelings." Ray Lewis, one of the most vicious players in the NFL, expressed the same sentiment about NFL owners after they proposed extending the already grueling 16-game season to 18 games. "[I know] the things that you have to go through

just to keep your body [functioning]. We're not automobiles. We're not machines. We're humans" (Feith 2011). Even those charged with treating people the most humanely, namely doctors, can fail to recognize the full capacity of another person's mind right before their eyes. Up until the early 1990s, it was routine practice for infants to be operated on in the United States without anesthesia to dull their pain. Doctors at that time believed infants were less able to feel pain than adults, thereby making anesthesia unnecessarily risky. "How often we used to be reassured by more senior physicians that newborn infants cannot feel pain," Dr. Mary Ellen Avery (1993) writes in the opening of *Pain in Neonates*. "Oh yes, they cry when restrained and during procedures, but 'that is different.'" If the tendency to attribute a mind to others is so automatic and inevitable, then why do people sometimes fail to attribute a mind to other people?

We believe that both bottom-up perceptual processes as well as top–down motivational processes cause people to anthropomorphize nonhuman agents. Elsewhere we have described how perceiving similarity in motion and morphology can make an agent that looks humanlike on the outside also be evaluated as more humanlike on the inside (Epley et al. 2007; see also Harrison and Hall, 2010). Objects with humanlike faces, for instance, are more readily anthropomorphized than those without such faces (Johnson 2003), and animals that move at a humanlike speed are judged to have more humanlike mental capacities than those who move much faster (e.g., a hummingbird) or much slower (e.g., a sloth) than humans (Morewedge et al. 2007). These perceptual mechanisms, however, require that people are already attending to the agent in question, making even these perceptual processes open to influence by the motivational forces that guide attention. These perceptual mechanisms also cannot explain the wider variety of cases where minds emerge apart from bodies or any other humanlike perceptual cues. It cannot explain why people might attribute minds to volatile financial markets or to weather events or to the design of a randomly evolving universe. It cannot explain why the vast majority of people find it so easy to imagine the mind of a God, or Gods, pulling nature's strings. It cannot explain why people occasionally curse their computers or cars, or why Julia Hill empathized with Luna's pain. Instead, these questions require understanding what motivates people to engage with the mind of another agent. In this chapter, we will describe recent research identifying important motivational moderators of anthropomorphism, show how these moderators may also help to explain the inverse processes of dehumanization, and highlight what we think are important consequences of this research for everyday life.

## Anthropomorphism as Explanation

Fermilabs, located in suburban Chicago, owns a massive particle accelerator called the Tevatron. Before being decommissioned in 2011, it worked 24 hours per day, 7 days per week, for nearly 30 years. A team of engineers and physicists directed

the Tevatron, people who knew every inch and mechanical detail of the enormous machine. Todd Johnson, director of the Tevatron, noted that those who work on it "tend not to see the Tevatron as cold machinery. It has moods and character. They call it the Tev" (Spitzer 2011). Interestingly, Johnson did not suggest that the Tev always seems like it has moods and character, but that it does so only some of the time. "Everything goes like clockwork," he reported, "and all of a sudden you get a failure, and something else breaks, and then something else breaks, and it's hard not to apply anthropomorphic personality traits to the machine. You hear people say, 'Well, it's not really happy with us today.'" Why is it "hard not to apply anthropomorphic personality traits" only when the machine breaks? This description of the Tev does not sound like the automatic anthropomorphism suggested by Hume and Guthrie. Instead, it is only when the Tev breaks, when it does not work as it is supposed to, that the Tev gives a glimmer of mind. Mark Giorno, vice president of a company that builds robots for war, reports something similar. "You start to associate personalities with each of them. Their personality comes from, say, the steering being a little loose" (Singer 2009). Why does their personality not come from the steering working exactly as it was designed to work?

The reason, we believe, is because a mind is a set of concepts that provides an intivitive explanation of any independent action. When a robot moves exactly as it was programmed to move, completely predictably and expectedly, then nothing needs to be explained. The mindless robot moved as it was programmed to move—what Heider (1958) referred to as "impersonal causality." But when a robot starts to move in ways it was not programmed to move, seemingly on its own, then impersonal forces operating outside the agent are insufficient to explain behavior. Instead, something *inside* the agent seems necessary. Maybe moods, maybe personality, maybe a mind? As Heider explained (1958, p. 100), reasoning about an agent in terms of its mental states "ties together the cause-effect relations," allowing a person to provide an intuitive explanation for almost anything, from persons to toasters to Tevatrons. "What [anthropomorphic metaphors] all have in common," write Lakoff and Johnson (1980, p. 34), "is that they are extensions of ontological metaphors and that they allow us to make sense of phenomena in the world in human terms—terms that we can understand on the basis of our own motivations, goals, actions, and characteristics." This suggests that anthropomorphism should increase when people are motivated to explain another agent's behavior. A nonhuman agent may therefore be seen as mindless when lacking this motivation.

It is important to note that this basic motivation to explain and understand another's behavior has historically been taken for granted by psychologists studying social cognition. Indeed, Kelley (1967, p. 193) struggles to explain why his classic chapter on attribution theory was appropriate for the *Nebraska Symposium on Motivation*. The answer is existing research in social cognition implicitly assumes that person perceivers are motivated already to explain and understand another agent's behavior. At a baseline level, person perceivers are assumed to have what White (1959) referred to as effectance motivation—the motivation to be effective and competent social agents. "[Attribution] theory," Kelley explains,

describes processes that operate *as if* the individual were motivated to attain a cognitive mastery of the causal structure of the environment. Indeed, Heider explicitly assumes that "we try to make sense out of the manifold of proximal stimuli… This broad motivational assumption makes little difference in the development and application of the theory." We argue that this broad motivational assumption makes a significant difference, however, for whether or not people engage with the mind of another in the first place.

Consider your car. When your car starts up on a cold morning exactly as it is supposed to, then it is just cold steel. You are unlikely to pause for even a second to think about its inner workings. But when it fails to start, then drivers may find themselves cajoling and caressing and encouraging their "baby" to "wake up". In a survey of nearly 900 car owners, Morewedge (2006) asked car owners to report the extent to which their car seemed to have a mind, including beliefs, desires, and a personality. He also asked about their car's reliability—how often it needed unscheduled service, and how much it malfunctioned for unknown reasons. Consistent with these examples, he found a significant correlation between mind perception and malfunctioning. The less reliable people found their car to be, the more they reported that it seemed to have a mind. In a similar survey (Waytz et al. 2010a, b, c, d), two different samples of university undergraduates were asked how often they had problems with their computer. One sample was also asked how often their computer seemed to have "a mind of its own", whereas the other sample was asked the extent to which their "computer behaved as if it has its own beliefs and desires." In both samples, there was a significant correlation between malfunctioning and mind perception. The more often students reported having problems with their computer, the more it seemed to have a mind of its own or to have beliefs and desires.

So far, all of the examples in this section simply show that unexpected or unpredictable behavior is correlated with anthropomorphism. They do not show that unpredictable behavior *causes* anthropomorphism. These examples also tend to confound unpredictable behavior with negative behavior. You may curse your computer or cajole your car when it fails to start, or think that the Tev is not happy when it fails to operate as expected, not because the behavior is unexpected but rather because it is negative. Unexpected events are often negative events in everyday life, but these experiences can be disentangled experimentally.

In one experiment designed to do just that (Waytz et al. 2010d), participants visiting the Museum of Science and Industry in Chicago asked 10 yes or no questions to a robot named Asimo through a computer interface. Participants were allowed to ask any questions they wanted. Example questions could range from "does $9 \times 4 = 36$?", to "does my husband love me?", to "will the Cubs ever win the World Series?" Depending on experimental condition, Asimo responded either predictably or unpredictably. In the predictable-yes condition, Asimo responded "yes" to eight of the questions and "no" to two of the questions. In the predictable-no condition, Asimo responded "no" to eight of the questions and "yes" to two of the questions. And in the unpredictable condition, Asimo responded "yes" to five questions and "no" to five questions, in a random fashion. Participants then

reported how mindful Asimo seemed: the extent to which Asimo appeared to have a mind of its own, intentions, free will, consciousness, desires, beliefs, and the ability to experience emotions. Participants also reported how attractive, efficient, and strong they found Asimo to be, to measure the extent to which participants evaluated the predictable versus unpredictable behavior negatively. Results showed that Asimo seemed the most mindful when he behaved unpredictably, with no differences between the predictable-yes and predictable-no conditions. No significant differences emerged in any of the other measures, suggesting that anthropomorphism in this experiment stemmed from unpredictability rather than from negativity.

It is easy to imagine that results like these reflect ways of talking more than they do ways of thinking. That is, saying that your computer "has a mind of its own" is not the same as really *thinking* that your computer truly has beliefs and desires and emotions. The engineers that run the Tevatron know, at least explicitly, that the Tev does not really have moods; they are just speaking metaphorically. This is almost certainly true to some extent, but neuroimaging now allows psychologists to identify whether this is true to the *fullest* extent. The reason is that there are distinct neural regions that identify when people are thinking about their own and others' mental states. Perhaps the most reliable of these is the medial prefrontal cortex. Activity in this region can therefore be used to index the degree to which people anthropomorphize nonhuman agents (Castelli et al. 2002; Martin and Weisberg 2003). When a person cajoles her car to start on a cold winter morning or claims his computer has a mind of its own, is the mPFC active suggesting that people may be thinking quite literally about the mind of their car or computer?

To find out, participants in one experiment read descriptions of a variety of different gadgets (Waytz et al. 2010d). Some of these gadgets were described as being very unpredictable, whereas others were described as being very predictable. For instance, one of the gadgets was an alarm clock called "Clocky". This alarm clock has wheels on the side that spin when the user presses the alarm clock a second time, sending the alarm clock rolling around the room and requiring the snoozer to actually get up out of bed to shut it off. In the predictable description of Clocky, participants read that, "You can program Clocky so that when you press snooze, it runs away from you or you can program it so that when you press snooze, it will jump on top of you." In the unpredictable description, Clocky's behavior was described as being out of the user's control: "When you press snooze, Clocky either runs away from you, or it jumps on top of you." Outside the fMRI scanner, participants read descriptions of 32 different gadgets, half described as predictable and half as unpredictable. Inside the scanner, participants then evaluated the extent to which each gadget had "a mind of its own", as the measure of anthropomorphism. Consistent with our account, participants were more likely to report that the unpredictable gadgets had a mind of its own than the predictable gadgets. More important, subsequent analyses confirmed that the ventromedial prefrontal cortex was reliably more active when evaluating unpredictable versus predictable gadgets, and that differences in this neural activity predicted

differences in the extent to which participants anthropomorphized the gadgets. Reporting that one's computer has a mind of its own is not simply a way of speaking, but is a literal way of thinking.

The critical component of our account is that attributing a mind to a nonhuman agent is not purely automatic, but is rather triggered by distinct motivational states. Motivational explanations for behavior, such as our account of anthropomorphism, make three unique predictions that purely nonmotivational accounts do not make. First, motivational accounts predict that people who are especially motivated to explain and understand an agent's behavior should also be the ones most likely to anthropomorphize it, holding all else constant. One experiment (Epley et al. 2008) examined this prediction by first measuring participants' Desire for Control, an individual difference that serves as an indirect measure of people's motivation for mastery and understanding. Sample items from the scale include, "I like to get a good idea of what a job is all about before I begin," and "I enjoy having control over my own destiny." Participants then watched a short video of two dogs, one that moved slowly and predictably and another that moved quickly and unpredictably. Participants then reported their impressions of each of the dogs, as a measure of anthropomorphism. Participants reported the extent to which each dog was aware of its emotions, appeared to have conscious will, the extent to which it had a "personality," and also rated its similarity to other life forms on a scale ranging from 1 (bacteria) to 11 (human). The results, combined across these measures, showed that those high in desire for control were more likely to anthropomorphize than those low in desire for control, but only for the dog that behaved unpredictably. A humanlike mind emerged only in the dog that needed an explanation, and only among those who were particularly interested in having an explanation.

Second, motivational accounts predict that increasing motivation should increase the associated behavior. If people eat food because they are motivated by hunger, then making people hungry should increase eating. If anthropomorphism is triggered by the motivation to explain an agent's behavior, then increasing that motivation should increase anthropomorphism. Consistent with this possibility, participants in one experiment evaluated a robot after watching six brief videos of it in action (Waytz et al. 2010d). Some participants were motivated to explain the agent's behavior by asking them to predict what the robot would do after the end of each video and then paying them $1 for each correct prediction. The other participants were not motivated in this way. All participants then evaluated the robot's mental capacities: the extent to which they believed the robot had a mind of its own, intentions, desires, was conscious, and could experience emotions. Consistent with our motivational account, those incentivized to explain the robot's behavior also anthropomorphized it significantly more than those who were not incentivized.

Finally, motivational accounts predict that engaging in a motivated behavior should satisfy the motivational state. If people eat food when they are motivated by hunger, then making people eat should satisfy their hunger. If people anthropomorphize nonhuman agents partly because they are motivated to explain the agent's behavior, then not only should this motivation increase anthropomorphism,

but asking people to anthropomorphize should also provide satisfying explanation. To test this possibility, participants in one experiment watched videos of four different agents (a dog, robot, alarm clock, and geometric shapes). Participants were asked to describe two of these videos anthropomorphically and two objectively (based on random assignment). For those they were asked to describe anthropomorphically, participants were told to "think about it in the same way you would about other people… and to treat it as if it had humanlike traits, emotions, and intentions." For those they were to describe objectively, they were asked to "remain detached and think only about the observable behaviors it is performing and think about it as you might think about any other unfamiliar gadget… Watch its behavior closely and try to remain objective." Participants did as they were told, writing either anthropomorphic or objective descriptions of each agent they saw. When finished, participants reported how much they felt they were able to predict the agent's behavior in the future, as an indication of a satisfying explanation (White 1959).

Consistent with our motivational account, people reported feeling better able to predict the behavior of the agents they anthropomorphized compared to those they were asked to treat objectively. Heider and Simmel suggested this possibility for anthropomorphism many years before these data when describing their classic video of geometric shapes moving around a hinged box that quickly take on a mental life of their own:

> As long as the pattern of events shown in the film is perceived in terms of movements as such, it presents a chaos of juxtaposed items. When, however, the geometrical figures assume personal characteristics, so that their movements are perceived in terms of motives and sentiments, a unified structure appears… But motives and sentiments are psychological entities… They are "mentalistic concepts", so-called intervening variables that bring order into the array of behavior mediating them.
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> (Heider and Simmel 1944, pp. 31–32).

Without the language of mind, explanations of behavior provide no sense of understanding (even if the sense is, objectively speaking, illusory). Donald Hebb (1946) described a similar experience trying to avoid anthropomorphizing the chimpanzees in his care at the Yerkes Primate Laboratory:

> A thoroughgoing attempt to avoid anthropomorphic description in the study of temperament was made over a two-year period at the Yerkes laboratories. All that resulted was an almost endless series of specific acts in which no order or meaning could be found. On the other hand, by the use of frankly anthropomorphic concepts of emotion and attitude one could quickly and easily describe the peculiarities of individual animals… Whatever the anthropomorphic terminology may seem to imply about conscious states in chimpanzee, it provides an intelligible and practical guide to behavior (p. 88).

Even psychological science went through a period during the 1940s and 1950s when behaviorists disavowed all mentalistic language as subjective nonsense, insisting on describing behavior only in terms of its observable qualities. Human beings were, in essence, stripped of their minds altogether. Behaviorism ultimately failed to take over psychology not only because underlying cognitive processes really *do* matter for understanding behavior (Baumeister et al. 2011), but also

because behaviorism never really provided an explanation of behavior that any kind of psychologist would find satisfying (Chomsky 1957).

We believe the results reviewed in this section make two important points. First, people tend to attribute minds to other agents when they are in search of explanations, and tend to overlook the minds of others when nothing needs explaining. When your car, or cat, or particle accelerator works in a perfectly predictable fashion, it seems mindless. But when something unexpected happens, then a mind may emerge as a suitable explanation, producing anthropomorphism. The same happens with humans. The factory worker who does the same thing over and over and over becomes mindlessly predictable. The boss who views employees as a means to reaching another goal rather than an end to be explained in themselves views their employees as mindless objects (Gruenfeld et al. 2008). And doctors who are charged with explaining disease and physical disorders can find themselves quite unintentionally overlooking the minds of their patients (Haque and Waytz 2012). Second, anthropomorphic explanations are satisfying only when other explanations are unavailable. The language of mental states is an intuitive explanation for the behavior of almost any agent, but as more about an agent is learned, the tendency to use these default explanations should decrease as well. Hume was on to this when he argued that anthropomorphism stems from human being's "absolute ignorance of causes" (1757/1957, p. xix). Indeed, research demonstrates that rural children anthropomorphize nonhuman animals *less* than do urban children, presumably because rural children have more direct contact, experience, and knowledge of these animals than do urban children (Medin and Atran 2004). Anthropomorphism may be triggered by the need to explain behavior, but it is certainly not the only explanation that can be triggered.

## Anthropomorphism as Connection

The motive to explain behavior may partly explain anthropomorphism, but it is a terrible explanation for Julia Hill's anthropomorphic sense of Luna. Redwood trees sway in the breeze, but mostly they just stand there. They do not walk or talk. They do not move on their own. There is no event calling out for explanation, and no reason to suspect that Julia is pathologically driven by a motivation to understand or comprehend her universe in a way that would lead her to explain behavior that others do not observe.

There is also no perceptual trigger that would lead a person to think of the mind in a tree, no cues that this behemoth is in some way similar to a person or to the self. There is no humanlike face or humanlike motion. Trees are not lifeless, but they move so slowly that their behavior is detectable only through time-lapsed photography. Julia Hill's sense that she was receiving instructions from Luna, was hearing her inner voice, was feeling her suffering, did not come from any obvious physical feature of the tree itself. It came from something else.

Like any complicated phenomenon, attributing a mind to another agent is multiply determined. Another agent's mind matters not only for explaining the other agent's behavior, but also for forming a deep social connection with the other agent. To see this, think about trying to form a connection with someone on a first date. You start by being extremely sensitive to how you are coming across to the other person. You choose your clothes carefully to convey just the right kind of impression, and watch your words even more carefully to make sure you do not convey the wrong impression. You try to keep track of your date's preferences and interests, trying to ferret out the person's true attitudes and beliefs to see if you are a match made in heaven or hell. This guessing game requires a great deal of perspective taking, trying to put yourself in the other person's shoes, trying to get beyond surface appearances, and trying to think carefully about the other person's mind. Connecting with others requires mentalizing. This suggests that the motive to connect with others, or simply having a more approach oriented motivation toward others, may be an important motivational determinant of attributing a mind to another agent, whether it is a person or not. Luna became a mindful agent for Julia Hill because of a tight social connection, one that led her to recognize a mind in this tree that everyone else who was more disconnected would never recognize.

Several pieces of evidence suggest that a motivation to connect with others can increase anthropomorphism. First, some animals are more readily anthropomorphized than others. Just after a major earthquake struck Japan in 2011, for instance, a picture of a Panda Bear hugging the leg of a zookeeper made its way around the Internet. Ostensibly, this Panda was scared after an earthquake and was cuddling with its keeper for comfort. Notice how easy it is to make this inference about the mind of a panda. It is cute, cuddly, and exactly the kind of animal a person would naturally move close to. It is easy for such an approachable and likeable animal to seem mindful (even if the animal itself is actually reclusive and aggressive, like a real Panda Bear). In fact, biologists believe that the domestication of dogs was driven by "anthropomorphic selection" of traits that best enabled people to recognize a mind in their pet (Serpell 2003). The big eyes and baby-faced features of domestic dogs are much more approachable and socially engaging than the narrow eyes and long faces of their wolf ancestors.

But what if you saw a rat clinging to its zookeeper? Would you be as likely to believe it was scared after an earthquake? Probably not, and it is not simply because a rat's brain is smaller. Cuteness prompts social engagement, and may therefore lead to anthropomorphism, whereas ugliness prompts social disengagement and avoidance (see Sherman and Haidt 2011 for a review). In one intriguing experiment, participants looked at a picture of cute baby animals or of their less-cute adult equivalents (Sherman and Chandler 2012). Participants then evaluated four easily anthropomorphized gadgets (such as Clocky, described earlier). Participants reported that they would be more likely to anthropomorphize each gadget (specifically, to give it a name, to refer to it as "he" or "she" rather than "it", and to talk to it) after looking at the cute baby animals than after looking at the adult animals. Although this study did not measure the attribution of mental states directly, it provides some evidence that the approach-oriented motivation

that most people feel from seeing cute animals might prime anthropomorphic thinking, such that it then extends to other targets as well.

More direct evidence for a link between the motivation to connect with others and anthropomorphism comes from a study investigating perceptions of other humanlike minds. In these experiments, participants reported their impressions of the mental capacities of a very likeable or unlikeable person. Results demonstrated that the likeable person was rated as being more mindful than the unlikeable person (e.g., as having more complete feelings, being more capable of experiencing pleasure and pain, being more able to engage in a great deal of thought; Kozak et al. 2006). Neuroimaging evidence also demonstrates that regions of the brain that are reliably active when reasoning about the mental states of others are more active when people think about close others than when people think about more distant others (Krienen et al. 2010). This is surely part of the reason why ingroup members are rated as having consistently stronger mental capacities, such as the capacity to experience secondary emotions like love or joy or shame or guilt, than are outgroup members (Leyens et al. 2000). Minds emerge as others become more closely connected to one's own mind.

This importance of connection, it appears, even extends to our cars. In a survey described earlier in this chapter, people were asked to report the extent to which their cars seemed to have a "mind of its own" or to have its own "beliefs and desires" (Morewedge 2006). Earlier we reported that people rated their car as more mindful when it behaved less reliably or expectedly. But the strongest predictor of anthropomorphism in this survey was how much people reported liking their car. The more people liked their car, the more they perceived it to have a mind of its own.

The strongest evidence for the role of approach-oriented *motivation* in anthropomorphism, however, comes from experiments that either measure or manipulate people's motivation to connect with others directly. For instance, people in one survey completed a short measure of loneliness, and then rank ordered a list of 14 different traits that could be used to describe their pet (or a pet they knew well), from those that best described their pet to those that least described their pet. This list included three anthropomorphic traits related to providing social connection (thoughtful, considerate, and supportive), three anthropomorphic traits unrelated to providing social connection (embarrassable, creative, devious, and jealous), and seven nonanthropomorphic traits that are simply behavioral descriptions (aggressive, agile, active, energetic, fearful, lethargic, and muscular). Results demonstrated a small, albeit statistically significant, correlation between loneliness and the average rank of the supportive anthropomorphic traits, $r\ (167) = -0.18$. Loneliness was unrelated to rankings of the other traits.

A more recent test of this hypothesis by independent researchers (McConnell et al. 2011) using a more self-selected sample of pet owners (those recruited online for a "personality and pet evaluation" survey), also included a large number of additional questionnaires and assessed the correlation between loneliness and the *ratings* (rather than *rankings*) of the extent to which anthropomorphic traits describe a person's own pet on scales ranging from 1 (not at all true) to 9

(completely true). This survey found a slightly smaller (and statistically nonsignificant) relationship between loneliness and the scale ratings of anthropomorphic traits, $r = 0.12$, with a similar sample size. These authors also found a slightly stronger (and statistically significant) relationship between depression, another measure related to social wellbeing, and the extent to which people anthropomorphized their pets, $r = 0.19$. We think these results suggest that the relationship between loneliness and the tendency to anthropomorphize one's pet is likely to be weak, but weakly positive. Notice that pets are complicated targets of evaluation because much is already known about them, and so reflexive inferences (such as anthropomorphism) are likely to be minimized (Epley et al. 2007; Medin and Atran 2004). Notice also that if pets actually do provide significant social support because people treat them as humanlike companions, then anthropomorphizing one's pet should also reduce people's feelings of loneliness. Indeed, a survey of 1,000 pet owners revealed that 50% view their pet to be as much a part of the family as any other person in the household, with 25% even reporting that their pet is a "better listener than their spouse." Consistent with this, McConnell et al. (2011) found that thinking of a person's pet provided just as much of a psychological buffer to the pain of being socially rejected as thinking about one's best (human) friend. Another experiment reported that participants who were ostracized by another human being did not experience the same distress if they were in the presence of a dog than when they were alone (Aydin et al. 2012).

A better test of the relationship between approach oriented motivation and anthropomorphism would examine unfamiliar targets that do not provide any actual social support. We know of two experiments that have used such targets. In one survey, participants evaluated four different gadgets (such as Clocky) and then reported the extent to which each seemed to: have a mind of its own, have intentions, have free will, and experience emotions. Results demonstrated a significant, and large ($r = 0.53$, $n = 20$), relationship between loneliness and the average amount of mind attributed to these gadgets (Epley et al. 2008a). In another survey (Waytz et al. 2012), participants looked at images of celestial bodies taken from the Hubble telescope. For each one, participants again reported the extent to which each seemed to have a mind. And again, the more lonely people were, the more they anthropomorphized these objects in the universe ($r = 0.51$, $n = 28$).

These correlational findings suggest that the motivation to connect with others may increase anthropomorphism, but they obviously cannot provide evidence for this particular causal relationship. Equally plausible is that anthropomorphizing pets or gadgets or the universe makes people disconnected from other people. Demonstrating a causal link between the motivation to connect with others and subsequent anthropomorphism would require manipulating people's motivation to connect and then measuring anthropomorphism.

In one test following this design (Epley et al. 2008a), participants in one condition were induced to feel lonely by watching a short clip from the movie *Cast Away* in which the main protagonist (Tom Hanks) finds himself utterly alone on a deserted island. In another condition, participants were made to feel fearful by

watching a scary scene from the movie *Silence of the Lambs.* In a third condition, people watched a neutral clip taken from the movie *Major League*, a clip in which the main protagonists were neither afraid nor alone. In all cases, participants were asked to put themselves in the main protagonist's shoes and try to experience the emotions that he or she was feeling. After watching these clips, participants then evaluated a pet that they either owned or knew well, again rank ordering 14 traits from those that best described their pet to those that least described their pet. Those made to feel lonely were more likely to describe their pet using supportive anthropomorphic traits than whose made to feel afraid or those in the control condition. As an additional measure related to anthropomorphism, these participants also reported the extent to which they believed in a variety of supernatural agents, including God, the devil, and angels. One prominent theory of religion is that these agents are themselves the product of anthropomorphizing natural events (Guthrie 1993), one that is a byproduct of people's ability to reason about the minds of others (Bering 2006; Atran and Norenzayan 2004). Consistent with this account, this experiment also found that those induced to feel lonely also reported a stronger belief in these religious agents than those in the fear or control conditions (see also Aydin et al. 2010; Epley et al. 2008, Exp. 2; Gebauer and Maio 2012).

Altogether, we believe these results demonstrate that the motivation to connect with others enables anthropomorphism, and that we are more likely to attribute a mind to agents to which we are closely connected than those with which we are disconnected. These attempts to humanize nonhuman agents by giving them a mind appears to be satisfying, although it is not entirely clear based on the existing research whether the social support people derive from their pets or their connections to religious agents come from their anthropomorphic qualities in particular. What is clear at this time, we believe, is that minds emerge in others as people attempt to get close to others, regardless of whether "others" are people, pets, or—in the case of Julia Hill—a particularly large tree.

## From Motivated Anthropomorphism to Unmotivated Person Perception

The scientific study of anthropomorphism has always existed at the fringes of psychological science. For some researchers, the main concern is not understanding the psychological processes that trigger and guide anthropomorphism, but rather whether it is accurate or not. This requires studying the minds of animals or Gods or machines, and so the problem is shifted to animal behaviorists or theologians or computer scientists. For other researchers, anthropomorphism seems more silly than serious, an exercise in talking with metaphors or failing to outgrow childish ways of thinking. But for most relevant researchers, psychology is about the interactions between those who have a psyche—that is, between human beings in their everyday social lives. How people think about non people is not a central topic.

And so the study of anthropomorphism is the kind of topic within psychology that gets discussed in the hallways of major conferences rather than in the main meeting rooms.

In some ways, this is as it should be. It is interesting to know whether our pets are capable of the kind of thinking we attribute to them (Horowitz 2009), and anthropomorphism is sometimes just a way of speaking that diminishes as people get older. There are also more pressing matters for psychologists to attend to than whether an alarm clock seems to have a mind of its own or why a woman might think she is receiving instructions from a tree. Psychology, particularly social psychology, should always be firmly focused on human social interaction, because it is what ordinary perceivers care the most about.

We think, however, it is time to bring research on anthropomorphism out of the hallways and into the meeting rooms, because its careful study tells us a great deal about how people think about other people. In particular, we think it tells us a great deal about why people sometimes fail to attribute minds to other people (dehumanization), why some people seem particularly unable to reason about the minds of others (such as individuals with autism spectrum disorders), and why most people are actually less social than they should be for their own wellbeing.

*Dehumanization*. Anthropomorphism, we believe, is guided by the basic mechanisms that govern engagement with the minds of others. When other minds matter, either because they need to be explained or they are desired sources of social connection, then a person may employ their capacity to reason about the minds of others. When other minds are irrelevant—there is no motivation to explain or connect with the minds of others—then this capacity may not be employed. Reasoning about the minds of others is not a default state. It requires some motivation to engage with the minds of others. Instead of being an automatic process employed nearly universally, it is a tool that people must be motivated to use.

The motivated nature of mind attribution is often overlooked in research involving other people, because the presence of mind in others is generally assumed. However, the inverse process of anthropomorphism when evaluating other people is dehumanization—failing to attribute humanlike mental capacities to other people, and therefore evaluating (or treating) them as relatively mindless animals or objects. Historically, dehumanization has been considered to be a product of antipathy. The Nazis dehumanized the Jews, the Hutus dehumanized the Tutsis, and whites in the United States have dehumanized blacks presumably out of hatred and prejudice. Research on anthropomorphism, however, suggests that a different mechanism may also be at work in some of these cases. Instead of antipathy, dehumanization may result from apathy—indifference to the minds of others. As George Bernard Shaw (1901) pointed out, "the worst sin towards our fellow creatures is not to hate them, but to be indifferent to them. That's the essence of inhumanity." Might being indifferent to the minds of other people lead to dehumanization of those people, which could in turn generate some of the hatred and dislike commonly observed in cases of dehumanization?

Several findings are consistent with this account. Being in a position of power, for instance, enables freedom to pursue one's own goals and a diminished need

to rely on others. Those in positions of high power are therefore less attentive to other people than are those in low positions of power (Fiske 1993). When powerful people do need others to achieve their goals, they appear more likely to objectify them as instrumental tools needed to achieve one's own goals than people who are in low positions of power. (Gruenfeld et al. 2008). Such objectification does not come from some deep-seeded hatred of the powerless by the powerful, but rather from indifference to the full complement of mental attributes that make other people fully human.

High social status yields similar results, with those who think they are of high social status being more indifferent (less compassionate) to the suffering of others than those who think they are of low social status (Van Kleef et al. 2009). Again, being at the top of the social hierarchy need not make people hate those who are lower on the social hierarchy to produce these results. It could come from in diference to the minds of others. In one experiment, those high in social status were less able to recognize another person's emotion from a photograph than those who were relatively low in social status (Kraus et al. 2010).

Most directly relevant to this hypothesis, one series of experiments suggests that satisfying people's motivation to connect with other people can actually increase the tendency to dehumanize more distant others (Waytz and Epley 2012). In one experiment, participants who wrote about someone they felt closely connected to were more likely to dehumanize outgroup members (in particular, to see them as having weaker mental capacities) than those who wrote about someone to whom they were not connected. These outgroups spanned the spectrum of social evalvations (Harris and Fiske 2006), including groups high and low in warmth (e.g., middle class Americans vs. drug addicts) as well as those high and low in competence (e.g., rich people vs. disabled people). No differences in liking for these groups emerged, demonstrating that dehumanization can emerge without disliking. In another experiment, participants reported their impressions of terrorist detainees while sitting on opposite sides of a room with one's friend or with a stranger. Those who arrived at the lab and participated with a friend should feel more socially connected than those who arrived and participated with a stranger. Consistent with our hypothesis, those in a room with a friend also dehumanized the mental capacities of these detainees more than those who participated with a stranger, and as a result was also more willing to endorse the use of harsh interrogation tactics on these detainees. A more recent study suggested that merely being reminded of close social connections by using one's cell phone or viewing an image of the cell phone decreased prosocial behavior toward strangers, also suggesting that social connection can increase dehumanization (Abraham et al. 2012; see also Bastian and Haslam 2010). Being part of a tightly connected group is good for a person's own health and happiness, but it may not be good for enabling them to connect with the minds of more distant others.

At this point, there is not enough evidence to say whether apathy—the lack of motivation to connect with other minds—plays a bigger or smaller causal role in cases of dehumanization than antipathy—an outright hatred or dislike of other mind. However, we think psychologists would do well to remember a version of

"Hanlon's Law:" never attribute to malice that which can be attributed to stupidity. The objectification of women or the dehumanization of outgroups or the animalistic tendencies attributed to those who are distant from one's own mind may result from the lack of motivation to think more carefully about the minds of others rather than from explicit prejudice toward these others.

*Atypical social cognition*. The modal course of human development has children learning about the minds of others from the very instant they are born, or at least as early as mothers will allow their infants to be studied by psychologists. In these early moments, infants will orient toward their mother's voice (DeCasper and Fifer 1980), imitate another person's behavior (Meltzoff and Moore 1977), and will look preferentially at human faces (Sherrod 1979). This early social motivation provides the input necessary to develop an understanding of how other minds work, and enables the social capacities that eventually allow people to reason in sophisticated detail about the minds of others. Not all infants, however, follow this modal path. Some adults, namely those diagnosed with autism, seem to lack these most basic social skills. The dominant view among psychologists over the last 20 years has been that those diagnosed with autism lack the fundamental ability to reason about other minds. In particular, they lack the neural module that allows people to theorize about how other minds work (Baron-Cohen 1995).

This view is changing. In particular, research now suggests that the social deficits observed in autism may stem from a lack of motivation to connect with the minds of others rather than from an inherent inability to do so (Chevallier et al. 2012a, b). Those diagnosed with autism, from infancy, seem relatively indifferent to other people compared to normally developing infants. Within the first year of age, those later diagnosed with autism show diminished sensitivity to hearing their own name, are more socially distant, and exhibit less eye contact (Jones et al. 2008; Osterling et al. 2002). As they age, those later diagnosed with autism do not look at other people in social scenes as normally developing children do but instead look at background objects (Riby and Hancock 2008; see also Klin et al. 2002). As adults, those with autism do not seem to experience either the pains or pleasures—key elements of any motivational system—of connecting with others. Those with autism do not behave more desirably when in the presence of others, suggesting diminished interest in managing their impressions in the eyes of others (Chevallier et al. 2012b; Izuma et al. 2011). Those with autism typically report having no friends (Howlin et al. 2004), but do not report the pain of feeling lonely as do normally developed adults (Chamberlain et al. 2007). Most important, motivating those with autism to perform better on social tasks does increase their performance, consistent with a deficit in the motivation to reason about others rather than an inability to do so (for a review see Chevallier et al. 2012a).

This view of diminished social motivation rather than diminished social ability is also consistent with some findings from the social psychological literature involving normally developed adults. For instance, women tend to reason somewhat more accurately about the minds of others than do men, a gender difference that is pronounced enough among those with autism that Baron Cohen has referred to the autism as a case of the "extreme male brain" (2002). However, gender

differences in performance on social cognitive tasks between men and women are often relatively small (Ickes 2003), and some seem to be produced by differences in motivation rather than differences in actual ability (Graham and Ickes 1997). When men are more motivated to reason about the minds of others, then gender differences are reduced (if not eliminated; Hall and Schmid-Mast 2008; Ickes et al. 2000). Men and women may not differ as much in their ability to reason about the minds of others as they do in their interest in doing so.

We think this emerging view of autism may call for a reinterpretation of some existing evidence in the psychological literature. Most relevant to anthropomorphism, one well-known lesion study described a patient with amygdala damage who seemed to exhibit good social functioning but did not anthropomorphize the classic Heider and Simmel (1944) video of geometric shapes. Heberlein and Adolphs (2004) interpreted this deficit as stemming from an inability to process emotional information. However, the amygdala does not seem to be involved with emotional processes as much as it is a marker for motivational relevance in the brain, one that identifies stimuli that deserve attention and those that do not (Cunningham and Brosch 2012). Instead of an inability to process emotions, we think this lesion patient lacked the motivational trigger necessary to care about explaining the shapes in the first place. Indeed, those diagnosed with autism also show differences in amygdala responses to social stimuli, a finding again consistent with a lack of motivation to attend to social stimuli rather than an inability to do so. As any parent of a poor-performing high school student will attest, it is good to remember that differences in performance may not reflect differences in ability but rather differences in interest and effort.

*Personal wellbeing.* Normally developed adults do not have autism, but they sometimes act like they might. Although Aristotle argued "man is by nature a social animal," it is not at all uncommon for people to come in close contact with strangers and completely ignore each other. Every day in waiting rooms and coffee shops, walking on sidewalks or standing on street corners, sitting on planes and trains, people can be mere inches from another person and treat that person as they would a lampshade.

As social as human beings seem to be, and as much as people's ability to connect with the minds of others enables both happiness and health (Diener and Seligman 2002), people can at times seem completely unmotivated to use their unique social skills. In the modern world, the human motivation to consume food seems miscalibrated in a way that pushes people toward consuming too much. In the modern world, where most social interactions are relatively safe and opportunities to interact with outgroups is widespread, is the human motivation to connect with others biased toward "consuming" too little? The experiences of ignoring others in waiting rooms or on planes is not all that much different from the social indifference observed among those diagnosed with autism, and is an everyday form of indifference toward others. Would people be happier if they were more motivated to actually use their ability to reason about others' minds? If all of us became just a little bit more socially motivated than we already are?

Consider three sets of experiments that look at the consequences of increasing social motivation. In one, participants were asked to act extroverted or introverted. In both a 2-week diary study and in a 1-hour laboratory discussion group spanning, participants were happier being extroverted than introverted (Fleeson et al. 2002).

In another (Epley and Schroeder 2012), commuters in Chicago traveling on trains and in busses were assigned randomly to one of three conditions. In one condition, participants were asked to be more social: to try to connect with a person sitting next to them on their ride. In the second condition, participants were asked to be less social: to keep to themselves and "enjoy your solitude". In the third, participants were asked to do whatever they normally do. Both on the trains and on the busses, those asked to connect with the person sitting next to them reported having a more pleasant commute and were in a better mood than those asked to "enjoy their solitude". Interestingly, there was also no reported difference between conditions in how productive people reported their commute to be. Connecting with a stranger is more pleasant than sitting alone, but no less productive. If connecting with others makes people happier and healthier, then why do people not connect? Additional experiments provided the answer: Because people in these contexts appear to believe that connecting with others will be unpleasant. When commuters from the same populations were asked to predict how they would feel in each of these conditions, they consistently predicted having the least pleasant, least positive, and least productive commute when they tried to connect with another person. Evolution can give people the social tools that enable happiness and health, but it may not set them at the optimal level of motivation in modern life to use them.

## Conclusion

Few would argue that you can have mental experiences without a brain, which means that no amount of arguing would convince most people that a tree is capable of giving instructions, screaming in pain, or suffering when cut. Those who might argue otherwise can sound crazy or delusional, as people who might be suffering from some kind of psychological disorder or stuck in some infantile stage of development. We have tried in this chapter to take such extreme cases of anthropomorphism—cases when a person attributes a mind to a nonhuman agent—and describe the perfectly normal processes that might explain it.

We have argued that this phenomenon is guided by the same psychological processes that enable people to reason about the minds of other persons, and that those processes are guided at their most fundamental levels by two basic human motivations—the motivation to explain or understand another's behavior and the motivation to form a social connection with another agent. Far from being an automatic psychological process, attributing a mind to another agent first requires engagement with that agent, a reason to care about the mind of that agent, and a

reason to think about the inner mind of that agent. Lacking this motivation, we believe, is also central to instances of dehumanization in which people fail to recognize the mind of another out of apathy, gives insight into specific social cognitive disorders (such as autism), and can lead people to subtly treat others as objects in their everyday lives in ways that diminish one's own happiness. Understanding how specific motivations guide the inferences people make about the inner lives of others helps to explain the most fundamental divide in all of social life—the differences between *us* and *them*.

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