# Solving the (Real) Other Minds Problem

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## Abstract

People care about others' thoughts, feelings, and intentions but can have considerable difficulty reading others' minds accurately. Recent advances in understanding how people make such inferences provide significant insight into when people are likely to be reasonably accurate mind readers and when they are not. People tend to reason about others' mental states by starting with their own and only subsequently adjusting that egocentric default to accommodate differences between themselves and others. Such adjustments tend to be insufficient, rendering final estimates egocentrically biased. When more information about others is available, people tend to rely on existing stereotypes or other expectations to intuit others' mental states. Systematic errors resulting either from excessive egocentrism or inaccurate expectations can lead to miscommunication, misunderstanding, and social conflict, but these biases also suggest useful strategies for improving mind reading in everyday life.

Anyone who has spent time within shouting distance of a philosopher has heard of the Other Minds Problem. The problem itself is simple – people directly experience their own but not others' mental states and therefore cannot conclude with certainty that other people have any mental states at all. But like many philosophical problems, this one seems to be a problem only for philosophers themselves. The average person gets over this version of the other minds problem sometime around the age of 5 (Callaghan et al., 2005) and from that point on makes rapid and routine inferences about others' thoughts, feelings, intentions, motivations, attitudes, impressions, and goals. Such inferences about mental states can then be used to make predictions about another person's behavior, such as whether another person is likely to vote in an election, donate time to a charity, or accept one's marriage proposal. This mind–reading tendency, once formed, is so pervasive that people even see mental states in all sorts of other agents, from gods to gadgets to geometric shapes (Epley, Waytz, & Cacioppo, 2007; Guthrie, 1993; Heider & Simmel, 1944). Seeing mental states in other agents seems to be absolutely no problem at all. The *real* other minds problem for most people in their everyday lives is seeing others' mental states accurately.

This is an obvious problem precisely because people do not perceive others' mental states directly and must instead infer them from a variety of indirect methods, including observations of behavior, second-hand reports from others, or sheer intuition. This problem arises not only when looking into the minds of other people, but it also arises when looking into the minds of future versions of ourselves (Wilson & Gilbert, 2003). People marry, divorce, accept jobs, and save for retirement at least in part based on beliefs about what will make their future minds feel happy and contented. Solving this particular version of the other minds problem is therefore critical not only for effectively guiding our behavior towards others in the present but also for effectively guiding our decisions for the future. Mind reading mistakes can lead to miscommunication, misunderstanding, social conflict, and poor decision-making. Although challenging, people have developed a variety of tools for solving this real version of the other minds problem. These tools work considerably better than random guessing, but they are far from perfect and can leave a considerable amount to be desired – a bit like using a toothbrush to clean the kitchen floor.

## A Mountain or a Mole Hill?

Labeling something a 'problem' immediately calls for diagnostic testing to document its magnitude. People have problems intuiting others' mental states accurately, to be sure, but a simple diagnosis of the severity of this problem is nearly impossible because the target is constantly moving. People are fairly impressive mind readers in some instances and undeniably terrible in others. For instance, one meta-analysis (Kenny & Depaulo, 1993) revealed that people are reasonably good at intuiting how others *in general* will evaluate them on a series of traits, such as intelligence, honesty, and extraversion (average $r = 0.51$), but are little better than chance at determining how *specific* individuals within that group will rate them uniquely on these very same traits (average $r = 0.13$). Some people (e.g., those high in intelligence and those older than 5) seem to be consistently better mind readers than others (Callaghan et al., 2005; Davis & Kraus, 1997; Realo et al., 2003). Some cultures (e.g., collectivist ones) seem better at training mind readers than others (Cohen & Gunz, 2002; Wu & Keysar, 2007). Some people's minds (e.g., one's close friends) are often easier to read than others (e.g., Stinson & Ickes, 1992; but see Kruger, Epley, Parker, & Ng, 2005). And sometimes simply trying harder to accurately read another's mind improves accuracy (Epley, Keysar, Van Boven, & Gilovich, 2004), but often it does not (see Myers & Hodges, forthcoming).

One's mind reading ability is therefore different from many physical abilities such as leaping or unicycling that are relatively constant across time and space. Diagnosing mind reading accuracy is instead more like diagnosing the flu – sometimes people have it (in varying degrees of

magnitude), and sometimes people don't. Accurate mind reading is not simply a trait that some people possess and others don't, but is rather a more variable state that people can have at some times more than at others.

Unlike the flu, however, people seem to know very little about exactly which state they are currently in, and when exactly they are good mind readers and when they are not. One recent investigation (Realo et al., 2003), for instance, reported a correlation ranging from $-0.02$ to $0.00$ between people's beliefs about their mind reading ability and their actual ability across three different measures (see also Ickes, 1993; Ames & Kammrath, 2004). Mistakes in mind reading are often masked because people's beliefs about themselves and others can be self-fulfilling (Jones, 1986; Sherman, 1980; Snyder, Tanke, & Berscheid, 1977), because others never reveal their true thoughts for direct comparison, or because others' reports of their thoughts and intentions may be accepted as true when they match our expectations but rejected as lies when they do not. At the very least, self-reported symptoms should not be trusted when diagnosing this problem.

Psychologists can provide a substantive contribution to this morass of mind reading variability by clearly identifying the mechanisms that enable this ability in the first place, in exactly the same way that a physician contributes insight into understanding the flu by identifying a mechanism for its expression. People engage in mind reading when they reason about others' beliefs, attitudes, knowledge, thoughts, or emotional states and also when they make predictions about another's behavior based on their underlying mental states. At this point, there is no empirical reason to distinguish between people's inferences about these differing kinds of mental states, as there is no clear evidence that they are guided by different underlying psychological mechanisms. This review will focus most heavily on people's attempts to infer another person's impressions, evaluations, attitudes or beliefs, only because these mind reading activities have been the most heavily researched. However, understanding how people intuit others' mental states across all domains in which people engage in mind reading can help to explain when people are likely to do this well, when they are likely to do it poorly, and how to make people better mind readers.

## How? Psychological Mechanisms for Mind Reading

Oliver Sacks (2003) provided a vivid account of what it is like to go blind later in life and in so doing unintentionally provided a revealing example of everyday mind reading as well. In this account, Sacks describes two extreme outcomes that can develop when people go blind as adults – one in which people lose their sense of the visual world and stop experiencing mental imagery altogether, and another in which people do precisely the opposite and hone their mental imagery to an extreme level of acuity.

This latter group of hypersensitive mental imagers is often able to do things that would never seem possible for a blind person, including one man (Torey, 2004) whose carpentry skills became so proficient that he was able to replace all of the roof gutters on his multi-gabled house single-handedly. This man reported that his neighbors were startled to see a blind person up on the roof doing carpentry, but that they were *especially* startled when they saw him doing it in the dark of night!

The reason for this heightened startle, of course, is because people found it easy to imagine the terror they would feel if they were working on a rooftop at night *themselves*, without recognizing that sunlight matters little to a person without functioning eyes to see it. This example highlights the first tool that people naturally and perhaps even automatically utilize to intuit others' mental states – simulating with their own mental states. Hearing a story about a child's death, an Olympic athlete's failure, or a lottery winner's luck automatically fills us with pangs of sadness, disappointment, and elation, respectively, because it is remarkably easy to imagine how we would feel in each of these situations. This simulated experience becomes a useful tool for intuiting another's thoughts when people, often correctly, assume from these clear signals that others would feel similarly.

That people tend to rely on such egocentric simulations when thinking about others is nowhere near a novel insight (for reviews, see Alicke, Dunning, & Krueger, 2005). Piaget (1932), for instance, argued that children come into the world with no awareness that others' perceptions may differ from one's own, resulting in a profound degree of egocentrism that any parent can recognize instantly. Later researchers elaborated on Piaget's initial findings and theorizing to show that young children do not reliably distinguish between what they know and what others' know (Perner, 1991; Wimmer & Perner, 1983), do not provide sufficient information to identify ambiguous references in communication (Deutsch & Pechmann, 1982; Sonnenschein & Whitehurst, 1984), and rarely distinguish between the way an object appears to them and the way it would appear to someone else (Flavell, 1986).

Adults seem to retain this egocentric default in judgment, but they are certainly nowhere near as egocentric as children. Social development often consists of learning, sometimes painfully, that others' perceptions may differ very fundamentally from one's own. People come to learn that their mothers are to be trusted but their politicians are not, that one employee is truly enthusiastic whereas another is only pretending to be enthusiastic, or that the average professor is more liberal than the average priest. This individuating information that people acquire about others, or groups of others, comprises the second tool that people utilize to intuit others' mental states. Stereotypes, expectations, and acquired theories about how others' minds work provides a rich storehouse of information for intuiting others' preferences, attitudes, beliefs, intentions, and other

mental states (Gopnik & Wellman, 1992; Karniol, 2003). This is obvious to any reader who has ever purchased a gift for a friend and attempted to purchase a gift that one's *friend* would like rather than a gift one's *self* would like, even if unable to do so successfully (Hoch, 1987; Waldfogel, 1993).

Everyday observation makes it clear that these two tools – egocentric simulations and individuating information – can be used as a guide for mind reading, but psychological research reveals some surprising features about *how* these tools are actually used. In particular, research suggests that one's own perspective is likely to serve as a common default or starting point when reasoning about others even among full-grown adults, and that individuating information is likely to be accessed only subsequently to adjust or correct an initial egocentric assessment. A blind man doing rooftop construction in the pitch dark may first strike a person as horrifying, an egocentrically based reaction that would only subsequently be adjusted by one's knowledge about this *particular* blind man.

This mental operation of adjusting an initial starting point or default is consistent with the use of what Tversky and Kahneman (1974) called the anchoring and adjustment heuristic. Faced with uncertainty about the answer to almost any question, people often start with something they know is close to the right answer and only subsequently adjust that starting point in a direction that seems appropriate (Epley, 2004; Epley & Gilovich, 2001; Tversky & Kahneman, 1974). Such adjustment processes are notoriously insufficient because they require attention that is often in limited supply and tend to terminate as soon as a satisfactory judgment is reached (Epley & Gilovich, 2004, 2006; Gilbert, 2002; Quattrone, 1982). As a consequence, people who begin with very different starting points also tend to end at very different stopping points. When intuiting the thoughts of another person, insufficient adjustment from an egocentric default will tend to produce final judgments biased in the direction of one's own initial judgment. A home owner may value her house at $500,000, for instance, but recognize that this figure is inflated by sentimental value that a home buyer will not share and therefore estimate that a home buyer will be willing to pay considerably less – '$480k would be great, but $460k is probably more likely.' A homebuyer looking at this same house may adjust in the opposite direction – 'I'd like to get the house for $400k, but $420k is probably more likely' (Van Boven, Dunning, & Loewenstein, 2000). Although this egocentric anchoring and adjustment suggests that an egocentric assessment is likely to be a common starting point for mind readers, it does not suggest that an egocentric assessment will *always* be a starting point. When the self seems like a poor proxy for others' thoughts, such as when others' are perceived to be very different than the self or when considerable information about another person is known, then an egocentric assessment is unlikely to be used as a starting point (Ames, 2004a,b; Epley et al., 2004a).

A variety of research findings are consistent with this dynamic anchoring and adjustment account. First, people tend to make egocentric responses more quickly than non–egocentric responses. In one experiment, for example, those who indicated that others would interpret a stimulus in the same manner as they did responded more quickly than those who indicated that others would interpret the stimulus differently (Epley et al., 2004; see also Smith, Coats, & Walling, 1999). In another experiment, participants were asked by an experimental confederate to move objects around a vertical grid (Keysar, Barr, Balin, & Brauner, 2000). Some of the objects could be seen only by the participant, whereas others could be seen by both the participant and the confederate. On critical trials, the confederate made an ambiguous instruction that could refer to two objects, one hidden from the confederate and one mutually observable. Analyses of participants' eye movements (a measure that enables real-time monitoring of cognition) showed that participants tended to look first at the hidden object suggested by an egocentric interpretation of the instruction and only subsequently looked at the mutually observable object.

This subsequent ability to correct an egocentric default, in fact, seems to be the critical difference between children and adults, not the initial tendency to be egocentric. In a third experiment using this same vertical grid procedure (Epley, Morewedge, & Keysar, 2004), children and adults did not differ from each other in either the speed with which they made an egocentric inference nor in the likelihood of considering an egocentric referent, but did differ in the speed and likelihood with which they corrected that egocentric inference to incorporate the other person's perspective. Adults may not end up behaving egocentrically, but it seems that they may begin by thinking egocentrically. Indeed, recent developments in neuroscience suggest an entire network of neurons dedicated solely to mimicking others' actions (Gallese, Keysers, & Rizzolatti, 2004). These mirror neurons may create an egocentrically based experience that can be readily used to make inferences about others' thoughts through egocentric simulation and only subsequent correction (Lamm, Fischer, & Decety, 2007).

Second, because an egocentric default is activated relatively automatically but adjustment requires both time and attention, anything that diminishes a person's ability to expend either time or careful thought should increase egocentric biases in judgment. Consistent with this account, people who are asked to respond quickly tend to make more egocentric responses when intuiting others' thoughts than do people who are able to respond at their leisure (Epley et al., 2004). And those who are unable to think as carefully because they are distracted by a concurrent processing task tend to make more egocentric inferences than those who are not distracted (Kruger, 1999; Lim, Keysar, & Epley, 2007).

Third, if people are using their own mental states as a default starting point and then only subsequently adjusting that default to accommodate differences between themselves and others until they reach a satisfactory

estimate, then anything that alters participants' likelihood of terminating their adjustment process should alter the magnitude of egocentric biases in judgment. To test this prediction, participants in one experiment (Experiment 4, Epley et al., 2004) were played an ambiguous 'backmasked' message (those interested in personally experiencing this effect can pause for a few minutes and visit http://faculty.chicagogsb.edu/nicholas.epley/research/clip.html). Half of the participants were told to listen for an ostensibly hidden phrase, thereby making the phrase very easy to hear, whereas the other half were told nothing, thereby making the phrase virtually impossible to hear. Participants then estimated the percentage of their peers who would be able to identify the hidden phrase in the music clip. While making these estimates, approximately half of the participants were induced to nod their heads up and down (as if indicating 'yes'), whereas the other half were induced to shake their heads from side to side (as if indicating 'no'). Previous research has found that people evaluate hypotheses more favorably while simultaneously nodding their heads up and down than when shaking their heads from side to side (Brinol & Petty, 2003; Wells & Petty, 1980), and people nodding their heads up and down have been found to adjust less from an initial default in judgment than people shaking their heads from side to side (Epley, 2004; Epley & Gilovich, 2001). Participants in this experiment were egocentrically biased when intuiting others' perceptions, with those who were told what to listen for expecting a larger percentage of their peers to hear the hidden phrase than those who were not told what to listen for. More important, this egocentric bias in mind reading was larger among people who were simultaneously nodding their heads up and down than among those who were shaking their heads from side to side. People seem, at least in these circumstances, to adjust an egocentric default until an adequate adjustment is made. Altering when an adjustment seems adequate also alters the magnitude of egocentric biases in judgment.

Finally, the process of mind reading seems to be moderated by factors predicted by, or at least consistent with, an egocentric anchoring and adjustment account. People call to mind specific anchors or defaults that are perceived to be useful, not those that are perceived to be useless (Epley, 2004). People should therefore be more likely to call to mind egocentric defaults, and rely upon them, when reasoning about others who are perceived to be similar to the self than when reasoning about others perceived to be different from the self. This is precisely what people seem to do (Ames, 2004a,b; Clement & Krueger, 2002; Krueger, 2007; Mitchell, Macrae, & Banaji, 2006; Robbins & Krueger, 2005). Defaults in judgment can also be overridden through repeated practice and training. People living in cultures that strongly emphasize a focus on others' perceptions and perspective (i.e., those living in collectivist cultures) seem better able to overcome an egocentric default than those living in cultures that emphasize a greater focus on the self (i.e., those living in

individualistic cultures; Cohen & Gunz, 2002; Wu & Keysar, 2007). Although more research is necessary to strengthen this conclusion, such cross-cultural differences do not seem to exist among young children (Callaghan et al., 2005) and may therefore develop only later in life. As with the difference between children and adults (Epley et al., 2004), these differences between cultures may reflect differences in controlled and effortful adjustment processes rather than differences in default tendencies in judgment (e.g., Lieberman, Jarcho, & Obayashi, 2005).

These results make it abundantly clear that the *inter*personal process of reading another person's mind is often based very heavily, if not entirely, on the *intra*personal process of reading one's own mind. As with many heuristics in judgment, the very existence of this particular heuristic is testament to its general usefulness and accuracy (Dawes & Mulford, 1996). Indeed, no other species on the planet is able to look into the minds of others as humans do (Hare, 2007), and humans seem to utilize the tools they have evolved to solve this other minds problem at least somewhat rationally. In the absence of information about others, simulation based on one's own mental states is exactly how a person ought to intuit others' mental states. People make reasonable attempts to adjust an egocentric default when alternate information about others is accessible, modifying their default in at least rough accordance with what one would predict from normative models of human judgment (Krueger, Acevedo, & Robbins, 2005). The problem for intuiting others' thoughts accurately is that being rational and being right are two different things. Seemingly rational agents can make profound mistakes due to incomplete knowledge, inaccurate beliefs, insufficient cognitive capacity, inappropriate generalizations, or imperfect heuristics (Krueger, 2007; Shafir & LeBoeuf, 2002). Under-standing this process that enables people to look into the minds of others gives insight into when people are likely to make profound mistakes and when they are not.

## How Well? Blind Spots in the Mind's I

If people intuit others' thoughts by either adjusting an egocentric default or by constructing a judgment based on existing stereotypes and expectations about well-known or dissimilar others, then the major mistakes in mind reading are most likely to stem from either inappropriate egocentrism or from inaccurate stereotypes. Psychological advances come from under-standing how these mistakes are likely to manifest themselves in varying degrees in everyday life.

### Inappropriate egocentrism

Unfortunately for mind readers, one's sensory experience of the external world is distinctly embodied. One's eyes, ears, and other sensory apparatus

project their input directly into one's brain, where such stimulation is interpreted based on one's own beliefs, attitudes, ideologies and mood. Such embodiment creates two major classes of egocentric biases that are likely to influence everyday mind readers. The first is an attentional bias. People see the world through their own eyes, looking out at the world from their own perspective onto others. This means that people are more likely to notice themselves, their contributions, and their private thoughts and experiences more than others will. This egocentric bias in attention can lead people to overestimate the extent to which others will give them credit for specific tasks performed within a group (Kruger & Gilovich, 1999; Ross & Sicoly, 1979; Thompson & Kelly, 1981), notice and attend to their own behavior (Gilovich, Medvec, & Savitsky, 2000; Savitsky, Epley, & Gilovich, 2001), hold subtle and nuanced impressions of their personality traits (Vorauer & Ross, 1999), identify subtle variability in their performance over time (Gilovich, Kruger, & Medvec, 2002), or utilize private information about their past when forming an impression (Chambers, Epley, Savitsky, & Windschitl, forthcoming). When one's own attention and focus diverges from others', so too does one's ability to intuit the thoughts, feelings, and other mental states that follow.

The second variety is a construal bias. A person's own perspective not only gives a different orientation and focus for their perceptual experience, but it also provides a lens of pre-existing beliefs, attitudes, intentions, and mood states that alters how they encode or interpret that perceptual experience, or how they reconstruct it from memory. Unfortunately for mind readers, these top-down construal processes operate invisibly, leaving very little or no conscious awareness of the ways in which their own perception is influenced and constructed by one's own egocentric perspective. As a consequence, it also gives very little or no awareness of the times in which their own interpretation of an event is likely to vary considerably from another's interpretation (Ross & Ward, 1996). Attempts to correct an egocentric construal to accommodate another's differing perspective are therefore unlikely to be activated at all or to be terminated prematurely, resulting in predictable egocentric biases. These biases are therefore most likely to arise in contexts where there are significant differences between one's own knowledge, expertise, attitudes, or emotional states and others', and in contexts that are inherently ambiguous and therefore open to differences in construal.

Recall, for instance, the 'backmasked' message experiment described earlier. Being told what to listen for enabled participants to clearly hear the message in a way that uninformed participants could not. But because this influence is every bit as invisible to conscious awareness as the perceptual process through which one's ear and brain turns waves of sound into the experience of music, those who were informed had little awareness of the full extent to which their perception had been contaminated by their expectations and therefore little ability to correct their

judgment sufficiently to recognize how the clip would sound to someone who was uninformed. It is now very clear why participants in the uninformed condition, who shared the same psychological perspective as the targets being predicted, were more calibrated than those in the informed condition, whose psychological perspective was very different than the targets being predicted.

One's own knowledge, beliefs, and emotional states can therefore be a curse when intuiting another's thoughts because they influence one's perceptions in a way that can make it nearly impossible to accurately intuit the mental states of someone with very different knowledge, beliefs, or emotional states (Keysar & Barr, 2002; Nickerson, 1999; Van Boven & Loewenstein, 2005). One person teasing another with an apparently friendly joke, for instance, tends to overestimate the extent to which their friendly intentions are equally obvious to the person being teased (Kruger, Gordan, & Kuban, 2006). People who know the answer to a problem tend to overestimate how easy the problem will be to solve for someone who does not know the answer (Keysar & Bly, 1995). People interested in starting a romantic relationship with another person tend to overestimate how clear their intentions were to their love interest (Vorauer & Ratner, 1996), whereas those who are dissatisfied in a relationship tend to overestimate hostile intentions in their partner's actions (Schweinle, Ickes, & Bernstein, 2002). And people who value a commodity because they happen to own it tend to overestimate how valuable the commodity will be to a buyer who does not own it (Van Boven, Dunning, & Loewenstein, 2000). The list of such construal biases is long, and their contribution to social conflict and misunderstanding is well articulated elsewhere (Pronin, Puccio, & Ross, 2002).

Understanding the power of construal provides several important insights into mind reading accuracy. In particular, it predicts that stimulus ambiguity will be an important, but potentially unappreciated, determinant of accuracy. Ambiguous stimuli, such as a potentially hostile question during a meeting, are more open to divergent construal than are more concrete stimuli, such as a punch in the face during a meeting. Ambiguous stimuli are therefore likely to increase the magnitude of egocentric biases (Gilovich, 1990), and mind readers should generally be less accurate in ambiguous contexts than in unambiguous ones. Indeed, people's impressions of themselves on concrete traits, such as athletic or punctual, are more consistent with others' impressions of them than they are on more ambiguous traits, such as talented or creative (Hayes & Dunning, 1997; see also Watson, Hubbard, & Wiese, 2000). People also tend to be more accurate evaluating the mental states of less ambiguous friends than of relatively more ambiguous strangers (Stinson & Ickes, 1992). Although researchers can identify these differences in accuracy, participants in these experiments may not. Because construal processes operate invisibly, people may be relatively unaware of how stimulus ambiguity can alter their own accuracy.

This possibility was shown clearly in a series of experiments invest-igating how well people could communicate subtle intentions, from sarcasm to jealousy, over mediums of communication that varied in ambiguity, namely from using e-mail to using the telephone or speaking face-to-face (Kruger et al., 2005). In one experiment, participants com-municated a series of 20 statements to another person, either over e-mail or over the telephone (using their voice). Half of these statements were intended to be sincere, whereas the other half were intended to be sarcastic (such that the intended meaning of the statement was the precise opposite of its literal meaning). Because e-mail is stripped of the paralin-guistic and non-verbal cues that serve to clarify such intentions, it is inherently more ambiguous than mediums that rely on one's voice. Indeed, recipients of these messages over e-mail were not significantly better than chance at decoding these intentions accurately but were considerably more accurate over the telephone. More important, this effect of ambiguity was completely lost on senders themselves, who predicted that recipients would accurately detect their intentions nearly 80% of the time regardless of the medium through which they were communicating. The relative invisibility of construal processes, coupled with egocentric defaults in judgment, makes it more understandable why people's beliefs about their ability to intuit others' thoughts are so weakly correlated with their actual ability (for reviews, see Ickes, 2003; Myers & Hodges, forthcoming).

*Inaccurate stereotypes*

It seems that people try to disregard their own perceptions when reasoning about someone perceived to be very dissimilar to them and in these cases base a mental state inference on the very stereotypes that make these others appear different. In one experiment, for instance, Columbia University students utilized their own preferences to infer the preferences of a randomly selected Columbia student, but instead used their stereotypes about Berkeley students to make inferences about a randomly selected Berkeley student (Ames, 2004a). Stereotypes represent generalized repre-sentations about groups of individuals. These stereotypes often contain some degree of accuracy for predicting a group in general (Jussim, McCauley, & Lee, 1995), but because they are generalized representations, they may not be accurate predictors of any single individual within that group (Stangor, 1995). Stereotypes may also serve to exaggerate small differences between groups that can therefore adversely influence the accuracy of any judgment. Beliefs about wide-ranging gender differences on a variety of psychological variables (even on mind reading), for instance, tend to grossly exaggerate the small differences that actually exist between men and women on a much smaller number of psychological variables (Hyde, 2005). So too do beliefs about the power of self-interest to influence

people's attitudes, intentions, and goals seem to overestimate its actual influence on these mental states (Miller, 1999). The implications of using stereotypes to predict others' thoughts is therefore extremely straightforward, in that they will tend to increase accuracy as function of their correspondence with group averages but are unlikely to be sensitive to the wide variability within these stereotyped groups.

## Improving Accuracy? How to Be a Psychic

Every mother at one point or another has implored her child to see things from someone else's perspective, and many adults could seem to use a refresher course on this bit of motherly advice. Conflicts and misunderstandings between individuals, groups, or nations frequently seem caused by the long list of egocentric biases outlined in this review and elsewhere (e.g., Nickerson, 1999; Royzman, Cassidy, & Baron, 2003) that lead to mistaken or inflammatory inferences about others' goals, intentions, or attitudes (Epley & Caruso, 2004; Pronin, Puccio, & Ross, 2002; Ross & Ward, 1996). As mother's advice suggests, the intuitive and obvious solution to the other minds problem is to make an active and concerted attempt to get into another's shoes. Although perspective taking may indeed have some beneficial social consequences (Batson, 1994; Galinsky, Ku, & Wang, 2005; Neale & Bazerman, 1983), categorically improving the accuracy of judgment is not among them. Sometimes, perspective taking is likely to help and sometimes it is not. Understanding how people intuit others' thoughts, and the nature of the biases they produce, helps to make this clear.

Recall that one's own perspective creates two classes of mind reading mistakes: one resulting from biased attention and the other from biased construal. Actively considering another's perspective is a useful antidote to mistakes resulting from biased attention because these result from overlooking information that might otherwise be available. For instance, group members tend to allocate responsibility for specific tasks egocentrically, and actively considering others' contributions leads to considerably more calibrated assessments (Caruso, Epley, & Bazerman, 2006; Epley, Caruso, & Bazerman, 2006; Savitsky, Van Boven, Epley, & Wight, 2005). People in the midst of an embarrassing moment tend to focus too much on the personally embarrassing offense and too little on the surrounding situational context, thereby leading people to overestimate how harshly they will be judged by others. Actively leading people to consider those additional factors that observers will actually consider leads to significantly more calibrated assessments (Epley, Savitsky, & Gilovich, 2002; Savitsky et al., 2001). And people predicting their own future reactions to a significant life event (such as moving to California or losing an important football game) tend to predict their future thoughts and feelings by focusing too narrowly on the event in question

and too little on the other events in one's future life that are likely to dilute the impact of this single event (Schkade & Kahneman, 1998; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000). Shifting one's perspective to focus on all of the other events that will likely be occurring at this point in the future aside from the focal event in question leads to much more calibrated assessments of one's own future mental states and emotions (Wilson et al., 2000). If an egocentric default leads mind readers to overlook information that is otherwise available, then altering attention through perspective taking should serve to calibrate their inferences.

Actively considering another's perspective, however, will likely be of little or no use for the second class of egocentric mind reading mistakes based on biased construal (or for mistakes resulting from using inaccurate stereotypes). The reason is that biased construal resulting from one's own beliefs, attitudes, and ideologies alter the way a stimulus is encoded at the time of evaluation, or the way it is reconstructed in memory. Considering another's perspective cannot alter one's construal of an event any more than actively trying to see colorblind will render a person unable to distinguish red from green. A red-blooded American cannot possibly, for instance, reconstrue their perception of a terrorist attack on New York by simply trying to see things from a terrorist's perspective. Nor can a father strip away the lens of genetic relatedness to view his son's aptitude or ability as a stranger would. Indeed, a long list of experimental results attests to the ineffectiveness of perspective taking to increase mind reading accuracy in conceptually related contexts (for reviews, see Ickes, 2003; Myers & Hodges, forthcoming). In one experiment, for instance, participants randomly assigned to play either the role of a plaintiff or of a defendant in a hypothetical court case differed in their perceptions of a fair settlement by nearly $18,000 in the egocentrically biased direction, a difference that active attempts to encourage perspective taking did nothing to reduce (Loewenstein, Issacharoff, Camerer, & Babcock, 1993).

Overcoming construal-based biases therefore requires a different approach for improving accuracy, one focused not on simply trying to add new information to one's judgment by adopting another's perspective, but rather one focused on attempting to alter people's initial encoding of a stimulus in the first place. As one example of how this might work, consider people's attempts to understand how they are viewed by others – whether others find one to be intelligent, kind, likeable, or attractive, for instance (e.g., Kenny & Depaulo, 1993). Such impressions are difficult to detect at least partly because people have so much more information about themselves than others do (Nisbett, Caputo, Legant & Marecek, 1973). People know that they are more attractive than they were yesterday, much smarter than many of their friends, or less likeable in the course of an interview than they had planned to be. Observers often know none of this. As a result of this asymmetry in information, people attend to lower-level details when thinking about themselves than when thinking

about others (Fiedler, Semin, Finkenauer, & Berkel, 1995; Semin & Fiedler, 1989). Accurately intuiting another's impression would require leading people to construe themselves at a higher level of abstraction, focused on central and defining features of themselves rather than on low-level details or idiosyncrasies. In effect, people could become better at intuiting others' impressions by altering how they construe themselves, metaphorically taking a big picture look at themselves that is more consistent with how they are viewed by others.

In one experimental test of this hypothesis (Eyal & Epley, 2007), participants were asked to anticipate how attractive they would be evaluated by another participant on the basis of a photograph taken in the laboratory. Half of the participants anticipated how they would be judged by someone looking at their picture *right now*. The other half of participants anticipated how they would be judged by someone *three months from now*. The latter condition encourages a higher-level self-construal than the former (Trope & Liberman, 2003), and participants were more accurate when intuiting how they would be evaluated 3 months from now ($M_{\text{absolute difference}}$ = 1.17, $r = 0.55$) than when intuiting how they would be judged today ($M_{\text{absolute difference}}$ = 2.42, $r = -0.24$). Encouraging participants to carefully adopt the other person's perspective did not, consistent with past research, significantly increase accuracy ($M_{\text{absolute difference}}$ = 2.00, $r = -0.10$). In another experiment using the same procedure, an individual difference measure of people's tendency to think about themselves in a high-level (abstract) versus low-level (concrete) fashion, measured by Vallacher and Wegner's Action Identification scale (1987), significantly predicted accuracy ($r = 0.38$), whereas a widely used measure of perspective-taking (Davis, 1983) did not ($r = 0.09$).

People solve problems by attacking their causes. Failing to understand what causes problems for everyday mind readers, and the associated conflicts that follow, can lead people to attack causes that have nothing to do with the problem and therefore have nothing to do with the solution. Using mother's advice to consider another's perspective can be helpful in some contexts, but helpless or even harmful in others (Epley, Caruso, & Bazerman, 2006). Those looking to encourage understanding, cooperation, and many of the other good things that come from accurately stepping into the mind of another person would do well to know the difference.

## Concluding Thoughts

People make such rapid and ready inferences about other people's minds that they appear to solve the classic philosophical version of the Other Minds Problem in approximately 5 seconds or less, but struggle for their entire lives trying to read others' minds accurately. People solve this latter, everyday version of the other minds problem in varying degrees of success, and psychological advances in understanding the varied tools

people utilize to solve this problem can help to explain such variability, as well as provide tools to improve this ability. Ongoing developments in this field of research include delineating a more complete theoretical framework for mind reading that integrates these varying tools into one overall structure (Karniol, 2003), illuminating the underlying neural foundations that enable mind reading (Gallese, Keysers, & Rizzolatti, 2004; Saxe, Carey, & Kanwisher, 2004), extending mental state inferences to understand how people perceive mental states in non-human agents (Epley et al., 2007; Gray, Gray, & Wegner, 2007; Kwan & Fiske, forthcoming), and exploring the implications of mind reading mistakes on one's own happiness and well being (Gilbert, 2006). Predicting what all of these researchers will think up next, however, is anyone's guess.

## Short Biography

Nicholas Epley has been employed as an Assistant Professor of Psychology at Harvard University (2001–2004), as a visiting scholar at the Peter Wall Institute at the University of British Columbia (2003), and currently as an Assistant Professor of Behavioral Science at the University of Chicago Graduate School of Business. His research investigates how, and how well, basic heuristics in judgment are utilized to make inferences about oneself and others. More information about publications, ongoing projects, and teaching can be found at http://faculty.chicagogsb.edu/nicholas.epley.

## Endnotes

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