CHAPTER TWO

Through a looking glass, darkly: Using mechanisms of mind perception to identify accuracy, overconfidence, and underappreciated means for improvement

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Abstract

People care about the minds of others, attempting to understand others' thoughts, attitudes, beliefs, intentions, and emotions using a highly sophisticated process of social cognition. Others' minds are among the most complicated systems that any person will

ever think about, meaning that inferences about them are also made imperfectly. Research on the processes that enable mental state inference has largely developed in isolation from research examining the accuracy of these inferences, leaving the former literature somewhat impractical and the latter somewhat atheoretical. We weave these literatures together by describing how basic mechanisms that govern the activation and application of mental state inferences help to explain systematic patterns of accuracy, error, and confidence in mind perception. Altering any of these basic processes, such as through perspective taking or increasing attention to behavioral cues, is likely to increase accuracy only in very specific circumstances. We suggest the most widely effective method for increasing accuracy is to avoid these inference processes altogether by getting another's perspective directly (what we refer to as perspective getting). Those in the midst of understanding the mind of another, however, seem largely unable to detect when they are using an effective versus ineffective strategy while engaging in mind reading, meaning that the most effective approaches for increasing interpersonal understanding are likely to be highly undervalued. Understanding how mind perception is activated and applied can explain accuracy and error, identifying effective strategies that mind readers may nevertheless fail to appreciate in their everyday lives.

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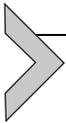
1. Introduction

   Tyler Clementi had just started his first year as a student at Rutgers University when he decided to walk onto the George Washington Bridge in New York City after posting a note on his Facebook page: "Jumping off the gw bridge sorry." Tyler's tragic walk was triggered only 3 days earlier when he asked his roommate, Dharun Ravi, if he could have the room alone for a date. Unbeknownst to Tyler, Dharun had enabled a webcam that later recorded Tyler making out with another man. Dharun broadcast his webcam video live for his friends to see, and did so again two nights later. Tyler noticed this second time and realized an unwanted disclosure of his sexual identity had made him a minor celebrity in the dorm's social network. Deeply distressed by what others might think of him, and how he expected to feel in the weeks, months, or years to follow, Tyler made a fateful decision to take his own life.

   This painful story exemplifies the complicated psychological dynamics of everyday social life. Guiding everyone's choices in this example was a series of highly sophisticated inferences about the minds of others, from guessing others' impressions, emotions, or intentions in the present to anticipating those same mental states both for oneself and others in the future.

Social behavior is not simply guided by knowledge of others' observable actions, but also by subjective inferences about others' inherently invisible mental states. Human beings are mind readers.

This example highlights how the capacity to think about the minds of others is activated selectively, creating sensitivity and empathy for some people, such as Dharun trying to impress his friends, while leading to insensitivity and indifference to the minds of other people, such as Dharun failing to consider the pain he could be causing to his roommate. Being able to understand the minds of others is one of the human brain's most impressive capacities, but it has to be activated to function.

This example also highlights how mistakes can be made once people are actively thinking about the minds of others. Suicide represents such a painful tragedy because it routinely relies on mistaken inferences about how negatively one is being viewed by others, or by overestimating the durability of one's current emotions. "When a gay teenager commits suicide," says Dan Savage, founder of the *It Gets Better* project, "it's because he can't picture a life for himself that's filled with joy." Of course, this is not limited to gay teenagers. Eighties rocker and suicide-attempt survivor, Rick Springfield, tells the same story from the other side of the lowest point in his life: "If the rope had held, I would have missed out on a lot of amazing stuff in my life." Springfield's advice, like arguably every other psychological counselor, is to look beyond your immediate perspective: "Give it a year, because your life will change." Understanding the processes that guide mind perception can explain why people might overestimate how harshly they are being judged by others, why people might overestimate the continuity of their own mental states over time, and what might be done to systematically increase people's ability to understand the minds of others.

Finally, this example highlights the stakes at hand. Mental state inferences affect the experienced quality of our social relationships and guide social behavior. The quality of social relationships is a major determinant of happiness and health, far exceeding the impact of money on happiness (Kahneman & Deaton, 2010) and rivaling the effect of cigarette smoking on mortality (Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988). Existing research demonstrates that loneliness is not just a consequence of lacking social connection, but is also caused by mistaken inferences about how one is being evaluated in the eyes of others, or about the positive consequences of social interaction on wellbeing and health (Cacioppo & Patrick, 2008). Misunderstanding the minds of others meaningfully affects both the quality and quantity of life.

In this chapter, we integrate decades-long research programs by researchers across multiple subfields that connect the psychological processes that enable mind perception to the outcomes of these inferences, especially to the accuracy of mental state inferences. Accurate understanding is critical for effective functioning because it enables social intelligence, allowing people to flexibly adapt to the complex demands of social life (Schmid Mast & Hall, 2018). This work began in earnest during the first half of the 20th century as psychologists attempted to understand how accurately people judged each other across a haphazard collection of both personality traits and mental states. This work proceeded for decades but produced little in the way of replicable results or accepted facts, instead generating "a rash of results which are interesting, statistically significant, and exasperatingly inconsistent" (Cronbach, 1958, p. 353). According to Gilbert (1998), inconsistent results, imperfect measurement, incomplete theorizing, and inappropriate statistical analyses led psychologists to abandon the assessment of accuracy in favor of assessing the psychological processes that guide social judgment (beginning with Heider, 1958). Roughly 50 years of subsequent work in social cognition—studying stereotyping, causal attribution, and components of dispositional inference—identified the basic psychological processes people use to judge each other. These advances have allowed psychologists in the early 21st century to earnestly renew the study of interpersonal accuracy and use the processes of social judgment to make more systematic predictions about variance in the accuracy of judgment, to identify systematic error that these psychological processes produce, and to identify more effective strategies that people might use to understand each other.

Here we review research on mind perception, one relatively focused category of social cognition that involves attributing a set of psychological characteristics, including beliefs, attitudes, emotions, and intentions, to others. It involves utilizing what developmental and cognitive psychologists commonly refer to as one's "theory of mind": a set of beliefs about how mental states guide behavior (Frith & Frith, 2005). Mind perception is functionally distinct from the inferences people make about others' bodies, personality traits, or other personal attributes, guided by a unique network of neural structures and psychological processes (Bruneau, Jacoby, & Saxe, 2015; Koster-Hale et al., 2017) that serve as inputs into the dispositional inferences that people make about others' enduring traits (Malle & Holbrook, 2012). The capacity to reason about others' minds appears to distinguish humans from our nearest primate ancestors. By the age of 2,

human toddlers are similar to adult chimpanzees and orangutans in reasoning about problems involving physical objects, but perform significantly better when solving problems that require inferences about others' minds (Herrmann, Call, Hernàndez-Lloreda, Hare, & Tomasello, 2007).

Like most cognition, inferences about the minds of others are goal-dependent, aimed at providing a causal analysis in order to understand another agent's behavior in the present, to predict its behavior in the future, to connect and affiliate with an agent, or to identify enduring traits and dispositions in another person. Mind perception is therefore activated by motivations to explain, control, or predict another's behavior. Lacking those goals can lead people to disregard others' mental states, treating others with insensitivity or indifference, or leading people to think about others as being relatively mindless. Once activated, mental state inferences are guided by at least three psychological processes: egocentric projection, stereotype application, and behavioral inference. The first two are top-down processes guided by a perceiver's existing knowledge or beliefs, whereas the latter is a bottom-up process that requires obtaining individuating information from another agent through observed behavior. Each process creates predictable accuracy in judgment but also predictable error, helping to explain the modest accuracy rates typically observed in mental state inferences. Because people rarely get clear feedback about the accuracy of their judgments, confidence in one's inferences may be somewhat disconnected from accuracy, creating systematic patterns of overconfidence and insensitivity to the strategies that enable accurate inference. Existing efforts to increase the accuracy of interpersonal judgment have generally focused on modifying top-down processes of egocentrism or stereotyping, neither of which are likely to be systematically effective across the wide range of naturalistic inferences that people make in their daily lives. We suggest that systematically increasing accuracy requires increasing the diagnosticity of bottom-up cues received about the mind of another person, thereby avoiding top-down inference processes altogether instead of trying to optimize them.

2. Does it have a mind?: Activating mind perception

Others' mental states are inherently invisible. You cannot see a want, hold an attitude, or poke an intention. Over time, children develop an increasingly sophisticated representation of another's mind, but attention, motivation, and effort are still required to engage these processes in the midst

of everything else one might attend to at any given moment. An old joke caricatures the issue. A man standing on one side of a river shouts to a man standing on the other side. "Hey, how do I get to the other side of the river?" The other man responds, "You *ARE* on the other side of the river!" Interpreting another's behavior accurately requires understanding unique psychological perspectives.

This seems obvious to most adults, but it is a realization that adults appear to grow into over time rather than a recognition they were born with. Jean Piaget, for instance, noted decades ago that children tend to be highly egocentric, treating others as if they generally lack awareness that another's perspective might differ from their own. Piaget would sit children in front of a topographical scene showing three mountains with objects in the valleys. The mountains obscured some of the objects from view if you were seated on the other side of the scene. Children, however, were relatively insensitive to the viewer's vantage point. If a child could see an object, then they would generally assume that another person could see the same object regardless of where the other person was sitting (Piaget & Inhelder, 1956; see also Higgins, 1981).

Growing up provides many opportunities to learn that another's mind differs from one's own, and hence solving this "mountain" problem is child's play for adults. Piaget assumed that adults therefore outgrew egocentrism as they developed. But carefully monitoring adults' attention reveals that another's mind still requires some time and attention to consider, meaning that adults do not outgrow their childhood tendencies but rather correct them when it seems appropriate.

Consider an experiment conceptually similar to Piaget's 3-mountain problem that we conducted with children aged 4–12 (average was 6.2 years) and their parents (Epley, Morewedge, & Keysar, 2004). In this version, one person (the "mover") sits on one side of a 5 × 5 grid of boxes filled with objects (Keysar, Barr, Balin, & Brauner, 2000; adapted from Glucksberg, Krauss, & Higgins, 1975). Another person (the "director") sits on the other side of the grid and tells the mover how to rearrange the objects in the grid. Some of the boxes are covered up from the director's perspective, meaning that he or she cannot see the object inside it. This is also obvious from the mover's perspective, leaving both people aware that their own perspective is unique.

On four critical trials, the director gives an instruction that requires attention to the director's mind in order to interpret it correctly. For instance, the grid contains three trucks that are clearly visible from the Mover's

perspective: one small truck, one medium–sized truck, and one larger truck. The smallest truck, however, is hidden from the director's view but visible to the actor. On the critical trial, the director asks the Mover to move the "small truck." Where the Mover looks, as measured by a video camera located in the center of the grid, and what they actually reach for, will capture how Movers are thinking during this interaction. If Movers are spontaneously considering the director's mind, then they will look immediately at the medium sized truck from their perspective and will also move it. If, however, people are insensitive to the director's mind, then they will ignore his or her vantage point and simply move the truck that seems small from the Mover's perspective, thereby looking at and subsequently moving an object the director could not actually see.

   Results indicated that children tended to act exactly as Piaget would have predicted, looking first at the "hidden" object suggested by their own egocentric interpretation and only subsequently looking at the correct object indicated by the director's vantage point. As can be seen in Fig. 1, children also made a mistake 51% of the time, on average, by reaching for the "hidden" object. Adults, however, also showed this same pattern of behavior. Adults were just as likely as children to look at the hidden object (82% and 83%, respectively), and also tended to look first at the hidden object. What differed is that adults were more likely to subsequently look at the correct object, and were also less likely to reach for the wrong object (21% of the time, on average). Considering the mind of another
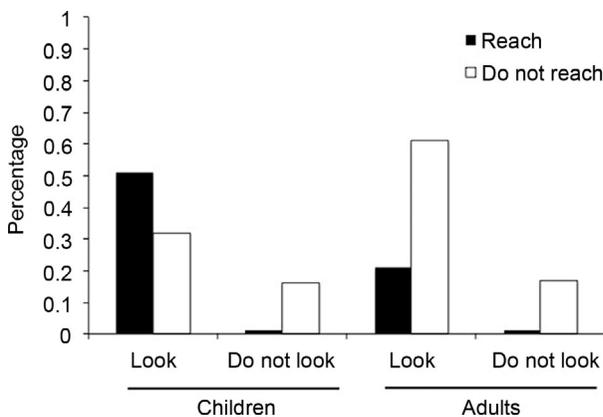

Fig. 1 The relations, for children and adults, between looking at the egocentric hidden object during a critical trial and reaching for the egocentric object (Epley, Morewedge, et al., 2004).

person in a live interaction is not automatic when there are other processing demands capturing one's attention.

Similar evidence comes from a long list of experiments in social psychology demonstrating that explicit instructions to consider another person's perspective have demonstrable effects on judgment and behavior (e.g., Batson, Early, & Salvarani, 1997; Galinsky & Moskowitz, 2000; Galinsky, Wang, & Ku, 2008; Genschow, Florack, & Wänke, 2013; Steffel & LeBoeuf, 2014; Vorauer, 2013). These effects would not emerge if people were automatically considering others' minds to begin with. Consider an experiment in which we asked pairs of participants to play a Prisoner's Dilemma game (Epley, Caruso, & Bazerman, 2006). Each person in this game chooses to either cooperate or defect with his or her partner. The amount of money each person wins is a function of what both participants choose. It seems obvious that people in this task would need to think about their partner's mind, and consider how their partner was thinking about the task and what he or she was likely to do. It does not, apparently, seem so obvious to all participants themselves. Compared to a control condition that simply made a choice, explicitly asking one group to consider their partner's thoughts and likely actions cut cooperation roughly in half from 60% to 27%. These results suggest that a meaningful percentage of people in the control condition were coordinating their behavior with another person without actually considering the other person's likely thoughts and actions.

If considering another's mind requires some motivation and effort, then knowing the motivations that trigger mind perception should enable a better understanding of when these processes will guide judgment or behavior and when they will not. "Thinking is for doing," as psychologists know well (Fiske, 1992; James, 1890). Mind perception provides a causal analysis of others' behavior, enabling explanation, understanding, and the capacity to predict another's future behavior. Heider and Simmel (1944) recognized this decades ago when they showed people a film of animated shapes. The shapes moved around the screen in a pattern that was almost instantly recognized by all observers as mindful activity, with the figures quickly taking on emotions, intentions, and future plans. The reason was obvious to Heider and Simmel: "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, … a unified structure emerges." (pp. 31–32). Although not as precisely defined at the time, these "personal characteristics" were almost entirely mental states of intentions, motives, goals, and beliefs.

2.1 Consequences: Anthropomorphism and dehumanization

Understanding the activation of mind perception can help to explain two broad categories of consequences that can result from failing to consider the mind of another person in the midst of an interaction (Waytz, Gray, Epley, & Wegner, 2010). First, you might treat another person in a way that is simply insensitive to his or her mental states, such as the joke described in the opening paragraph of this section. As one illustration of this possibility, consider gift giving where it is often said that, "it's the thought that counts." This saying suggests a person's appreciation or gratitude for a gift is driven not just by the objective value or liking of the gift, but also by the degree of thoughtfulness that went into the gift. Notice, however, that there are two aspects of a gift that needs to be evaluated: the perceived value of the gift itself, and the amount of thought that the gift giver put into the gift. Because valence—the extent to which a gift is liked or disliked—tends to be evaluated relatively automatically (Bargh, Chaiken, Govender, & Pratto, 1992; Duckworth, Bargh, Garcia, & Chaiken, 2002; Fazio, 2001; Greenwald, Klinger, & Liu, 1989) but another's mind is considered only when triggered to do so, a gift giver's thoughtfulness may affect a recipient's appreciation for a gift only when it triggers a need for explanation. In gift giving, perhaps the most common unexpected outcome is when a good friend who should know you well nevertheless gives you a bad gift.

A series of experiments we conducted (Zhang & Epley, 2012) supported this hypothesis. In one, people recalled a gift they received that they either liked or disliked, or recalled a gift they gave to another person that they believed was liked or disliked. As expected, only in the disliked gift condition did we observe a significant correlation ($r = 0.80$) between the recipient's positive evaluation of the gift exchange (i.e., a composite score of participants' reports of how much they appreciated the gift, how grateful they felt, and how much they liked the gift giver) and the gift giver's presumed thoughtfulness (i.e., a composite score of participants' reports of how much thought they believed the gift giver put into the gift and how much they cared about whether the receiver would like the gift). We observed no meaningful correlation in the liked gift condition ($r = -0.14$) between recipients' positive evaluation of the gift exchange and the gift giver's presumed thoughtfulness. Gift givers, who were already well aware of their thoughtfulness and hence did not need to be motivated to consider it, did not show this same pattern but instead presumed their thoughtfulness would be appreciated by recipients in both the liked ($r = 0.47$) and disliked ($r = 0.28$) gift conditions. In another experiment, a gift was made to seem

either relatively good or bad by being shown in comparison to either a less desirable or more desirable gift. Again, gift recipients' positive evaluations of the gift exchange were affected by the gift giver's presumed thoughtfulness only when the gift was made to seem relatively undesirable. In the absence of a trigger to consider the gift giver's mind, gift receivers' reactions were indifferent to their gift givers' presumed intentions and thoughtfulness. Only when triggered to think about a gift giver's mind did their thoughts actually "count" in a recipient's evaluation.

The second broad consequence of activating mind perception is influencing the extent to which you think another agent actually has a mind—that is, the degree to which another agent is perceived to possess sophisticated mental capacities (Waytz, Epley, & Cacioppo, 2010; Waytz, Gray, et al., 2010; Waytz, Morewedge, et al., 2010). Considering the mind of another agent, after all, presupposes that they have a mind to be considered, whereas failing to consider another's mind might lead to perceptions that another agent is relatively mindless. Surveys indicate that people tend to conceive humanlike minds as capable of two fundamental capacities: thinking and feeling (or agency and experience; Gray, Gray, & Wegner, 2007). This two-dimensional nature of mind has emerged in several other independent lines of research including intuitive representations of personhood that distinguish between human uniqueness (thinking-related capacities like rational, logical, and self-restraint) and human nature (feeling-related capacities like emotionality, interpersonal responsiveness, and warmth; Bain, Kashima, & Haslam, 2006), as well as the two fundamental dimensions of social judgment that distinguish between competence and warmth (Cuddy, Fiske, & Glick, 2008) or agency and communion (Abele & Wojciszke, 2007; Wojciszke, 1994). Minds are presumed to vary along a continuum of these two fundamental capacities. Motivations that trigger mind perception processes also affect the tendency to perceive relatively more or less mind, on either capacity, in others.

For instance, people are more likely to attribute a mind to a nonhuman agent—like a clock or a vacuum cleaner or a car—when it behaves unpredictably and therefore needs to be explained. When people in one of our experiments learned that one of four different gadgets behaved in a somewhat unpredictable fashion, they were also more likely to report that it appeared to have a "mind of its own" and could "experience emotions" (Waytz, Epley, et al., 2010; Waytz, Gray, et al., 2010; Waytz, Morewedge, et al., 2010). When your computer behaves exactly as you would expect, then it's just mindless machinery. But when it crashes randomly

throughout the course of your day, or opens software at random times, then it might seem like there is some semblance a mind within your machine (Morewedge, 2009).

Similarly, being motivated to form a social connection with another agent may also make it seem more mindful. Self-reported loneliness, for instance, is positively correlated with the extent to which pets and mechanical gadgets are reported to have humanlike mental capacities (Bartz, Tchalova, & Fenerci, 2016; Epley, Akalis, Waytz, & Cacioppo, 2008). Likewise, experimentally inducing a desire to connect with another agent by experiencing loneliness or ostracizing a person has been found to increase the perceived humanlike mental capacities of pets and gadgets, to increase belief in mindful gods, and to increase preferences for anthropomorphized consumer products (Aydin, Fischer, & Frey, 2010; Chen, Wan, & Levy, 2017; Epley, Akalis, et al., 2008; Epley, Waytz, Akalis, & Cacioppo, 2008). Inversely, decreasing the desire to connect with others has been found to do the opposite in perceptions of pets (Bartz et al., 2016) and other people (Waytz & Epley, 2012).

These results matter because they inform our understanding of two deeply important phenomena in everyday life: anthropomorphism and dehumanization (Epley, Waytz, & Cacioppo, 2007; Haslam, 2006). Anthropomorphism involves the attribution of humanlike capacities to nonhuman agents, whereas dehumanization involves the failure to attribute humanlike capacities to other human beings. Because a sophisticated mind seems to be a defining feature of people's conception of humanity, anthropomorphism and dehumanization reflect the operation of the same kind of mind perception process directed at different targets (nonhumans and humans, respectively). When triggered to think about the mind of a nonhuman agent, people are more likely to think about the agent's underlying mental capacities and hence more likely to anthropomorphize them. When lacking any trigger to think about the mind of another human being, then people may perceive the person to be relatively less mindful.

Given that minds are presumed to vary along two dimensions, more sophisticated predictions can be made based on which dimension most captures a person's attention and therefore guides their inferences. For instance, objects of sexual desire (usually women) have long been presumed to be objectified, treated as a tool to be used for bodily satisfaction (Kant, 1779/1997; Nussbaum, 1995). When attention is called to another person's body instead of to the person's mind, then perceivers are presumably more inclined to think of the other person as a relatively mindless object. The multidimensional nature of mind perception, though, makes a more

sophisticated prediction. Because bodies are associated with feeling, drawing attention to a person's body might make perceivers think the person has something closer to half a mind, one relatively capable of experiencing emotions or sensations but relatively incapable of thinking. A series of experiments confirmed this interesting prediction (Gray, Knobe, Sheskin, Bloom, & Feldman Barrett, 2011). Models, both men and women, whose upper bodies were shown semi-nude were rated as being relatively less thoughtful—less capable of planning or self-control—than the same models when only their faces were shown, consistent with traditional understanding of objectification. However, the models were also judged to be more capable of feeling—more capable of experiencing desire, hunger, and pleasure—when their bodies were shown compared to only their faces. Scantily clad models were indeed objectified, but they were treated as if they only had half of a mind rather than no mind at all.

Complementary results emerge in perceptions of agents who lack bodies, and hence attention is likely to be directed more at the agent's mind. God, for instance, was perceived by people in one survey to be extremely capable of thinking but incapable of feeling (Gray et al., 2007). God was perceived to be very knowledgeable, but not as an agent that gets hungry, feels pain, or experiences pleasure as human beings do. Similarly, corporations may be legally defined to be "persons" under current U.S. law, but they are perceived by most people to be only partly human: capable of reasoning, rationality, and sophisticated thinking but incapable of feeling emotions like empathy, remorse, or regret (Rai & Diermeier, 2015).

Understanding the activation of mind perception processes helps to explain the extent to which other agents are perceived to have a mind, and what kind of mind they are presumed to possess. Anthropomorphism and dehumanization may seem like fundamentally different phenomena, but they actually appear to be guided by the same set of underlying psychological processes.

2.2 Connecting activation to accuracy

Identifying the factors that trigger mind perception is easier than determining the accuracy of these judgments. Accuracy is relatively straightforward at the extreme end of the spectrum from completely mindless agents to obviously mindful agents. Attributing mental capacities to agents that obviously lack them, such as in some cases of anthropomorphism, constitutes one type of mistake. Your computer is not intentionally trying to sabotage your

productivity when it crashes unexpectedly, even if the thought routinely occurs to you. And a "company," no matter what court judges, politicians, or customers might intuit, is a collection of individuals that are capable of thinking but does not think on its own. When lifeless agents trigger mind perception processes, then people are likely to make a mistake by perceiving a mind where none exists. At the other extreme, failing to recognize what are presumably universal human mental capacities in other people, such as in cases of dehumanization, constitutes a second type of mistake. Believing that an outgroup member is relatively incapable of experiencing remorse (Wohl, Hornsey, & Bennett, 2012), for instance, would likely represent a significant underestimation of another person's emotional capacity. When mindful human beings fail to trigger mind perception processes, then people are likely to make a mistake by failing to recognize a mind right before their eyes.

In between these extreme cases, however, is a wide array of minds whose capacities are ambiguous and where accuracy is more difficult to identify. When your dog gives you a guilty look, is he or she actually feeling remorse? Apparently not, according to at least one experiment (Horowitz, 2009), but one experiment hardly qualifies as a rigorous test of mind perception accuracy. Measuring accuracy requires comparing a person's beliefs about an agent's mental capacities against a corresponding measure of them. This is rarely done in experiments examining anthropomorphism and dehumanization. Given the difficulty in identifying conclusive measures of mental capacities (i.e., the extent to which an agent has a mind) to compare predictions against, there will likely never be a clear answer to whether people attribute too much or too little mind to others across the entire spectrum of agents evaluated in everyday life. People seem to do both, depending on the context. Understanding the triggers that activate mind perception processes helps to explain the nature of these occasionally clear mistakes, but more generally can explain the kinds of minds people are likely to perceive in other agents.
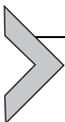
3. What state is another mind in? Applying mind perception

Once mind perception processes are activated and a person is actively trying to understand the mind of another person, how accurately do they do so? Accuracy rates are often better than chance, but far from perfect, with systematic accuracy and error in mental state inferences that can be explained

by at least three basic processes that guide these inferences: egocentrism, stereotyping, and behavioral inference. Understanding how these processes explain patterns of accuracy and error first requires an accurate understanding of how well people actually make these inferences.

3.1 Accurately characterizing accuracy

Accuracy can be difficult to quantify in cases of anthropomorphism and dehumanization because it can be difficult to identify an appropriate measure of the mental capacities in question, but identifying the accuracy of mental state inferences about other people is considerably easier. Doing so first requires measuring one person's predictions of another's mental state, then getting an actual measure of the predicted mental state to serve as an accuracy criterion, and then comparing predictions against the criterion (Funder, 1995; Jussim, Crawford, & Rubinstein, 2015). Unlike behavior that can be objectively observed, measuring the accuracy of mental state inferences privileges self-reports of conscious mental experiences as the key criterion. Social psychologists know well the litany of challenges that arise with the accuracy of self-reports, especially with people's introspective reports of their own mental processes or with socially desirable responding (e.g., Nisbett & Wilson, 1977; Schwarz, 1999). Care is therefore taken in the best research to measure a criterion that targets can report relatively accurately (e.g., mental contents—*what* a person is feeling or thinking rather than *why* is the person thinking or feeling that way), and assuring that predictions are made on the measures that accuracy is being assessed on.

Unfortunately for simplicity's sake, making any precise statement about where mental state inferences fall along the full accuracy continuum is impossible. As with any ability, performance is a function of the difficulty of the test and hence varies widely. Some tests are so easy as to qualify as child's play. In the standard "false belief test" (Baron-Cohen, Leslie, & Frith, 1985; Winner & Perner, 1983), Sally places a desirable object, like chocolate, in a box and her sister, Anne, moves the object to the cupboard while Sally is out of the room. Where will Sally look for the object when she comes back? Children younger than 4 tend to make an egocentric mistake by assuming that Sally will look where the child knows the object is hidden instead of where Sally last left it and would therefore presume it to be. Adults almost never make this mistake. But make the task just a little more difficult by presenting adults with four different containers (instead of two) and asking them to indicate the likelihood that Sally will look in each container,

and now glimmers of a child-like egocentric error begin to emerge. Adults now believe there is a nonzero probability that Sally will look in the container that the object was moved to without her knowledge (Birch & Bloom, 2007). Increase the difficulty in this task just a little more by inducing a negative mood that makes adults more myopic in their reasoning, and the egocentric error is larger compared to when adults are in a positive mood (Converse, Lin, Keysar, & Epley, 2008).

Everyday life provides dramatically more difficult mind reading problems than even the trickiest version of the standard false belief task. Professors wonder whether their students find them to be interesting, entertaining, and engaging. Parents wonder whether their children feel safe and happy. And people wonder whether their partner really loves them or not, is being faithful to them or not, or wants *this* gift or *that* gift as a birthday present. To get a sense of the typical magnitude of accuracy observed in psychological research, consider people's ability to predict others' impressions of them. One common procedure involves having individual members in a group predict how they will be rated by other members of the group on different traits, such as intelligence, trustworthiness, conscientiousness, or leadership ability. Other group members then actually rate the target on these same traits. Targets' predictions are then compared against others' actual ratings either by calculating a correlation or by calculating the absolute difference between predicted and actual ratings. One analysis of a series of experiments all utilizing this same design showed a typical pattern of results (Kenny, 1994). When accuracy was calculated by comparing a target's predictions against the average of other group members' judgments, a fairly "easy" test of accuracy because averaging observers' judgments eliminates idiosyncratic impressions from targets, then judgment accuracy was fairly high. The average correlation across six experiments on this measure of "generalized accuracy" was 0.51. People can have a reasonable sense of how they are judged by others, in general. But when the difficulty of the judgment itself was increased, by measuring how well people could predict how each individual observer rated them, then accuracy dropped dramatically. On this measure of "dyadic" accuracy, the average correlation between predicted and actual ratings across observers was only 0.13. Similar results emerged in judgments of how much one was liked by others, where the generalized accuracy was 0.47 and the dyadic accuracy correlation was 0.18. As Kenny (1994, p. 159) summarized, "People seem to have just a tiny glimmer of insight into how they are uniquely viewed by particular people."

As another simple example of a common everyday mindreading test, consider an experiment we conducted in which one person was asked to predict how attractive he or she would be rated by two members of the opposite sex based on a photograph (Eyal & Epley, 2010). College under-graduates participated in this experiment, presumably among the people most familiar with thinking about how attractive others would find them to be, and who had also received some feedback for better or worse over the course of their lives on this particular dimension. The correlation between predicted ratings of attractiveness and actual attractiveness was pos-itive (0.23) in one experiment and negative (−0.24) in the other, but neither differed significantly from a correlation of zero that would be expected by chance. Of course, this experiment does not indicate that people are clueless about how attractive others find them to be, but only that this particular task proved to be quite difficult for reasons we will explain later.

Other tests find similarly modest accuracy rates. In the "empathic accuracy paradigm" (Ickes, 2003), two people separately go back through a videotaped conversation, with one reporting their thoughts and feelings at specific moments in time and the other guessing the target's thoughts and feelings. Researchers can then calculate the percentage of time that one person's predicted thoughts and feelings accurately describe the other person's actual thoughts and feelings. In one representative study (Stinson & Ickes, 1992), male strangers rated each other with an average accuracy rate of 20%. Male friends performed better, but still only achieved an accuracy rate of approximately 30%. Summarizing the broader research literature, Rollings, Cuperman, and Ickes (2011, p. 147) note that, "Although friends demonstrate an enhanced ability to infer each others' thoughts and feelings, they still perform this task well below the theoretically possible limit…" Experimental tests of lie detection in which participants view a series of videos of other people telling either a truth or a lie find that people are able to accurately distinguish truths from lies 54% of the time, an average figure better than chance at 50% but also notably worse than perfection (Bond & DePaulo, 2006). Typically, when researchers write that people are "accurate" in their judgments of others' minds, what they mean is statistically better than random guessing rather than close to perfect (for reviews see Epley, 2014; Rollings et al., 2011; Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015; West & Kenny, 2011).

Any accuracy correlation can only tell you how people perform on a given task compared to some standard, and the results just mentioned so far simply show that mind reading tasks can be challenging. Perhaps a better

comparison for understanding the consequences of everyday mind reading is people's own confidence in the accuracy of their judgment. Beliefs held with confidence are more likely to be acted on than beliefs held in doubt. Confidence in judgment tends to be driven by the ease with which a judgment can be made, whereas accuracy is determined by the validity of one's knowledge, meaning that confidence and accuracy tend to be only weakly positively correlated with each other. When answering general knowledge questions, for instance, people tend to be underconfident on items that feel subjectively difficult but overconfident on items that feel subjectively easy (Kruger & Dunning, 1999; Moore & Small, 2007). Because inferences about others' minds are often subjectively easy to make, coming relatively quickly and easily to mind, overconfidence in mind reading would seem to be a general rule, especially when judging familiar others.

In the control condition of one experiment we conducted with married and dating couples (Eyal, Steffel, & Epley, 2018, Experiment 25), one person predicted how his or her partner would respond to a series of 20 consumer preference questions. Although these predictors guessed their partners' responses exactly right at significantly better than chance levels (an average of 4.9 when chance was 2.8), predictors also dramatically overestimated their accuracy, believing that they had predicted 12.6 exactly correctly. These results replicate a series of experiments by Swann and Gill (1997), who asked one member of a married couple to predict how his or her spouse would respond on surveys measuring self-worth, self-efficacy, and activity preferences. Spouses again predicted their partners' responses at significantly better-than-chance levels, but their confidence far exceeded their actual accuracy. When predicting their partner's feelings of self-worth, for instance, spouses predicted 44% of the items correctly when chance was 20%, but they believed they had predicted 82% of the items correctly. Spouses' confidence was correlated with the length of their relationship, but relationship length was not meaningfully correlated with accuracy.

Similar above-chance accuracy along with overconfidence emerges in tests of "thin-slice" judgments (i.e., inferences drawn from short excerpts of behavior; Ames, Kammrath, Suppes, & Bolger, 2010), in lie detection (DePaulo, Charlton, Chooper, Lindsay, & Muhlenbruck, 1997; Swann, Silvera, & Proske, 1995), and in evaluations of others' intentions in communication (Kruger, Epley, Parker, & Ng, 2005). In one experiment we conducted (Kruger et al., 2005, Experiment 3), communicators attempted to convey one of four emotions to either a friend or a stranger through a sentence they created either by email, voice, or face-to-face.
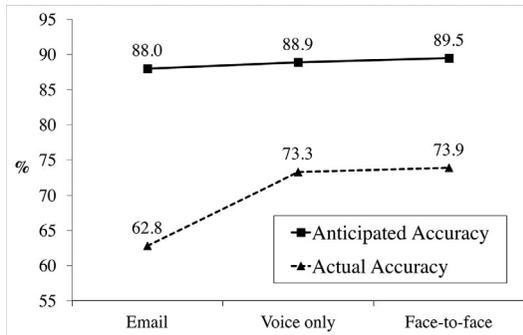
Fig. 2 The percentage of emotions communicators anticipated conveying correctly compared to the actual percentage identified correctly in email, voice only, and face-to-face conditions (Kruger et al., 2005).

Each communicator created five sentences, each conveying a different emotion. They then predicted judges' accuracy in identifying their communicated emotions. As can be seen in Fig. 2, judges were more likely to accurately identify the communicator's emotion when using his or her voice—voice or face-to-face conditions—compared to email (text only). Communicators (i.e., targets) themselves were completely unaware of this difference, overestimating the percentage of times they communicated their emotion accurately in all conditions, but especially when communicating over email. Communicators were also more overconfident when communicating with friends than with strangers (see also Savitsky, Keysar, Epley, Carter, & Swanson, 2011). Not all mind perception tasks yield such overconfidence, of course, perhaps especially when judging unknown strangers, in which case underconfidence may actually be observed (Eyal et al., 2018). At the very least, the existing literature suggests that people are not especially aware of how well they can understand the minds of others, and may overestimate their ability to understand the minds of those they are presumed to know best.

Mind perception accuracy is typically better than chance, considerably worse than perfect, and often not as accurate as people themselves expect it to be. This mix of accuracy, error, and miscalibrated confidence is not random but systematic, meaning that variance in the accuracy rates just discussed should be explainable by the processes that guide judgment. Because others' minds are so complex, no single mechanism explains all mental state inferences. Instead, three basic mechanisms have been identified egocentrism, stereotyping, and behavioral inference.

3.2 Egocentrism

The most obvious place to start when trying to understand the mind of another person is to consult your own. If a room feels hot to you, then it's reasonable to assume that others will also feel hot because others generally have sensory organs that operate similarly. If a policy proposal seems ludicrous to you, then it is reasonable to assume that others will think similarly because most people follow similar rules of reasoning and rationality (Keysar, Ginzel, & Bazerman, 1995). If you know nothing else about another person, then one's own experience is a completely reasonable, even rational, starting point for another's experience (Dawes, 1999). As you know more about other people, one's own perspective may seem like a less reasonable starting point. If a room feels hot to you because you're still wearing your winter coat indoors, then it is clearly unreasonable to assume that others feel that the room is as hot as you do.

The challenge for most fully-developed adults is not in recognizing that others' mental states might vary from one's own, but rather in determining how, when, and why they differ (Van Boven, Loewenstein, Dunning, & Nordgren, 2013). This challenge is partly structural. Despite occasional claims about out-of-body experiences, people's perceptions are inherently perspective bound. A person sees, hears, and learns about the world from his or her unique perspective on that world, and hence one's own perspective comes automatically to mind in order to interpret one's sensory experience. Others' potentially differing perspectives, in contrast, must be effortfully inferred and so likely come to mind only subsequently. As discussed earlier, adults become better than children at subsequently correcting an automatic egocentric interpretation of the world to recognize another's obviously differing viewpoint, but they do not outgrow the initial egocentric interpretation altogether. In this way, one's own perspective can act as an initial anchor in judgment, from which people subsequently adjust to accommodate differences between themselves and others.

This adjustment process requires awareness that one's own perspective is potentially unique, effortful cognition to deliberately correct an intuitive assessment, and time to render a deliberate judgment. Anything that reduces awareness of one's unique perspective, cognitive resources, or time to enact the adjustment process will produce systematic egocentric biases in evaluations of others' mental states. In addition, because adjustment processes tend to terminate as soon as one reaches a plausible value (Epley & Gilovich, 2006; Mussweiler & Strack, 2001; Quattrone, 1982), estimates tend to be biased on the side of the range consistent with the initial anchor, thereby yielding an egocentric bias in mental state inferences.

Several experiments we have conducted support this egocentric adjust–
ment account (Epley, Keysar, Van Boven, & Gilovich, 2004). For example,
in one study that tested the impact of time pressure on judgment
(Experiment 2, Epley, Keysar, et al., 2004; Epley, Morewedge, et al.,
2004), participants listened to ostensible answering machine messages left
on a friend's phone (e.g., about a comedian being hilarious) after reading
some background information that was either positive (e.g., the target loves
this comedian), and therefore made the messages seem sincere, or negative
(the target hates this comedian), and therefore made the message seem sar-
castic. Although the meaning of each message was crystal clear to the par-
ticipant, the friend listening to the message did not know the background
information and so it was obvious that the friend's interpretation would
be somewhat less clear. An egocentric bias in this case would be presuming
that the friend would interpret the message consistent with the participant's
own view based on the private background information. As can be seen
in Fig. 3, participants showed stronger egocentric biases in this experiment
when asked to hurry than when allowed to respond at their leisure,
suggesting that time pressure thwarted deliberate adjustment from an ego-
centric anchor (see also Horton & Keysar, 1996).

In another experiment, the time needed to render a judgment about
another person's beliefs was linearly related to the perceived difference
between the self and other, suggesting that participants were taking more
time adjusting an egocentric anchor to estimate the beliefs of increasingly
more distant targets (Tamir & Mitchell, 2013). Neuroimaging also reveals
that activity in the medial prefrontal cortex, a particularly active region when
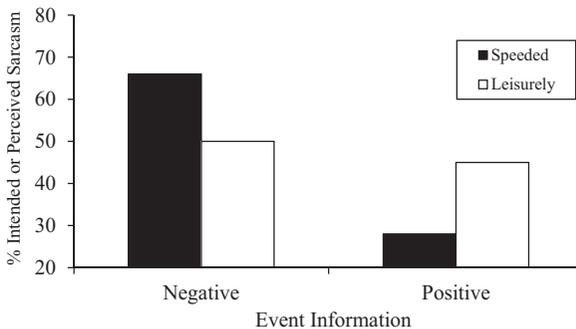
Fig. 3 Percentage of hurried and leisurely participants who expect a sarcastic interpre-
tation after receiving positive or negative event information. Participants showed a
stronger egocentric bias when were hurried than when responding leisurely (Epley,
Keysar, et al., 2004).

making self versus other judgments, is linearly related to the perceived discrepancy between one's own and another person's beliefs (Tamir & Mitchell, 2010). Finally, increasing the motivation to engage in an effortful adjustment process can diminish egocentric biases in judgment (Experiment 3, Epley, Keysar, et al., 2004; Epley, Morewedge, et al., 2004). In this experiment, participants tasted a sample of what they knew to be either Coke or Pepsi—two colas that are surprisingly difficult to identify when you do not already know their identity—and then predicted the percentage of their peers who would correctly identify the cola's identity. Those offered a financial incentive for estimating the percentage accurately estimated that fewer peers would identify the colas correctly, consistent with a weaker egocentric bias, suggesting that increasing participants' willingness to engage in effortful thought reduced egocentric biases.

Whether due to a lack of awareness that one's own perspective is unique and needs to be adjusted, or due to insufficient adjustment, the egocentric biases produced in mental state inferences come in at least two subtly different varieties. One comes from a difference in attention. If two people are attending to different stimuli or information, then their judgments are likely to differ. These attentional biases come in many different manifestations. For instance, people tend to be more aware of themselves—their own behaviors, appearance, or mere presence—than others are. This heightened attention to oneself can lead people to overestimate how much others are also noticing or paying attention to them, a phenomenon known as the Spotlight Effect (Gilovich, Kruger, & Medvec, 2002; Gilovich, Medvec, & Savitsky, 2000). Threats to one's self-image also capture a person's own attention more than they capture others' attention, a difference that can leave people overestimating how harshly they will be judged by others when they commit an embarrassing blunder or mishap (Epley, Savitsky, & Gilovich, 2002; Savitsky, Epley, & Gilovich, 2001). People also tend to know more about themselves than others do, and use this privileged knowledge when inferring others' impressions of them (Chambers, Epley, Savitsky, & Windschitl, 2008). This can lead people to overestimate how transparent their own private mental states, including intentions, emotions, and attitudes, are to others (Gilovich, Savitsky, & Medvec, 1998; Keysar, 1994; Keysar, Barr, & Horton, 1998). In social exchanges, a person who does a favor for another is likely to be highly attentive to the cost incurred to provide a favor, whereas the recipient is likely to be attentive to the benefit received from the favor (Zhang & Epley, 2009). This can lead favor-givers to overestimate how appreciative recipients will be in response to a

high-cost/low-benefit favor. Favor-givers are more likely to underesti-mate, however, how appreciative a recipient will be following a low-cost/high-benefit favor.

   Reducing egocentric biases produced by differences in attention requires shifting attention so that two people are attending to the same information. Those doing a favor for another person are likely to be more calibrated when anticipating the recipient's reaction when they are encouraged to consider the benefit received by the recipient, the very information that is primarily guiding the recipient's reaction (Zhang & Epley, 2009). And a person who just committed an embarrassing blunder will be more accurate predicting how they will be judged by others if their attention is explicitly drawn to other events besides the blunder that would also influence an observer's evaluation (Savitsky et al., 2001). In one of our experiments, a target was introduced to an observer through a short biography that happened to reveal two embarrassing details from the target's past. The biography varied in length, with one being short and revealing little beyond the two embarrassing details, whereas the other was considerably longer and included more flattering facts about the participant. As can be seen in Fig. 4, the observers who received the short biography judged the targets more negatively than those who received the long biography. Targets who were introduced were
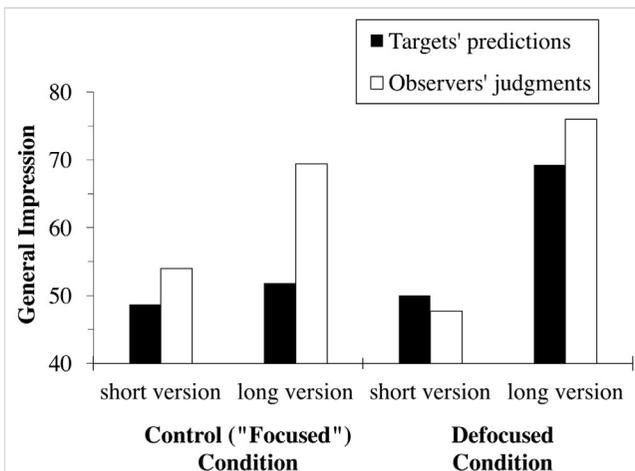
Fig. 4 Targets' predictions of how they would be judged following an embarrassing revelation in an introduction by observers who read a short or long version of the intro-duction. Targets recognized they would be judged more favorably in the long version only in the "defocused" condition where they were asked to consider all of the elements in the introduction that would influence an observer's evaluation (Savitsky et al., 2001).

more calibrated when predicting how they would be judged when they were explicitly led, just before predicting their observer's evaluation, to consider all of the detail in the introduction that the observer would consider when forming an impression of him or her.

The second variety of egocentric biases come from differences in construal. When two people are attending to the very same stimulus but are construing (or interpreting) it differently, then two people will view what might appear to be the same stimulus quite differently. An American citizen viewing an image of the September 11th terrorist attacks on the World Trade Towers in New York is going to feel very different than an Islamic Jihadist viewing the exact same image. If they lack awareness of how someone else might interpret the same event differently, then people are likely to use their own mental experience as a guide to another's. Partisans in a simulated legal dispute, for instance, came to very different self-centered conclusions about the fair outcome of a trial even though both sides had the very same information to attend to (Babcock, Loewenstein, Issacharoff, & Camerer, 1995). More telling, these partisans also assumed that the judge's evaluation would be similar to their own. These differences in construal are the hallmark of many "empathy gaps" in which one person's emotional experience is simply not appreciated by others. Those who are not feeling pain think a potential torture procedure is likely to feel less painful to a victim than those who are currently in the midst of feeling some pain (Nordgren, Morris McDonnell, & Loewenstein, 2011). Those who are dulled to the humor in a joke because they have listened to it multiple times are likely to underestimate how funny others will find it to be when listening to it for the first time (Campbell, O'Brien, Van Boven, Schwarz, & Ubel, 2014). And those who are only *imagining* a potentially embarrassing public performance underestimate how much anxiety they would feel compared to those who are *actually* about to engage in the performance (Van Boven, Loewenstein, & Dunning, 2005).

Reducing egocentric biases produced by differences in construal requires providing people the same belief, attitude, emotion, or experience as a target such that they are interpreting or experiencing the same stimulus similarly. Experiencing the exact same pain as another person enables more accurate prediction of that person's experience (Nordgren, Banas, & MacDonald, 2011; Nordgren, Morris McDonnell, et al., 2011). Interpreting a photograph of yourself using the same level of attention to detail as an observer does will increase the ability to predict another's impression of you (Eyal & Epley, 2010). Altering construal is arguably more challenging than

altering momentary attention, because construal differences are often produced by longstanding beliefs, knowledge, attitudes, or differences in actual experience that cannot be easily altered. An expert can never be a novice again. A child cannot quickly share the perspective of a parent. A partisan in a dispute cannot simply alter his or her construal of a contentious issue. Some egocentric biases are simply more resistant to change than others.

When two people are attending to the same information, and interpreting what they are attending to in the same way, then egocentric projection offers a very accurate guide to the mind of another person. Egocentric projection produces errors in judgment only when two people's perceptions diverge in a way that is insufficiently appreciated. When a target is highly similar to oneself, then egocentric projection is potentially the most accurate strategy for understanding the mind of that other person and reducing egocentrism would diminish accuracy. In one experiment demonstrating this possibility, married couples predicted their partners' consumer preferences (Hoch, 1987). Spouses would have been most accurate predicting their partner's preferences if they had completely projected their own preferences. The adjustments people made to distinguish their partner's preferences from their own actually reduced accuracy, compared to pure egocentric projection. People seem to have at least some sense of this, as people rely on egocentric projection less when predicting the preferences of another person who is perceived to differ from the self (Krueger, 2007). People are more egocentric, for instance, when understanding the minds of ingroup members than outgroup members (Ames, 2004a, 2004b; Cho & Knowles, 2013; Clement & Krueger, 2002), of friends than enemies (Machunsky, Toma, Yzerbyt, & Corneille, 2014), and of cooperators than competitors (Toma, Yzerbyt, & Corneille, 2010). These similarity-based moderators would yield relatively more or less accuracy in judgment to the extent that the attributes that yield perceived similarity align with actual similarity in mental states. This is not always the case. In one experiment, people assumed that a close friend would be better able to understand the hidden intention they were communicating in a spoken message than a stranger would. In fact, there was no difference between the two (Savitsky et al., 2011). In another experiment, participants standing at a freezing cold bus stop (compared to in a lab) assumed that hikers who were lost in the woods would care more about staying warm than eating, consistent with their own egocentric experience (O'Brien & Ellsworth, 2012). Participants did this, however, only if the hikers shared their political affiliation, apparently assuming that different

political views also yielded different biological needs, a questionable assumption even in the most politically polarized of times. People may moderate the use of egocentrism as a guide to the minds of others in a way that corresponds with reality, but far from perfectly so.

3.3 Stereotyping

If people rely less on egocentric projection when judging the minds of dissimilar targets, then what inferential tool do they rely on instead? Recognizing that another person's mind is likely to differ from one's own requires having some existing knowledge about the other person, such as the groups or categories a person belongs to. Others are men or women, doctors or lawyers, bosses or employees, rich or poor, conservative or liberal, among a seemingly endless number of social categories. Existing knowledge about these categories can provide a rich source of information about another person's mental states in the form of stereotypes, defined simply as "beliefs about the characteristics of groups" (Ashmore & Del Boca, 1981; Jussim et al., 2015). Stereotypes are formed through complex processes of direct observation, others' reports, and cultural knowledge transmitted through socialization, which can then be used as a guide to attitudes, beliefs, or other mental states. Stereotypes can be used to estimate what the typical group member might think or feel if nothing else is known about an individual, or to estimate what a specific individual within a group might think or feel in the absence of further individuating information about the person (Kunda & Thagard, 1996).

To see the flexible use of egocentrism and stereotyping in mental state inferences, consider a seminal series of experiments by Ames (2004a). In one experiment, participants were asked to predict the thoughts and feelings of an individual fraternity member, lawyer, or medical student. The target's preferences were described to participants as being either relatively similar to them or quite different from them. Participants predicted the target's thoughts and feelings in each scenario. To test the strength of egocentric projection, participants reported what their own thoughts and feelings would be in each scenario, which was later correlated with their prediction of the target's thoughts and feelings. To test the strength of stereotyping, participants also reported what the typical fraternity member, lawyer, and medical student would think and feel in each relevant scenario, which was later correlated with their prediction of the target's thoughts and feelings. Results indicated that participants were more likely to use themselves as

a guide when predicting the thoughts and feelings of a target described as being similar to the self, but were more likely to rely on the relevant stereotype for each target when he or she was described as being different from the self. In another experiment (Ames, 2004a), MBA students used their own presumed thoughts and feelings to predict those of another MBA student, but relied more heavily on relevant group stereotypes when predicting the thoughts and feelings of a law-school student. In a third experiment (Ames, 2004b), university students predicted movie preferences for high school boys or girls after either thinking of ways in which they are similar or different from a high schooler. Results indicated a greater reliance on one's own movie preferences to predict a high schooler's preference after thinking about similarities, but a greater reliance on gender stereotypes regarding movie preferences after thinking about differences. In these experiments, the degree of egocentrism and stereotyping was inversely related across targets, suggesting that participants relied more heavily on either one source of information or another when inferring the target's mental experience.

More recent research has identified the flexible use of egocentrism and stereotyping even when judging different attributes of the same person based on known differences between the self and a target (Van Boven, Judd, & Sherman, 2012). Extreme political partisans, for instance, know that their own political attitudes differ from those on the opposite side of the political spectrum, and so do not project the content of their own attitudes onto those dissimilar others, but instead rely on stereotypes about the opposing side's attitudes. However, extreme partisans did project attitudinal *processes* onto partisans on the opposite side of the political spectrum, assuming that others' emotional reactions were as intense and extreme as their own. Hence, more extreme partisans perceived more polarization in the intensity of people's beliefs than those with less partisan belief. Mental state inferences are directed at specific mental states of a given target, and hence may require different tools to make inferences about different aspects of another's mind.

As with egocentrism, stereotyping can increase the accuracy of mental state inferences to the extent that the stereotypes themselves are based on accurate information about a group's characteristics, and applied to either a group average or an individual appropriately. Theoretically, human judges could be nearly perfect at judging the *average* characteristics of a group as long as they were based on direct, unfiltered, and complete observations of those characteristics. This theoretical potential can be seen in an experiment in which participants were shown an image containing a set of circles of varying

sizes (Ariely, 2001). In a subsequent testing phase, participants were shown a single circle and asked to indicate whether or not it was presented in the preceding set. Results indicated that participants' judgments of individual circles were very inaccurate, generally unable to tell whether a given circle was present in the preceding set at greater than chance levels. However, participants tended to make a reliable mistake that highlighted more sophisticated processing of the circles. In particular, participants tended to guess that a circle that was the *average* size of the circles in the preceding set was present in the set. These results suggest that the human brain may automatically derive statistical properties from groups that reflect reality with a surprisingly high degree of accuracy. Other research finds similar results in judgments of emotions from faces, where perceptions of a group's emotional experience reflects the average emotion shown in a group of faces (Haberman, Harp, & Whitney, 2009; Haberman & Whitney, 2007, 2009), and also in judgments of sounds, where listeners were generally able to identify the average frequency of a set of pure tones (Piazza, Sweeny, Wessel, Silver, & Whitney, 2013). People even seem to disregard anomalies, such as an outlier, when calculating a group average just as a statistician might in order to get a better estimate of a group's central tendency (De Gardelle & Summerfield, 2011). If a stereotype represents a person's belief about the average characteristics of a group of people, then people seem capable of representing that average exceptionally well if the inputs into it are perfectly clear.

The problem for a stereotype's accuracy in everyday life is that the information obtained about other human beings is rarely perfectly clear. It is almost never direct, unfiltered, or complete. As Lippmann (1922, p. 53) noted when first using the term "stereotype" to describe imperfect social judgment, "inevitably, our opinions cover bigger space, a longer reach of time, a greater number of things than we can observe directly. They have, therefore, to be pieced together out of what others have reported and what we can imagine." Stereotypes about human beings are inherently more complex and based on less accurate information than the highly stylized perception experiments just described. No individual is exposed to the attitudes of all members of one political party, for instance, or learns how all members of one racial category feel about anything. Nevertheless, research testing the accuracy of stereotypes to predict group characteristics, including mental states such as attitudes or emotional experiences, often finds robust evidence of accuracy when predicting group averages, suggesting that a reasonable amount of accurate insight is still contained in these abstract representations

(Jussim, 2012). In one meta-analysis of over 50 studies assessing accuracy based on demographic characteristics like race, gender, and age, 45% yielded a correlation between predicted average group characteristics and actual group characteristics of 0.5 or larger (Jussim, Crawford, Anglin, Stevens, & Duarte, 2016). Variance in these accuracy rates seems to depend on the degree of direct exposure to members of the groups being predicted, although this has not been systematically tested. Stereotypes about majority groups, for instance, tend to yield more accuracy than stereotypes about minority groups (Jussim, 2012). Stereotypes about demographic character-istics that people have considerable exposure to, such as gender and age (Chan et al., 2012), tend to be more accurate than stereotypes based on race (or personality judgments based on nationality; Terracciano et al., 2005; McCrae et al., 2013), where direct exposure to valid information is more limited (Jussim et al., 2016). Unfortunately, these studies do not vary the targets of stereotypes in any systematic fashion, making the connection between observed accuracy rates and the mechanisms that produce stereo-types largely speculative.

Although stereotypes may provide better-than-chance insight into the minds of others, especially the minds of "average" others, they may also yield predictable errors. Understanding the processes that create stereotypes can help to predict the imperfections produced in mental state inferences. For instance, social psychologists have long presumed that stereotypes consis-tently exaggerate the differences between groups, but empirical evidence for such exaggeration is highly inconsistent. Some research finds exaggera-tion but other research does not. As Jussim (2012, p. 392) summarizes, "Exaggeration does sometimes occur, but it does not appear to occur much more frequently than accuracy or underestimation, and may even occur less frequently." Not all attributes of a given group, however, are equally relevant to a given stereotype. Groups tend to be defined by the attributes that make them distinct from each other (Judd & Park, 1993), just as the "self" is defined by the attributes that make one person distinct from another person (McGuire & McGuire, 1988; Mussweiler, 2003; Nelson & Miller, 1995). The attributes that come to mind when you think of "men" and "women" are not features that make men and women the same—breathing air, possessing a heart, or walking on two legs—but rather features that make men and women presumably distinct from each other—such as differences in interdependence or sexual preferences. If there is an imperfect correlation between beliefs about group characteristics and actual group characteristics, then the largest presumed differences will be matched with less extreme

actual differences by statistical necessity, yielding a textbook example of regression-to-the-mean. The defining attributes of a given group stereotype would tend to be overly extreme, exaggerating the differences between groups. Less central or accessible attributes of a stereotype, however, should not be presumed to differ and hence should not show systematic evidence of exaggeration.

We found evidence consistent with this hypothesis in a series of experiments examining one of the stereotypes typically found to yield the highest accuracy rates in both mental state and trait inferences: gender stereotypes (Eyal & Epley, 2017). In these experiments, mind reading abilities such as interpersonal sensitivity, empathy, and compassion were perceived by participants to differ the most between men and women, and were also the attributes that came most readily to mind when thinking about "men" and "women." In contrast, attributes like impulsiveness and happiness were not perceived to differ, and did not come immediately to mind when thinking about men and women. In experiments examining the presumed versus actual gender differences on these attributes, gender stereotypes were sometimes directionally accurate, such that women performed a little better on a variety of mind reading tests than men (the typical reported effect size in the literature is around 0.2; Hall, Gunnery, & Horgan, 2016), but people tended to dramatically exaggerate these gender differences, assuming these differences were typically two times larger (or more) than they actually were. No consistent evidence of exaggeration emerged for happiness, an attribute that is not a defining feature of gender stereotypes.

Like egocentrism, relying on stereotypes yields some systematic accuracy in judgment as well as some systematic error. Human judges seem exceptionally capable of identifying statistical properties in distributions of individuals, as long as the information they have at their disposal perfectly represents the group. Stereotypes of people rarely provide perfect information, as stereotypes are based not simply on direct observation but also on third-person observations, as well as potentially mistaken inferences about behavior that is not observed. The processes that generate stereotypes can therefore help to predict variance in accuracy rates when little other than category membership is known about another person.

3.4 Behavioral inference

The tools of egocentrism and stereotyping enable mental state inferences in a wide range of contexts when little or nothing is known about another target,

and even when the target is not physically present. But mental state infer-
ences are also made when considerably more about another person is
known, such as in an ongoing social interaction where another's behavior
can be observed directly. A person's behavior can then serve a powerful
source of information by working backward from the behavior observed
to the inferred mental states that caused the behavior. Everything from
choices to nonverbal expressions to spoken language is scrutinized to
ascertain intentions, desires, beliefs, and ultimately another person's stable
dispositions and personality.

Decades of research in social and cognitive psychology has identified
the sophisticated process people go through to infer personal attributes from
observed behavior, including mental states (Epley & Waytz, 2010; Gilbert,
1998; Heider, 1958; Jones, 1979). This information is so influential that the
other inferential tools of egocentric projection and stereotyping are quickly
set aside when personal behavioral cues are present. In one well-known
experiment, for instance, white participants watching a white or a black
person being interviewed showed evidence of making stereotypic inferences
after watching the interview for 15 s, but showed no evidence of stereotypic
inferences after watching the video for 12 min (Kunda, Davies, Adams, &
Spencer, 2002). The more individuating behavioral evidence a person
has to rely on, the less people rely on more indirect tools of mental state
inference as a guide.

Using behavior as a cue to mental states makes perfectly rational sense,
because there is often a close correspondence between mental states and
actions, either because cognitive activity causes action, because people infer
their own mental states from their observed behavior (Bem, 1972), or
because a highly correlated neural mechanism causes both behavior and
corresponding cognitive activity (Wegner, 2002). Developing a theory of
mind as one ages involves learning the sophisticated correspondence
between mind and behavior so that the latter serves as a reliable inferential
cue to the former. Of primary importance in behavioral inference is devel-
oping an understanding of intentionality. A person who harms you on
purpose is operating with a very different set of desires, beliefs, or personal
dispositions than a person who harms you by accident. Recognizing
intentions in others is among the first mental state inferences to develop
in children, emerging before 18 months of age, followed by a recognition
of desires and preferences, beliefs (including false beliefs), and stable traits
and dispositions (Saxe, Carey, & Kanwisher, 2004; Woodward, 1998). This
same hierarchy seems to characterize the process of mental state inferences in

adults as well, with people being faster and more likely to make inferences about others' intentions than about others' desires and preferences, which in turn are made faster and more reliably than inferences about others' beliefs, which in turn are made faster and more reliably than inferences about others' stable personality traits (Malle & Holbrook, 2012).

More important for accuracy than the speed with which people leap from actions to intentions is the simplicity with which they do so. Although there is a complicated relation between actions and underlying intentions, mental states inferences tend to assume an overly simple correspondence between the two. People are generally presumed to say what they believe, choose what they want, and act as they please, with observers only subsequently correcting these automatic correspondent inferences when it is presumed necessary (Gilbert & Malone, 1995). This "correspondence bias" can lead to mistaken inferences, however, when the link between behavior and mental states or capacities is more complicated. A person who reads politically conservative answers to questions from a script has told you nothing about his or her political attitudes, and yet observers nevertheless infer that a person instructed to give conservative responses has more conservative beliefs than a person instructed to read liberal responses (Gilbert & Jones, 1986). A person who votes for a political candidate is presumed to like the candidate, even if the vote is actually driven by dislike of the opposing candidate (Miller & Nelson, 2002). And a person randomly given a chance to ask challenging general knowledge questions, such as the host of game show, is perceived to be more thoughtful and knowledgeable by observers than a person who is randomly assigned to answer those challenging questions, even though behavior is dictated almost entirely by the roles the people were randomly assigned to (Ross, Amabile, & Steinmetz, 1977). Actors who experience being "typecast" are well familiar with the mistaken consequences of the correspondence bias. Even when you know an actor is reading from a script, it is hard not to infer that they believe, feel, think, and want what they are instructed to say.

The strength of these correspondent inferences is moderated somewhat by people's sensitivity to the power of a person's situational context to create a more complicated relation between their minds and their actions. People living in interdependent cultures, for instance, seem somewhat less likely to infer that a person's attitudes correspond to observed behavior (Choi & Nisbett, 1998). And religious traditions, like Protestantism, that focus more on the correspondence between belief and behavior tend to show stronger evidence of the correspondence bias (Li et al., 2012).

Overall, the correspondence bias can produce error in mental state inferences because it presumes a more simplistic relation between behavior and minds than actually exists (Epley, 2014).

If people tend to infer mental states fairly directly from the behavioral cues they observe, then variability in the accuracy of mental state inferences can also come from the diagnosticity of the cues being observed. These cues can include both nonverbal behavioral cues, such as facial or bodily expressions, and verbal cues, including both the semantic content of language and the paralinguistic cues included in voice. A large literature attests to the speed and reliability with which people draw inferences from nonverbal behavioral cues, such as eye movements to infer truthfulness (DeSteno et al., 2012; Wesselmann, Cardoso, Slater, & Williams, 2012), facial appearance to infer trustworthiness or intellectual competence (Todorov et al., 2015), and facial expressions to infer emotional experience and intentions (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Ekman & Friesen, 1971). These evaluations tend to yield a high degree of consistency across judges even with very brief exposures (Bar, Neta, & Linz, 2006; Willis & Todorov, 2006), meaning that they can even predict decisions based on consensus at better than chance levels, including political elections (Todorov, Mandisodza, Goren, & Hall, 2005) and teaching evaluations (Ambady & Rosenthal, 1993). They do not, however, appear to provide an especially accurate sense of another's mind. In one experiment, people were unable to detect at better-than-chance levels whether a tennis player had just won or lost an important match based on evaluations of the face alone (Aviezer, Trope, & Todorov, 2012). In another experiment, participants were less accurate predicting a conversation partner's thoughts and feelings after talking in a lighted room compared to a dark room, suggesting that the ability to perceive bodily cues actually reduced accuracy compared to focusing on the voice alone (Kraus, 2017).

Indeed, direct tests of accuracy derived from verbal versus nonverbal cues consistently indicate that a person's mind is most clearly communicated through their voice (Hall & Schmid Mast, 2007; Ickes, 2003; Kruger et al., 2005; Mehrabian & Wiener, 1967). People are more accurate predicting another person's thoughts and feelings, for instance, when they listen to the two people interacting than when they simply watch two people interact (Zaki, Bolger, & Ochsner, 2009). Lies are more accurately detected over voice than in text alone, or when only perceiving body language (Bond & DePaulo, 2006). This is perhaps not surprising given that a person's voice is the tool human beings have evolved to communicate the contents

of their minds to others (Pinker & Bloom, 1990). Even paralinguistic cues in speech may signal mental activity in a relatively honest way that nonverbal behavioral cues cannot match. Pauses in speech, for instance, may reflect conscious thinking. A rising tone may reflect enthusiasm. Variance in pitch—intonation—may reflect the process of thinking as it's happening. Indeed, several experiments have found that other people seem more mindful—more capable of thinking, reasoning, and experiencing emotion—when perceivers hear what a person has to say compared to reading the very same semantic content. In one experiment we conducted, potential job candidates were perceived to be more thoughtful, rational, and employable when potential employers listened to the job candidate's "elevator pitch" compared to when they read a transcript of the same pitch or read the candidate's written pitch (Schroeder & Epley, 2015). In another, citizens who voted for an opposing political candidate were perceived to be more mindful—more thoughtful, reasonable, and rational—when people heard the voter explain his or her decision compared to when they read a transcript of the same content or read the citizen's written explanation of their vote (Schroeder, Kardas, & Epley, 2017).

In sum, another person's behavior can potentially provide an accurate window into his or her mind. Assuming a more simplistic relation between mind and behavior, and failing to differentiate relatively more versus less accurate behavioral cues to mental experience, can again help to explain both systematic accuracy and error in mental state inferences.
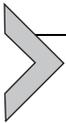
4. Increasing mind perception accuracy: Strategies and awareness of effectiveness

In the world of science fiction, budding wizards in the Harry Potter series learn to master the magical skill of Legilimency, enabling them direct access to the minds of others. In the real world devoid of magical powers, what can a person who wants to understand the mind of another person more accurately do?

The mechanisms that enable mind perception make it clear that multiple tools are used for interpersonal understanding, each of which provides both systematic accuracy and error depending on the context in which it is used. Egocentrism enables accurate insight into the minds of others to the extent that two minds share the same psychological perspective, but produces a predictable error of overestimating similarity when differences in one's own

and another's perspective are underappreciated. Stereotyping capitalizes on genuine similarity in the psychological experiences of people in the same categories or groups, enabling insight to the extent that an individual's mind matches the category's stereotype, but potentially exaggerating the differences between groups on their most defining features and missing important individual variability that deviates from the group's average. And a person's behavior may reflect their inner mind most clearly, but it does not do so as simply or directly as perceivers tend to assume. Like a carpenter who builds a house by learning when to use the right tool for a job rather than honing only one tool, accurate insight into the mind of another person is likely to come by flexibly using the right tool at the right time for the right target, instead of altering use of any one known inferential tool. Any increase in accuracy from relying more on one inferential tool is likely to be highly circumscribed, and offset by errors created by its ineffective use in other contexts. Moreover, people seem to have only a limited sense of when they are using an effective strategy for understanding the mind of another person and when they are not, meaning that there may be few cues available to perceivers that would trigger them to spontaneously adopt a more successful approach in the midst of a social interaction. Discouraging reliance on one inferential tool, or avoidance of a tool that sometimes creates error, should increase accuracy only to the extent that it encourages reliance on a more accurate tool.

Here we highlight the circumscribed nature of accuracy and the complicated consequences of trying to increase insight from one strategy alone by considering several common approaches focused on modifying egocentric inferences, stereotyping, or behavioral inference. None of these seem to systematically increase accuracy across the wide variety of contexts people encounter in their everyday lives. Instead, we suggest that the most consistently effective way to increase understanding is to avoid the problems that come from mental state inference by avoiding the need to make inferences altogether, using what we refer to as Perspective Getting.

4.1 Reducing egocentrism: Encouraging perspective taking

If relying on one's own perspective creates egocentric errors in judgment, then decreasing reliance on one's own perspective through perspective taking could presumably increase accurate insight. Perspective taking explicitly encourages people to shift focus from their own egocentric perspective to the other person's perspective, potentially increasing accuracy by attending

to information that might have otherwise been overlooked. Indeed, perspective taking has been found to decrease egocentric biases (Caruso, Epley, & Bazerman, 2006; Epley et al., 2002; Savitsky et al., 2001; Yaniv & Choshen-Hillel, 2012; Zhang & Epley, 2009), especially when the target is presumed to be similar to oneself (Todd, Simpson, & Tamir, 2016).

Reducing an egocentric bias in judgment, however, does not necessarily mean that people will understand another's perspective more accurately. In cases where another's perspective is known to be similar, decreasing reliance on an egocentric default would systematically decrease accuracy (Hoch, 1987). Most research examining the impact of perspective taking on judgment accuracy does so in situations where an egocentric bias is already known by researchers to be producing a systematic error, so that reducing reliance on it would necessarily increase accuracy. For instance, in the communication game described earlier where people tended to look at an object in a grid suggested by their own egocentric perspective (Epley, Keysar, et al., 2004; Epley, Morewedge, et al., 2004), reducing the tendency to look first at the egocentric object would necessarily increase the likelihood of looking at the correct object simply because one common distraction has been removed from the scene. This does not necessarily mean that people actually understand the mind of another person better, but rather that they rely less on their own perspective to begin with. Testing whether encouraging perspective taking explicitly increases the accuracy of mental state inferences requires examining cases where there is not already a known egocentric bias guiding judgment. Are people, for instance, better able to infer another's emotional experience, detect lies from truths, or anticipate another's attitude or preferences when they explicitly put themselves in that person's shoes? In a series of 25 experiments, we found no evidence that perspective taking systematically increases accuracy across a wide variety of mental state inferences (Eyal et al., 2018). If anything, perspective taking tended to decrease accuracy, albeit significantly only in a meta-analysis of all 25 experiments. In another condition of an experiment described earlier where people were trying to predict how attractive they would be rated by another person, perspective taking again did not systematically increase accuracy (if anything, it again decreased accuracy; Study 2, Eyal & Epley, 2010; see also Loewenstein, Issacharoff, Camerer, & Babcock, 1993). Perspective taking encourages people to use information they can generate about another person when imagining themselves as the other person. If that new information is systematically mistaken, such as when

people are overly cynical about another's motives, then increasing reliance on it will systematically decrease accuracy (Epley et al., 2006).

At this point, existing evidence suggests that any increase in accuracy from perspective taking is coincidental rather than systematic, arising in cases where researchers know there is a gap in perspective rather than occurring across a wide range of naturally occurring mental state inferences. Shifting one's perspective to consider another's point of view has reliable effects on the perceiver, such as decreasing egocentric biases, but it does not seem to systematically increase accurate insight into the minds of others.

4.2 Altering stereotyping

Few psychological constructs are derided more enthusiastically, by psychologists and laypeople alike, than stereotypes. "Unfortunate" (Banaji & Greenwald, 2013), "faulty" (Allport, 1954), and "hateful" (Stangor & Schaller, 1996) are just a few of the common descriptors that social psychologists have offered. Eliminating their use would therefore seem to be a plausible approach for increasing the accuracy of mind perception. Although stereotyping is often conflated with negative consequences of prejudice, for the sake of interpersonal accuracy, stereotypes are simply beliefs about groups that tend to be moderately aligned with average group characteristics. Would reducing reliance on stereotypes increase the accuracy of judgment?

As with egocentrism, the answer is highly circumscribed. Using a stereotype to make inferences about individuals is likely to increase accuracy when perceivers lack accurate individuating information about the target, when the individuating information available is ambiguous, and when the stereotype itself happens to be highly accurate (Jussim, Harber, Crawford, Cain, & Cohen, 2005). Of course, none of these attributes are likely to be known to perceivers themselves, and are recognized by researchers only in hindsight once the generalized accuracy of a given stereotype is known. For instance, women in one experiment watched videos of new mothers interviewed about their recent childbirth and predicted what the new mother was thinking each time researchers stopped the video (Lewis, Hodges, Laurent, Srivastava, & Biancarosa, 2012). Coders rated the stereotypicality of mothers' thoughts, and also the accuracy of perceivers' inferences by comparing them to the mothers' actual reported thoughts at each stopped point in the video. Results indicated that perceivers who made more stereotypical judgments about the new mother's thoughts were also more accurate. Obviously, accuracy was then highest when new mothers' experience was stereotypical. In this case,

reducing reliance on a stereotype may have decreased accuracy unless perceivers were able to identify more accurate information to use in its place.

We know of no research, however, that directly encourages people to either avoid or use stereotypes and then measures the accuracy of mental state inferences. Some research suggests that people could be sensitive to the validity of individuating cues, and hence may be more likely to rely on stereotypes when they are perceived to be the most accurate source of information. In one such study, people predicted politicians' attitudes after receiving presumably diagnostic versus nondiagnostic individuating information (Crawford, Jussim, Madon, Cain, & Stevens, 2011). Participants were more likely to make stereotypic judgments (based on whether the target was Democratic or Republican) when making inferences about an attitude (such as support for abortion rights) after hearing presumably less diagnostic individuating information (e.g., the politician's attitudes about same-sex marriage), compared to more diagnostic information (e.g., the politician's support of stem-cell research). Accuracy, however, was not assessed in this experiment, so the degree to which people spontaneously moderate stereotype use to maximize accuracy remains unclear. This is an important topic for future research. At this point, the best advice psychologists can give to those trying to understand the minds of others more accurately is to rely on stereotypes when they are highly accurate and to avoid them when they are not, advice that is not exceptionally helpful in real life because people rarely know the actual accuracy of any given stereotype.

4.3 Enhancing behavioral inference: Utilizing body language

The term "body language" suggests that bodies can speak, revealing one's inner-most mental states to others either by broadcasting them deliberately to others or by leaking out even when they are trying to be concealed. Most research studying interpersonal sensitivity focuses on how accuracy is derived from observable cues, guided loosely by Brunswick's "lens model" (1952). This work examines how different behavioral cues made available to perceivers, such as vocal cues versus nonverbal cues, affect accuracy (Hall & Schmid Mast, 2007; Ickes, 2003; Kraus, 2017; Kruger et al., 2005; Littlepage & Pineault, 1981; Mehrabian & Wiener, 1967; Zaki et al., 2009). As reviewed earlier, this research typically finds that verbal behavior (including linguistic and paralinguistic content) is a more valid cue for understanding people's mental states than nonverbal behavior. A person's body turns out to speak considerably less clearly than their actual voice.

Experiments that have exposed participants to the same cues and simply instructed them to attend to one cue or another are relatively scarce. In one lie detection experiment, participants were instructed to pay attention to the target's tone of voice or words or visual cues, or were not given specific instructions. Participants instructed to attend to the target's tone of voice outperformed all other participants in detecting truths but not in detecting lies (DePaulo, Lassiter, & Stone, 1982). Other research has tested the effect of instructing observers to attend to specific behavioral cues that are known to be accurate, compared to a control condition in which participants received no specific instructions. In one such study, participants either received instructions to look for accurate cues (e.g., reduced head movements, incomplete smiles, increased pitch) while trying to detect whether a target is telling the truth or lying or did not receive any instructions. Participants instructed about the cues were more accurate than those who were not (Fiedler & Walka, 1993), suggesting that modest gains can be observed within a given sample if asked to attend to cues known to be accurate but that people are unlikely to attend to these cues spontaneously. A meta-analysis of 37 studies that examined the effect of instructing or training perceivers to attend to another person's behavioral cues found a positive yet relatively small effect ($d = 0.36$). Training was most effective in this meta-analysis for improving detection of others' comprehension and least effective for detecting deception (Blanch-Hartigan, Andrzejewski, & Hill, 2012). These experiments focusing on bodily cues did not, however, compare accuracy against other behavioral cues a person could use, and hence the relative effectiveness of training people to read bodily cues is unknown.

Existing research makes it clear that a person's body language can indeed speak, but it does not do so especially clearly, and other cues—such as what a person says—carry considerably more accurate information. Some researchers have suggested that more subtle cues, referred to as micro-expressions, may reveal accurate emotional experiences in very brief flashes of emotional expressions. However, the only existing study examining the natural frequency of microexpressions found them to be exceptionally rare (observed in only 14 of 697 expressions) and nondiagnostic (7 revealed a true emotion and 7 a false emotion; Porter & ten Brinke, 2008). Even when micro-expressions are revealing a true emotion, people seem unable to detect them naturally with any degree of accuracy. Only high-speed cameras and trained judges could detect them (ten Brinke & Porter, 2012). The modest insight that comes from bodily cues may be somewhat surprising. People tend to overestimate how clearly their own bodies are revealing their inner

emotional states (Gilovich et al., 1998), and also overestimate how much accurate information about another's emotional experience is gleaned from observing nonverbal behavior compared to other cues (Zhou, Majka, & Epley, 2017). The effectiveness of reading "body language" is frequently hyped in the popular press. It was even endorsed in a roughly 1 billion dollars behavioral identification program by the Transportation Security Administration of the United States, who attempted to train their agents to spot passengers' subtle behavioral cues to deception (subsequently deemed completely ineffective; https://www.gao.gov/assets/690/686001.pdf). These results all suggest that reading "body language" is an overhyped method for understanding the mind of others.

4.4 Bypassing inferences: Perspective getting

In the classic novel *To Kill a Mockingbird* (Lee, 2002, p. 33), Atticus Finch preaches to his young daughter Scout: "you never really understand a person until you consider things from his point of view … until you climb into his skin and walk around in it." This famous quote reflects Lee's understanding that in order to accurately evaluate the mind of another person, you cannot simply guess at another's mental state or take the person's perspective as a process of inference, you must actually "get" the other person's perspective directly. Lee highlights one of two ways such "perspective getting" can occur: by directly simulating another's perspective by putting oneself in exactly the same situation as a target. The other way is by directly asking the other person what is on his or her mind. We will review the evidence on simulation and direct questioning, in turn.

Considerable research highlights the effectiveness of matching another's perspective through direct experience. In one experiment, people who had just experienced a physically painful procedure were more accurate in predicting another person's experience than those who had not experienced the same procedure (Ruben & Hall, 2013). In another, people more accurately predicted another's reaction to social exclusion after being excluded in the same way themselves, compared to people who had not been excluded (Nordgren, Banas, et al., 2011). In a third, people predicted a target's emotional reaction to viewing a picture far more accurately when they could see the picture themselves, and hence were in the same situation as the target, compared to when they were trying to read the target's emotional expression (Zhou et al., 2017). The benefit of getting perspective from direct simulation may extend to predicting one's own future mental states as well. Women in

one experiment were more accurate in predicting how much they would like a man after a 5-min speed date when they learned of a prior woman's evaluation, compared to basing their prediction on the man's personal profile and photograph (Gilbert, Killingsworth, Eyre, & Wilson, 2009). Not only can you understand others' minds more accurately by getting perspective, but you can also understand your own future mind more accurately by getting perspective from a person who has already been in the same situation.

Perspective getting through simulation increases accuracy because of similarity in people's reactions, thereby using egocentric projection effectively. If one person's experience in a situation is quite different from another's, or the simulated experience proves to be a poor proxy for another's experience, then getting perspective through simulation will be of limited value or may even decrease accuracy (Hodges, Kiel, Kramer, Veach, & Villanueva, 2010). For instance, participants in one experiment simulated the experience of blindness by wearing a blindfold for a period of time (Silverman, Gwinn, & Van Boven, 2015). These participants subsequently provided more negative evaluations of a blind person's capacities than people who had not simulated momentary blindness using a blindfold. This experiment did not measure accuracy, but we suspect that this simulation likely diminished participants' accuracy because the momentary experience of blindness is likely to be a poor proxy for a permanent experience of blindness that one has adapted to. Accurate insight comes from being in the exact same situation as another person, a requirement that may not always be practical in everyday life.

Perhaps the simplest strategy for getting another person's perspective, however, is to just ask another person what is on his or her mind. If you want to know someone's attitude in order to predict his or her behavior, for instance, it is hard to beat a direct self-report even when compared against sophisticated implicit measures of attitudes (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). In recent decades, survey researchers have been able to predict political elections with extremely high accuracy because they have become experts at getting the electorate's perspective through direct questioning (Silver, 2012). And in one experiment in our lab that compared the effectiveness of perspective getting through direct questioning against a condition in which participants were asked to engage in perspective taking and a no-instruction control, those who directly asked another person to report his or her preferences were dramatically more accurate in later predicting the person's survey responses than participants in either the perspective taking or control condition (Eyal et al., 2018).

As with the potentially obvious limits of using simulation to get another's perspective, direct questioning and self-report has its own obvious limits. First, people may be unwilling to provide an accurate answer. This concern could be exaggerated because even direct questioning in these cases may reveal more accurate insight than other approaches to increasing accuracy. One experiment, for instance, examined how perspective getting through direct questioning might affect lie detection accuracy, a case where people are obviously unwilling to tell the truth in self-report (Levine, Shaw, & Shulman, 2010). The targets of judgment in this experiment had either cheated on a prior task, or not cheated, and were later videotaped answering some questions about the incident. Some targets were asked directly about the main question at hand. Specifically, they were asked directly if they had cheated earlier in the experiment, and if they were currently telling the truth. Participants in this condition were significantly more accurate detecting whether the target was lying or telling the truth, doing so correctly 68.5% of the time compared to only 44% accuracy in the control condition that simply listened to the targets answering a series of background questions. Even when someone is reluctant to respond honestly, asking a person what's on their mind directly may reveal useful cues through a person's voice.

Second, perspective getting through direct questioning may be limited because people cannot always accurately report on their mental states (Nisbett & Wilson, 1977). Social psychologists are well aware of this critique, but this critique also has its limits. Recent evidence indicates that implicit measures of attitudes, developed specifically in response to concerns about the validity of conscious self-reports, can be predicted by participants themselves (Hahn, Judd, Hirsh, & Blair, 2014). This suggests that implicit measures are not inaccessible to participants but instead may be conscious attitudes that people are reluctant to express for social desirability concerns. Indeed, asking people directly about socially sensitive topics, like racial attitudes, proves to be a better predictor of implicit attitudes than any other known approach (Axt, 2018). In addition, the primary limits of self-reports are in explaining the operation of mental processes—*why* you are thinking or feeling a certain way—rather than in explaining mental contents—*what* you are thinking or feeling at a given time. Those mental contents are the mental states that mind perception is typically trying to infer. Getting another's perspective by asking for a direct report is an obviously imperfect remedy for understanding the minds of others, but it seems notably better than any of the other more limited approaches that a person might take in everyday life.

4.5 Confidence in strategies: Do people know when they know?

Accuracy rates can vary widely across different strategies for understanding the mind of another person. These accuracy rates can be readily assessed by researchers, but they are not so readily assessed in the course of everyday life where feedback is limited, imperfect, and idiosyncratic. A person's use of a given strategy is likely to be determined by his or her confidence in its accuracy, but the imperfect nature of feedback means that people may not recognize when they are using an effective versus ineffective strategy for social inference. Indeed, existing research suggests that people have a relatively limited sense of what provides good sense about the mind of others and what provides nonsense (Ickes, 1993; Realo et al., 2003).

When trying to detect lies, for instance, "shifty eyes" is commonly endorsed around the world as an accurate cue for lie detection, whereas research consistently shows it is an almost entirely useless cue (The Global Deception Research Team, 2006). Existing research demonstrates that a person's mind is communicated more clearly though vocal cues, but people themselves predict that they both communicate and interpret mental states equally well when communicating over text or with their voice (Kruger et al., 2005). And people understand the minds of others when they get perspective through a direct simulation of another's experience, but participants in one of our experiments consistently thought that simulation would decrease their ability to predict another person's emotional experience, compared to reading a person's behavior through their facial cues (Zhou et al., 2017; see also Gilbert et al., 2009). These results all suggest a significant disconnect between the strategies that bring accurate insight into the mind of another person and people's recognition of that accuracy.

Perhaps the most dramatic demonstration of this gap comes in the accuracy of perspective getting through direct questioning. In one experiment described earlier (Eyal et al., 2018, Experiment 25), we asked one member of a romantic couple to predict how his or her partner would respond to a series of consumer preference items. Before making their predictions, predictors were assigned to one of five strategy conditions: to get the other person's perspective by directly asking the partner all the questions from the survey (without providing a scale response), to get the other person's perspective by directly asking the partner about half of the questions from the survey (either even or odd numbered items), to take their partner's perspective, or to simply use whatever strategy they wanted to use (not one participant asked to question their partner). As can be seen in Fig. 5,
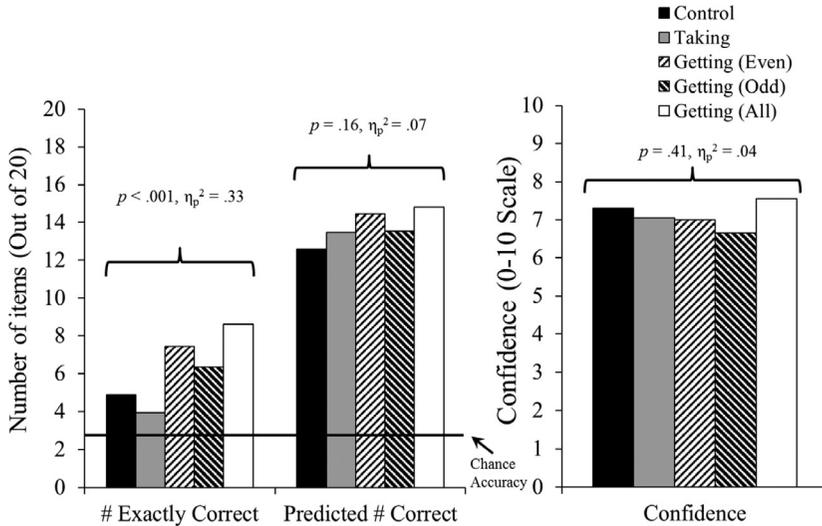
Fig. 5 Number of items romantic couples guessed exactly correctly about their partners compared to the exact number predicted correctly and their subjective confidence among people in Perspective Taking, Perspective Getting (All Items, Even Items, or Odd Items), and Control conditions (Eyal et al., 2018).

accuracy varied dramatically. Participants in the perspective getting (all) condition answered, on average, 8.6 questions exactly correctly (i.e., the precise rating on the scale, out of 20 questions) compared to 4.0 and 4.9 in the perspective taking and control conditions, respectively. However, when asked to predict how many items they answered exactly correctly, we observed no significant differences across conditions, with an average estimate of 13.7. We also observed no difference in their reported subjective confidence in the accuracy of their predictions. Those who used a completely ineffective strategy for understanding the mind of another person accurately—perspective taking—thought they were just as accurate as those who had used the most effective strategy we could think of—perspective getting through direct questioning. It may seem completely obvious in the abstract that asking what another person thinks, believes, feels, or wants is the best way to understand what is on the person's mind, but it does not seem so obvious to people who are in the midst of making these inferences.

Failing to recognize what brings interpersonal accuracy matters because it may lead people to choose ineffective strategies, thereby perpetuating misunderstanding. The research we have reviewed so far suggests that people may often be overconfident in their mental state inferences,

failing to recognize that strategies that do not rely on these inference processes (namely, perspective getting) may actually yield more accurate judgments. One interesting topic for future research involves investigating whether overconfidence in intuitive judgment serves as a barrier to the use of more effective strategies. One reasonable hypothesis is that intellectual humility—a recognition of overconfidence in one's own judgment (Leary et al., 2017)—might lead people to rely less on intuitive strategies based on egocentrism, stereotyping, or behavioral inference and to engage in a more bottom-up process of perspective getting instead. A promising path for future research would be to test whether increasing humility about one's understanding of the minds of others would facilitate accuracy. Initial support for this proposal comes from recent correlational studies in which those who were high on measures of intellectual humility also reported greater openness to new information than those low on intellectual humility (Hoyle, Davisson, Diebels, & Leary, 2016; Leary et al., 2017; Porter & Schumann, 2018). One experiment that manipulated intellectual humility by asking participants to explain complicated public policies, thereby exposing their lack of knowledge, found that these participants also became less extreme in their attitudes (Fernbach, Rogers, Fox, & Sloman, 2013). Becoming aware of one's fallible inferences about others' mental states might therefore lead people to rely less on inferences and more on getting the specific individuating information directly from the other person.
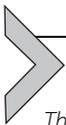
5. Conclusions

The only true voyage of discovery, the only fountain of Eternal Youth, would be not to visit strange lands but to possess other eyes, to behold the universe through the eyes of another, of a hundred others, to behold the hundred universes that each of them beholds, that each of them is.

Marcel Proust (1923/1999)

No supernatural power will ever enable one person to experience the world through the eyes of another. Instead, evolution has equipped the human brain with a highly sophisticated capacity for social cognition that can infer another's experience through a variety of inferential tools. Psychologists in the first half of the 20th century attempted to understand how well these tools worked, whereas psychologists in the second half largely abandoned this effort and focused instead on how the tools actually worked. How a tool works is directly connected to how well it works, and psychologists of the

21st century are now in a better position than ever before to connect the processes that enable interpersonal understanding to the patterns of accuracy and error that they produce.

We have attempted to do so by distinguishing between the activation and application of mental state inferences, identifying how a failure to activate processes that guide mind perception can help to explain instances of anthropomorphism and dehumanization. People can attribute minds to agents that lack them and fail to attribute minds to those who clearly have them. Psychologists interested in studying mental state inferences should look far beyond other people as possible targets of judgment (Waytz, Epley, et al., 2010).

Once activated, three basic psychological processes are applied to guide mental state inference: egocentrism, stereotyping, and behavioral inference. Each is an intuitively appealing tool for understanding the mind of another person because each provides some degree of accurate insight, but multiple tools exist because each one provides some degree of systematic error and is not equally well suited for all situations. Egocentrism can lead people to overestimate the extent to which others' minds match their own. Stereotyping can lead people to overestimate the degree to which others' minds match a group's average, or to overestimate the differences between individuals. And behavioral inferences can lead people to overestimate the extent to which others' minds match intuitive evaluations of their observed actions. As Gilbert noted (Gilbert, 1998), "Inferential errors are not random deviations from a standard; rather, they are often the results of habits of thought that work quite well in one context but not so well in another." Indeed, most attempts to increase the accuracy of mental state inferences have produced only highly circumscribed success, because even improving the use of a habit in one context does not guarantee increased accuracy in another. We have suggested that the most consistently effective approach is to avoid some of these inferential processes altogether by getting another's perspective directly. Such *perspective getting* can be accomplished either by putting oneself in the exact same situation another is facing, or by simply asking another person to report what is on his or her mind.

Psychologists have now learned much about what enables interpersonal accuracy, but this knowledge does not seem so readily known to those trying to understand the minds of others in their everyday lives. Research in the coming decades may shift its focus from trying to understand how the tools of mental state inference enable accuracy and error, to trying to understand how people select the tools used for mental state inference in the first place.

People seem largely unaware of which tools enable accurate insight and which do not. It might seem obvious that the best way to know what's on another person's mind is to just ask them, but those actually using this most effective tool may be no more confident in their insight than a person who has used an almost completely ineffective strategy. Social psychologists now understand which tools can best help people to "behold the universe through the eyes of another." The next frontier will be understanding how to help people use them.

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