

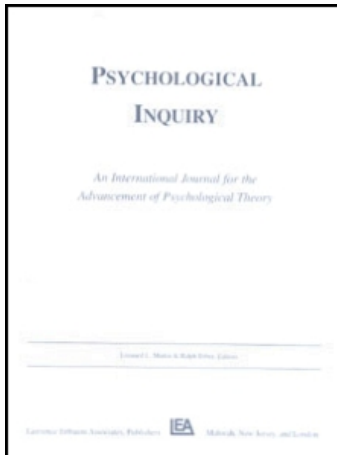
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Mindreading and Dispositional Inference: MIM Revised and Extended

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REPLY

Mindreading and Dispositional Inference: MIM Revised and Extended

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In response to the very insightful commentaries in this issue, I revised the multiple inference model (MIM) in two significant respects. First, I gave greater attention to the limits of mindreading, clarifying circumstances when perceivers merely infer traits within a target person. Second, and of greater importance, I more clearly specified the role of automaticity within the model, suggesting that much processing occurs in parallel. Rather than following a rigid sequence, inferences about situations, intentionality, mindreading, and traits can occur either intuitively or can occur in the context of analytic thought.

Everything turned on the shadowy question of intent

— Anthony Lewis, New York Times (January 10, 1997)

Years ago I was fortunate enough to take a hike in the Santa Ynez Mountains near Santa Barbara with the great Hal Kelley. Along the way, Hal generously shared two insights. The first was that, in any science, promising new ideas often go unappreciated. His observation was prompted by our earlier conversation in which I had outlined a rudimentary version of a multiple inference model of dispositional inference (later to become MIM). Hal had chosen a kind way of telling me that he didn't see quite see the point of MIM. To soften the blow, he mentioned that when Leon Festinger initially outlined his theory of cognitive dissonance to Fritz Heider, Fritz was initially unimpressed. Hal gave me a few pointers and encouraged me to further develop my theory, particularly by presenting it to other researchers who might be skeptical of my ideas. As a consequence of that conversation with Hal, I initially took a "go slow" approach to developing MIM, foregoing theoretical development in favor of providing an empirical foundation for the model (e.g., Reeder, Kumar, Hesson-McInnis, & Trafimow, 2002). In fact, my target article in this issue represents a first attempt at a formal statement of the theory.

Along that same mountain trail, Hal's second insight—seemingly unrelated to the first—concerned a confession that he often failed to see the implications of his own theorizing (e.g., Kelley, 1967). He said it

was the work of others (e.g., McArthur, 1972) that both demonstrated the worth of his original theoretical ideas and took the field in new directions. For that he was grateful. Likewise, I confess that until I read the insightful commentaries on my target article, I was blind to a number of researchable ideas raised by MIM's analysis. I wish to express my gratitude to the distinguished commentators in this issue who were so perceptive in pointing out these new research avenues. Along the way, their comments identified both the strengths and weaknesses of my target article. In my reply, I hope to synthesize many of these new ideas into MIM's analysis. Two major questions were raised in the commentaries: What types of information (e.g., traits vs. aspects of mindreading) do perceivers infer, and What is the role of automaticity when perceivers make judgments about intentionality, mindreading, and dispositions? That is, to what extent are the underlying processes intuitive and relatively automatic, as opposed to being sequential and under conscious control? In my attempt to answer these questions, MIM's analysis has been substantially revised and broadened. What emerges—I hope—is a clearer, more comprehensive, and insightful view of mindreading and dispositional inference.

What Types of Information Do Perceivers Infer?

A central claim of my target article is that social psychologists have focused on trait attribution at the expense of overlooking mindreading. Hamilton, Way,

and Chen (this issue) plot the long tradition in social psychology of emphasizing traits and dispositions within the process of impression formation. Much of that research suggested that perceivers undervalued situational factors (Ross & Nisbett, 1991) and omitted any mention of mindreading. Moreover, there is a long tradition of research on spontaneous trait inferences (STI) showing that perceivers can infer traits without having been asked to do so (Gawronski, this issue; Hamilton et al., this issue; Molden, this issue; Newman, this issue; Uleman, Saribay, & Gonzales, 2008). All of this, of course, argues for the centrality of traits in person perception.

In sharp contrast to this tradition, recent thinking suggests that perceivers may be at least as concerned with aspects of mindreading, including paying attention to situational factors that prompt a target person's specific beliefs and motives (Malle, 2004; Malle & Hodges, 2005; Newman, this issue; Read & Monroe, this issue; Reeder et al., 2002). For instance, after reading stories or watching videotapes of target persons in action, perceivers' open-ended impressions of the targets in these episodes typically center on the beliefs and motives of the targets, which are seen as arising from the surrounding environment. Consider a study in which perceivers watched a film about a target person who participated in one of Milgram's (1974) famous obedience studies. The film showed the target person obeying an experimenter who had instructed him to deliver painful shocks to an innocent person. Immediately after seeing the film, perceivers were asked to explain why the target behaved as he did. Perceivers frequently mentioned aspects of both the situation (e.g., the experimenter's orders) and the target's motives (e.g., wanting to placate the experimenter), yet rarely mentioned trait characteristics or dispositions of the target (Reeder, Monroe, & Pryor, 2008). Additional work asked perceivers to explain the actions of people they encounter in their everyday lives (Malle, Knobe, & Nelson, 2007). Once again, trait type explanations were infrequent.

So why did social psychologists allow trait attribution to take center stage for so long? In my target article, I noted some theoretical trends that guided the field, most notably Heider's assumptions about causal attribution and the focus on single inferences, as opposed to multiple inferences about others. But there are methodological issues also worth considering. In part, the answer may be as simple as "Ask, and you shall receive." That is, when researchers asked perceivers for trait attributions, perceivers readily supplied them. Katz and Braly (1933) asked respondents to check off trait adjectives that described a given ethnic group, Asch (1946) studied how people combined lists of traits to form a coherent impression, and STI research presented participants with simple behavioral descriptions and probed for spontaneous inferences about traits (Newman, this issue; Uleman et al., 2008).

For the most part, the dependent measures employed in such studies were not designed to reveal evidence on mindreading. In addition, the stimulus materials were relatively impoverished. Some forms of mindreading may emerge only when perceivers process complex social interactions, such as those involving a story format, videotaped episodes, or recollections of meaningful, real-life events (Ames, this issue; Hamilton et al., this issue; Molden, this issue; Newman, this issue).

Although mindreading has been neglected in social psychology, much of what we already know about trait inference may be relevant to it. For example, when perceivers infer traits, the content is often semantically similar to motive or goal judgments (Read, Jones, & Miller, 1990). Thus, traits and motives can be closely linked in terms of their cognitive associations (Collins & Loftus, 1975; Gawronski, this issue) and can mutually imply one another. For instance, if Miss Harrington is seen as high on the trait of ambition, perceivers might spontaneously infer that she is motivated to acquire money and status. In other words, a trait inference could automatically increase the accessibility of related motive inferences and vice versa. In this context, two points are worth emphasizing. First, it seems unlikely that there is a single sequence governing motive and trait inferences. In Figure 1 of my target article, I outlined a path whereby motive inferences could inform trait judgments. But I did not mean to preclude the possibility that inferences about traits could inform inferences about motives. Depending on the circumstances, either path could occur, or both types of inferences could occur in parallel (Gawronski, this issue; Morris & Mason, this issue; Read & Monroe, this issue). Second, the similarity between traits and motives suggests that some of the same paradigms employed in the study of trait inferences might profitably be employed to study mindreading. For example, the probe-recognition methods employed in the study of STI (Uleman et al., 2008) could be employed to study spontaneous mental state inferences.

Comparing Traits and Motives

Given the semantic similarities between traits and motives, it is important to note differences as well. The main difference is that motives refer to mental states involving the pursuit of behavioral goals (Heider, 1958; Malle, 2008), whereas traits often refer to stable behavioral predilections (Buss & Craik, 1980). As such, traits tend to be more abstract, pointing to summaries or prototypical patterns of behavior (e.g., extraversion or neuroticism). Some traits such as extraversion are also visible or easily observed, which promotes high consensus among observers regarding their presence in an individual (Albright, Kenny, & Malloy, 1988). In contrast, the perception of motivation is notoriously rooted in the eye of the beholder (Reeder, Pryor, Wohl,

& Griswell, 2005). For example, Americans and Canadians in favor of the U.S. invasion of Iraq in 2003 perceived then President Bush as having positive motives (e.g., to prevent the use of weapons of mass destruction and bring democracy to Iraq). In contrast, those opposed to the war perceived Bush as having quite negative motives (e.g., to gain power for the United States and control Iraq's vast oil reserves).

Another area of possible difference between traits and motives concerns the interplay between our own mental states and our perception of those same states in others. The relationship is bidirectional. On one hand, we may project our own mental states and motives onto others (Ames, 2004, this issue; Morris & Mason, this issue). For example, when participants were told about a group of hikers who lost their way, participants who had recently engaged in vigorous exercise (and were thirsty as a result) were prone to seeing the hikers as being especially thirsty (Van Boven & Loewenstein, 2003). Projection is especially likely when we feel similar to others (Ames, 2004; Morris & Mason, this issue). On the other hand, we are sometimes prone to simulating or assuming the mental states of others (Goldman, 2001). In fact, the discovery of *mirror neurons* in monkeys suggests a possible neural basis for entering into the minds of others. For example, after watching the goal-directed actions of others, related neurons and muscles may be activated in the observer (Decety, 2005; Fadiga, Fogassi, Pavesi, & Rizzolatti, 1995; Kinsbourne & Jordan, 2009). In general, it seems likely that processes related to both projection and simulation are more common for mental states than for traits. This would seem to be true especially for simulation. It is hard to imagine circumstances where one would simulate having another person's traits.

Typically, perceivers think of motives—but not traits—as being consciously represented in the person. Still, the difference between motive and trait is hardly clear-cut. For example some traits like *shrewd* and *deliberative* have a mental component and resemble motives in that respect. And other traits, such as *ambitious*, are similar to motives in possessing a goal component (Read et al., 1990). Moreover, people expect that both traits and motives will be expressed in behavior. Although motives may not be expressed directly in behavior, they tend to be seen as a driving force in the background, inspiring general patterns of action.

There are even exceptions to the idea that motives are perceived as consciously held mental states. For instance, partisans who opposed President Bush's actions in Iraq likely inferred Bush's motives without engaging in simulation, or placing themselves within Bush's mind. (Indeed, extreme partisans might find that to be revolting!) Even if it were possible to present such partisans with incontrovertible evidence that Bush's conscious mental states were entirely positive toward

Iraq, it is unlikely they would see his motives in a positive light. More likely, Bush would be seen as unaware of his "true" motives. In short, perceivers sometimes endorse the notion of nonconscious motivation (Morris & Mason, this issue; Reeder et al., 2005).

Conditions Favoring Mindreading Versus Trait Judgments

In the spirit of MIM, it is important to keep in mind that perceivers often infer *both* motives and traits in the impression. Nevertheless, there may be circumstances that favor one type of thinking over the other. Molden (this issue) notes that these two types of judgments may have different social functions. Trait judgments may be more useful for anticipating the general patterns of interaction in the distant future, whereas motive or goal judgments may be more useful for predicting specific behavior in the immediate environment (Nussbaum, Trope, & Liberman, 2003). In addition, Molden (this issue) offers some provocative ideas about the strength of cognitive links that exist between motives and target individuals on the one hand vs. traits and target individuals on the other hand (Srull & Wyer, 1989).

A few studies point to additional factors that govern the perceiver's preference for motive explanations over traits (Idson & Mischel, 2001; Malle, Knobe, O'Laughlin, Pearce, & Nelson, 2000; McClure, 2002). McClure holds that people explain common actions in terms of motives or goals, whereas they explain difficult or out-of-the-ordinary acts in terms of preconditions (including traits) that are thought necessary to enact the behavior. For instance, we might view Melanie's sudden interest in geophysics as motivated by wanting to compete in a school science fair, but view her actually winning the science fair as due to a trait like high intelligence. Additional research suggests that we are more likely to attribute motives and goals to friends and family members, whereas we tend to rely on traits to describe strangers (Idson & Mischel, 2001).

Finally, although MIM describes a process whereby motive inferences can guide trait attribution, we have already seen (as in the case of spontaneous trait inferences) that motive inferences are not necessary for all trait judgments (Ames, this issue; Hamilton et al., this issue; Newman, this issue). Some behaviors, although clearly intentional, are so simple as to preclude the need for perceivers to engage in any degree of mindreading. For instance, when a husband kisses his wife good-bye before heading for work, she might spontaneously infer his caring attitude without thinking any deeper about the interaction (Hamilton et al., this issue). On the other hand, ambiguous behavior with important implications for the perceiver is likely to spur more intensive, deliberate mindreading (Morris & Mason, this issue). For example, the quote at the beginning of this article was

inspired by the controversy over physician-assisted suicide. Suppose a physician administered large doses of opiates to relieve the pain of a terminally ill patient, resulting in the patient's death. The relatives of the patient might speculate endlessly about whether the physician's ultimate motive was to relieve pain or whether the intent was to induce a peaceful death. Issues concerning the spontaneity versus deliberate nature of mindreading are discussed more fully in the next section.

Rethinking the Automaticity of Processes Underlying MIM

As a corollary of stressing mindreading, MIM assumes that intentionality matters in person perception. That is, intentional acts are often explained differently than unintentional acts. The commentators are largely in agreement with this assumption (for an exception, see Read & Monroe, this issue). But the biggest bone of contention concerns the automaticity with which this is done (Gawronski, this issue; Hamilton et al., this issue; Molden, this issue; Morris & Mason, this issue; Newman, this issue; Read & Monroe, this issue). Do our judgments about intentionality, motives, and traits proceed in a conscious, deliberative, and sequential manner? Or do we automatically process all three types of information in parallel, at a nonconscious level? The short answer is "yes." Like most important questions in social psychology, the appropriate answer depends on the circumstances. An evolutionary perspective suggests that common cognitive operations were originally accomplished by primitive brain structures at a nonconscious level (Bargh, 2009). With increasing brain development in humans, many of these same operations became capable of being, in part, overlaid by conscious, deliberate thought. When engaging in mindreading and dispositional inference, therefore, modern social perceivers rely on a variety of processes—both automatic and controlled (Bargh, 2009; Uleman et al., 2008).

It is important to keep in mind that the *content* of an inference—whether it be about intentionality, motive, or trait—does not dictate the automaticity of the *process* (Kruglanski & Orehek, 2007). Inferences about all three types of content occur at both automatic and controlled levels of processing. Thus, any attempt to specify a single sequential path or temporal ordering of these three types of inferences is doomed to failure (Trafimow, this issue; but see Phillips & Knobe, this issue, for an alternative view). Nevertheless, issues of automaticity are crucial for any model of person perception. The fact that my target article was vague in this area represents, perhaps, its major limitation. When writing my target article, I found it a daunting task to specify these things for MIM. My strategy, therefore, was to mention a few possibilities regarding automatic

and controlled processing, imply that these processes lie on a continuum (Kruglanski & Orehek, 2007), and remain mute about the details. Fortunately, the commentators in this issue filled that vacuum with insightful process-oriented observations. In this section I aim to revise MIM so as to better specify automatic and controlled modes of processing. To the extent this revision succeeds, I owe my commentators a sincere debt of gratitude.

Here is the main question of interest: When perceivers consider the intentionality of behavior, engage in mindreading, and infer traits, how does the process differ at automatic and controlled levels of processing? In attempting to answer this question, I shall also consider how intentional and unintentional acts are sometimes processed differently at automatic and controlled levels. The discussion to follow begins with an overview of automatic and controlled processing and then considers the implications for inferences of intentionality, mindreading, and traits.

Overview of Intuitive and Analytic Processing

Intuitive, associative processing. At the earliest stages of processing, perceivers react on the basis of pattern recognition, associations, and stereotypical expectations about other people and the general nature of the world. Such reactions tend to be quick, relatively automatic, and done in parallel (Gawronski, this issue; Gawronski & Bodenhausen, 2006; Morris & Mason, this issue; Pryor, Reeder, Yeadon, & Hesson-McInnis, 2004; Read & Miller, 1993, 2005; Read & Monroe, this issue; Strack & Deutsch, 2004). Perceivers combine aspects of the immediate situation, the target person's actions, and other activated constructs (e.g., scripts, stereotypes, and expectations based on past experience with the target person) to obtain a rudimentary understanding of the behavior, including an appreciation of whether the behavior was intentional (Morris & Mason, this issue). This understanding may be accompanied by spontaneous inferences about the situation (Ham & Vonk, 2003), as well as spontaneous inferences about the target person's goals, motives, and traits (Hassin, Aarts, & Ferguson, 2005; Uleman et al., 2008). Although a variety of spontaneous inferences may be drawn, they tend to be tightly linked in terms of associative similarity (Collins & Loftus, 1975; Gawronski, this issue) or their script-like nature (Read & Monroe, this issue; Vonk, 1998). The perceiver's interpretation is subjective, influenced not only by recent events that increase the salience of activated categories (Gawronski, this issue; Higgins, 1996) but also by the goals of the perceiver (Gawronski, this issue; Molden, this issue; Newman, this issue). Nevertheless, the perceiver tends to experience his or her interpretation as

“real”—a valid and objective interpretation of what just occurred (Gawronski, this issue; Morris & Mason, this issue).

As an example of such intuitive or automatic processing, consider how eyewitnesses might have reacted to the following event. In December 2008, U.S. President George W. Bush had just finished a speech to a group of journalists in the International Zone of Baghdad in which he summarized his view of the U.S.–Iraq war: The work “hasn’t been easy, but it has been necessary for American security, Iraqi hope and world peace.” An Iraqi journalist named Muntadar al-Zaidi sprang up, shouted, “This is a kiss of goodbye, you dog,” and launched a pair of size 10 wingtip shoes at the startled president. Bush reacted quickly, ducking the projectiles that whizzed by his head.

Eyewitnesses to the event (including the nimble president) most likely integrated a wide array of information with great speed and little effort. Relevant information included the controversial history of the war, knowledge that flying shoes are dangerous, knowledge of revenge scripts, and the concrete words and actions of the journalist. Most likely, perceivers immediately saw the unfolding events as intentional hostility directed toward the president. In addition to appreciating the intentional nature of the actions, perceivers may have spontaneously inferred motives related to “wanting to hurt,” revenge, and traits related to aggressiveness. Perceivers with different information, political orientations, or goals probably interpreted the action in different ways and drew different inferences from it (Ames, this issue; Gawronski, this issue; Molden, this issue; Newman, this issue; Trafimow, this issue). As time went on and the events began to sink in, perceivers thought about the events in a more logical, analytic manner. The next section examines this more deliberate type of processing.

Analytic, deliberate processing. Analytic thinking operates more slowly and sequentially, under conscious control (Gawronski, this issue; Morris & Mason, this issue; Pryor et al., 2004; Strack & Deutsch, 2004). The activated constructs and propositions from the earlier associative process are dealt with in deliberate fashion as the perceiver aims for a coherent view of events (Gawronski, this issue; Read & Monroe, this issue; Trafimow, this issue). Logical operations are brought into play, including the discounting and augmenting of various causal forces (Kelley, 1973). Once again—but with more refined logic to back it up—perceivers with different views, information, and agendas will all search for a coherent representation of the events. For instance, members of Bush’s security team perhaps viewed the shoe-throwing as an unprovoked attack by a terrorist or madman. Others, however, including an eyewitness Iraqi journalist who was overheard talking to a friend, justified

the act as “courageous.” The eyewitness journalist in this example can be seen as employing the discounting principle (Kelley, 1973) in an effort to exonerate the attacker. Apparently, he was implying that the situation (e.g., the U.S.-led war and Bush’s role in it) or the attackers motivation (e.g., revenge) justified the attack on the president. In his view, the attacker should be treated as a hero rather than as an aggressive criminal.

Each mode of processing just discussed—intuitive and analytic—is capable of providing the perceiver with information regarding the intentionality, motives, and traits of a target person. Next I consider the role of intuitive and analytic processing as it applies to each of these three types of inferences.

Intuitive and Analytic Perceptions of Intentionality

In my target article I did not specifically address the automaticity of intentionality judgments. Moreover, my main example focused on an analytic inference of intentionality: Could Aristotle’s sea captain—who confronted an oncoming storm—have done anything other than throw cargo overboard to save the ship? In the process, I drew on Malle and Knobe’s (1997) analysis, suggesting that perceivers would think deeply about intentionality and would consider such factors as the captain’s beliefs and skill. Analytic inferences of this type occur occasionally in everyday life, as evidenced by the quote at the beginning of this article. Likewise, consider the flying shoes incident. After the commotion died down, the eyewitnesses might have reflected on the intentionality of the attack (e.g., Did the attacker plan it out in advance? Did he purposely bring heavy, wingtips?). As described next, such analytic reasoning follows on the heels of earlier intuitive processing.

The comments on my target article suggest a variety of ways that intentionality can be inferred at an intuitive level (Gawronski, this issue; Hamilton et al., this issue; Molden, this issue; Morris & Mason, this issue). Smith and Miller (1983) provided an early example of the spontaneous nature of intentionality judgments. Their research participants were asked to read short sentences (e.g., “Andy slips an extra \$50 into his wife’s purse”) and then were asked whether the behavior was intended and whether the behavior was caused by something about the person versus something about the situation. Participants were much faster in answering questions about intentionality (2.4 sec), than questions about either person causality (3.4 sec) or situational causality (3.8 sec). Thus, it seems likely that perceivers implicitly notice intentionality (or its absence). But in everyday life, such inferences are often tacit and do not rise to the conscious level unless we are specifically asked about intentionality.

Morris and Mason (this issue) review relevant evidence of intuitive processing from social cognitive neuroscience (Lieberman, Gaunt, Gilbert, & Trope, 2002; Mitchell, 2008). They note that traditional attribution research has treated the identification of behavior (e.g., is the person being helpful?) as a single step. In contrast, social cognitive neuroscience research suggests that there are waves of progressive identification, that involve increasingly higher order brain structures, leading to increasingly sophisticated social understanding. When visual information is available, for instance, early processing identifies “what” the stimulus is, “where” it is, and “how” it is moving. The brain integrates such cues to differentiate between biological motion (i.e., typically intentional action) and mechanical motion. Likewise, the brain distinguishes between unintentional behavior (such as dropping an object) and goal-directed action. Finally, research from developmental psychology also converges on the idea that primitive modes of thought are sufficient to recognize human volition. For example, even children as young as 1½ years of age appear to understand goal concepts because they tend to imitate a failed action that they observed (Meltzoff, 1995).

Adult perceivers—equipped with sophisticated knowledge of the world and insight about human motivation—rely on a multiplicity of cues to make intuitive inferences about intentionality (Hamilton et al., this issue; Molden, this issue; Morris & Mason, this issue; Read & Monroe, this issue). Knowledge about the world includes knowing what kinds of situations typically induce unintentional behavior. Perceivers intuitively understand that hard constraints (such as an ocean wave that knocks a sailor into a crate) limit a person’s freedom of movement. That is, perceivers need not consciously deliberate about the hard versus soft nature of a constraint (although that can happen). Rather, perceivers can just “grasp” the nature of the constraint.

Perceivers also associate certain behavioral cues with unintentional behavior (e.g., fast, jerky movements or verbal expressions such as “Oops!”), allowing for intuitive inferences. In the absence of such cues (and the absence of hard constraints), it seems likely that the default assumption for perceivers is that the behavior is intentional. In a related vein, intuitive processing of intentionality seems especially likely when a target person’s actions match the perceiver’s expectations or stereotypes. Thus, perceivers may intuitively feel that when an enemy’s acts produce “collateral” damage in wartime (e.g., a missile strikes a house filled with civilians), the outcome was intended.

In this light, the perceiver’s intuitive evaluation of a target person’s behavior can be important (Zajonc, 1980). Two conflicting processes may be at work. On one hand, perceivers may tacitly assume that most people, most of the time, try to produce positive outcomes.

As a result of this lay theory of intentionality (Molden, this issue), positive acts (e.g., Melissa lent her notes to classmates) tend to be seen as more intentional than negative acts (e.g., Ben stole bread from the bakery). On the other hand, general affect can shape reactions to negative events, particularly those with moral implications (Haidt, 2001; Phillips & Knobe, this issue; Trafimow, Bromgard, Finlay, & Ketelaar, 2005). Perceivers who are disgusted or angered by a possible moral violation may be predisposed to make a variety of negative judgments that appear to justify that negative affect. Moral violations “seem wrong” and perceivers assume that the actor could and should have done something different. For example, Phillips and Knobe (this issue) describe a captain who tried to save his sinking ship by either tossing cargo overboard or tossing his wife overboard. Perceivers saw the moral violation (i.e., involving the wife) as less forced, implying that they perceived greater intentionality in that case. The interplay of lay theory and intuitive, morality-based affect provides fertile ground for future research.

Finally, when a target person’s behavior has low personal relevance to perceivers, perceivers are likely to process it intuitively, rather than expending scarce cognitive resources at the analytic level. In summary, rather than relying on complex criteria when inferring intentionality (Malle & Knobe, 1997), perceivers often rely on a variety of shortcuts to process action at an intuitive level.

Intuitive and Analytic Perceptions of Mindreading

As noted previously, both intuitive and analytic processing contribute to the perception that behavior is intentional versus unintentional. When action is perceived as intentional, the stage is set for inferences about mindreading (Malle, 2004; Malle & Hodges, 2005; Reeder & Trafimow, 2005). In other words, only intentional actions are explained in terms of beliefs, goals, and motives. This is not to say that mindreading necessarily occurs later, is slower, or is more complex than perceptions of intentionality. Much processing occurs in parallel, including some types of inferences about intentionality, motives, and traits. At the level of intuitive processing, Morris and Mason (this issue) draw an interesting distinction between goal-directed behavior and imputing motives. When a basketball player fakes to the left before driving right, a skillful opponent instantly grasps the goal-directedness of the action to anticipate the player’s direction of movement. Morris and Mason see this as more a matter of bodyreading than mindreading. Although their distinction is noteworthy, I view such bodyreading as a primitive form of motive imputation. As I noted earlier in discussing people’s perceptions of President Bush’s motives, people can attribute motives without

pondering the actual contents of another person's mind (Reeder et al., 2005).

Intuitive perception of motives is based on associations, stereotypes, and expectations. Unambiguous aspects of either a target person's behavior or the surrounding situation can activate a variety of associated constructs related to motive (Collins & Loftus, 1975; Gawronski, this issue; Morris & Mason, this issue; Read & Monroe, this issue; Trope, 1986). A straightforward implication is that a person on a street corner who unambiguously punches a bystander will be seen as wanting to hurt. But a less straightforward implication is that perceivers tend to assimilate the meaning of ambiguous cues in the direction of cues that are less ambiguous (Trope, 1986). For instance, someone who merely enters a boxing ring in trunks will spontaneously be seen as wanting to hurt. In the context of an unambiguous situation like a boxing ring, even the most ambiguous actions (such as inviting another person to move closer) may be seen in terms of hostile motivation.

When there are few contextual cues to help identify the motives underlying ambiguous behavior, the default process is often one of projection. That is, perceivers tend to spontaneously see their *own motives* in the other person (Ames, 2004; Kawada, Oettingen, Gollwitzer, & Bargh, 2004). For example, Kawada et al. reported that people tend to project their goals onto others automatically, without having to consciously place themselves in another person's shoes. A similar process might operate when people predict how a stranger will behave in the context of a game. For example, participants in a prisoner's dilemma game predicted that their partners would have similar motivations to their own (Kelley & Stahelski, 1970). Those with a competitive orientation expected a competitive partner, whereas those with a cooperative orientation expected a cooperative partner. Also, in the context of close relationships, individuals with intimacy goals tend to perceive their partners as also having intimacy goals, even when there is no correlation between own and partner's goals (Sanderson & Evans, 2001).

Perceivers also may rely on expectations or stereotypes to infer motives for ambiguous behavior. For example, when a man goes out to a bar, he tends to be seen as interested in casual sex, whereas a woman under similar circumstances might be seen as relatively more interested in finding a committed partner (Haselton & Buss, 2000). Stereotypes also affect the interpretation of ambiguously aggressive behavior. For example, after watching a target person appear to push someone, perceivers attributed more hostile motivation if the target was African American, rather than Caucasian (Duncan, 1976; Sagar & Schofield, 1980). In addition, perceivers who hold expectations based on already knowing a person will interpret the motives of the person based on that existing impression. For

example, a perceiver who believes that a politician, relative, or lover is dishonest may attribute negative motives when the target person engages in otherwise ambiguous acts. In this sense, preexisting trait inferences can determine motive attributions (Molden, this issue; Newman, this issue; Trafimow, this issue).

But when do perceivers project and when do they use stereotypes (or expectations) to infer motives? Ames (this issue) suggests that people tend to project motives when they feel similar to another person. In one of his studies, perceivers first indicated how similar they felt to fraternity members (Ames, 2004). Later, in a different context, they read about a fraternity member who met a woman at a dance and asked her to leave with him. The story was ambiguous such that the man could be seen as either motivated to have casual sex or wanting to get to know her. If participants felt similar to fraternity members, they were more likely to project their own motives onto the character in the story (e.g., those who had an interest in casual sex tended to see that same motive in the character). In sum, there are a variety of circumstances in which mindreading appears to be intuitive or spontaneous.

But mindreading can be more analytic, of course. In fact, researchers have proposed dual process models whereby the input of intuitive processing gets transformed as analytic processing comes into play (Epley, Morewedge, & Keysar, 2004; Reeder & Trafimow, 2005; Van Boven & Loewenstein, 2003). Often, initial reactions are egocentric, relying on simple projection. Imagine the reaction of a rabid sports fan who just learned that his favorite team qualified for a playoff game. His first impulse might be to call his romantic partner, with the thought that the partner would appreciate the good news. But a little reflection by the fan might lead to the sober realization that his partner typically hates sports and would not relish a weekend planned around the playoffs. Thus, egocentric thinking can be "corrected" as analytic processing takes over. This is not to say that analytic processing is always more accurate (Ames, this issue) than intuitive processing. People can be mistaken in the assumptions that get applied at the analytic stage. For instance, the romantic partner mentioned above might actually be looking forward to this particular playoff game.

Analytic processing involves a conscious, deliberate attempt to increase understanding. Such in-depth processing is more likely when a target person's behavior holds some personal relevance to the perceiver. When this occurs, the perceiver aims for a coherent, logical representation of the target person's goals in the current context. Three particularly useful tools in this regard are covariation detection, discounting, and constraint-satisfaction (Gawronski, this issue; Read & Monroe, this issue; Reeder & Trafimow, 2005). In one form or another, covariation principles underlie early models of person perception proposed by Heider (1958), Jones

and Davis (1965), and Kelley (1967, 1973). In covariation reasoning, perceivers look for a motive that covaries over time with the target's actions. For instance, if the governor gives lucrative state jobs to people who contribute to his or her campaign coffers, but denies such opportunities to others, we may infer that the governor's motive is to enrich him or herself, rather than to appoint the most qualified people.

Kelley's (1973) discounting principle is a foundation of theories of dispositional inference (Gawronski, this issue; Gilbert, 1998). Accordingly to this principle, perceivers should discount a given motive if there are other potential motives to explain a person's behavior. For example, imagine that perceivers learn about a student who helped a professor stack books in her office. They may discount a helpful motive if they learn that the student had an ulterior motive (e.g., to obtain a high grade) for helping the professor. Notice that discounting, unlike the covariation principle, can be applied in the case where the perceiver knows only about a single behavior by the target and has not witnessed numerous behaviors over time.

Finally, perceivers may actively seek to reduce the inconsistency between momentarily activated constructs in a manner guided by constraint-satisfaction principles (Gawronski, this issue; Read & Monroe, this issue; Tafilimow, this issue). Although constraint-satisfaction is often viewed as an intuitive process, downstream processing seems to follow similar rules of consistency resolution. The advantage of these principles is their explanatory breadth (Read & Markus-Newhall, 1993). For example, imagine that you are single and hoping to establish a new close relationship with a partner who just "stood you up" for dinner. If your partner has been working late with an attractive assistant and sometimes calls the assistant in your presence, you might begin to see a pattern in these events: In the words of a recent movie, your partner is "just not that into you"! This search for a coherent story is the essence of constraint-satisfaction (Read & Miller, 2005; Thagard, 1996). Heider (1958, p. 51), for example, noted that people look for a motive that integrates or reconciles all of the known facts about the person.

Like constraint-satisfaction, covariation detection and discounting may be automatized under some circumstances. Perceivers who gain expertise in certain domains of social perception might learn to employ these principles in a more intuitive way (Smith & Lerner, 1986; Vonk, 1998). For instance, people may spontaneously use these processes to spot another person's ulterior motives or cheating behavior (Cosmides, 1989).

Intuitive and Analytic Perceptions of Dispositions

MIM holds that perceivers draw a variety of inferences about an impression target, both intuitively and

analytically. At an intuitive level, we have already seen that perceivers tend to make inferences about whether behavior was intentional and can also engage in aspects of mindreading. Likewise, perceivers tend to intuitively infer traitlike constructs.

Indeed, given the close associative bonds between constructs like motives and traits (Collins & Loftus, 1975; Gawronski, this issue; Read et al., 1990), at least one aspect of processing is similar for each. That is, perceivers can infer both motives and traits based on associations and stereotypes. In the case of spontaneous trait inferences (Newman, this issue; Uleman et al., 2008), perceivers tend to infer traits that capture the gist or general meaning of a behavioral description. For example, upon reading that the secretary solved the mystery novel halfway through the book, perceivers may spontaneously infer traits like "intelligent" or "clever." In similar fashion, perceivers who watch a videotape of a young woman fidgeting while she is asked embarrassing questions (Gilbert, Pelham, & Krull, 1988) may intuitively infer a trait like "anxiety" (Morris & Mason, this issue). In this latter example, multiple cues are processed with minimal cognitive effort, including aspects of the situation, the observed behavior, and possibly stereotypical expectations about women. Reflecting the spirit of MIM, there are also multiple possible outputs of this process, including spontaneous inferences related to situations, (a lack of) intentionality, as well as traits.

Does spontaneous trait inference differ for intentional and unintentional acts (Newman, this issue)? A consideration of the underlying process—association—suggests a negative answer to the question. Perceivers are as likely to form spontaneous associations to intentional action (e.g., solving a mystery) as to unintentional action (e.g., inferring that a fidgeting person is anxious). Thus, the intentionality of behavior may be irrelevant to intuitive inferences about traits.

At the level of analytic processing, MIM predicts a clearer divergence between trait inferences for intentional and unintentional acts (Malle, 2004; Morris & Mason, this issue; Reeder et al., 2002). Intentional acts are typically explained in terms of motives. When traits are inferred for intentional action, the traits tend to "fit" with those motives (Asch, 1946; Gawronski, this issue; Read & Monroe, this issue; Roese & Morris, 1999; Tafilimow, this issue). For instance, trait inferences of ability are often reconciled with inferences about motivation (Heider, 1958; Reeder, Hesson-McInnis, Krohse, & Scialabba, 2001). Thus, when a person performs poorly in an athletic contest after receiving a bribe, perceivers may assume that the person lacked motivation (to perform at a higher level) and assume that the person possesses relatively high ability (Reeder et al., 2001). Because information about the situation (i.e., the bribe) is instrumental to inferring motivation,

MIM suggests that perceivers are often quite attentive to it.

By addressing the process whereby inferred motives can inform trait inference, MIM implies a number of novel predictions. For example, traditional models of dispositional inference assume that trait inferences will be discounted when situational forces encourage a particular type of behavior. Accordingly, if the situation encouraged a person to be aggressive, perceivers should not see the person as particularly immoral. In contrast, MIM suggests that trait inferences of morality will be based on the particular motives that are inferred for the aggression. In line with MIM, perceivers attribute higher levels of morality when aggression is motivated by positive motives (such as revenge for a previous insult) compared to when it is motivated by negative motives (such as wanting to win an athletic contest at any cost; Reeder et al., 2002; Reeder et al., 2008).

In contrast to intentional acts, unintended acts are explained in terms of causal reasoning that does not involve motives. For instance, consider the case where a soccer player attempts to kick a ball into a stiff wind (Reeder et al., 2001). A short kick may be attributed to the inhibitory effect of the wind and, as a result, the soccer player may be seen as having relatively high ability. In this example, perceivers combine their knowledge about the world (e.g., the action of the wind) with an inference about the player's ability. Finally, Read and Monroe (this issue) argue persuasively that such causal reasoning is typically concrete (e.g., focusing on the wind), as opposed to being abstract (e.g., focusing on abstract situational vs. dispositional causes). Yet direct empirical evidence on this issue is sparse—as is the case with many other issues raised by the commentators.

Conclusion

In this revised version of MIM, the social perceiver possesses an array of tools for mindreading and inferring traits. Moreover, the perceiver tends to employ these tools in a flexible fashion (Ames, 2004), depending on the circumstances and needs of the perceiver. Rather than following a rigid sequence, inferences about situations, intentionality, mindreading, and traits may occur at either an intuitive or analytic level. Much processing occurs in parallel. Thus, the revision focuses on the kinds of information that perceivers infer under different circumstances and the role of automaticity within that process.

With regard to what perceivers infer, it is important to note the close cognitive associations between motives and traits. Motive inferences can increase the activation of trait inferences and vice versa. Thus, there is no single sequence governing these inferences. But motives and traits do differ. Motives refer to men-

tal states and inferences about such states often show low consensus among observers. In addition, we may be more prone to engage in simulation and projection when mindreading, as opposed to inferring traits. This article also examined the limits of mindreading, concluding that perceivers may be more interested in motives under some circumstances and in traits under other circumstances.

The more important addition to MIM concerns the greater specification of automaticity in the model. Inferences about intentionality, mindreading, and traits can take different routes. For instance, although perceivers can reason in sophisticated ways about intentionality (Malle & Knobe, 1997), a variety of shortcuts are typically taken. Unless people are asked directly about intentionality, they often rely on these shortcuts to gain an intuitive, tacit grasp of whether behavior was intentional or unintentional.

When action is perceived as intentional, a variety of mindreading tools can come into play. Based on stereotypes, for instance, perceivers may intuitively infer that a poorly dressed man standing in the cold outside a restaurant is hungry. In this respect, spontaneous inferences of motive are similar to those documented in the literature on spontaneous trait inferences (Uleman et al., 2008). People may also effortlessly project their own motives onto another person, particularly when they feel similar to that person. If the target person is especially relevant to the perceiver, more analytic processing may be initiated. Perceivers may then rely on mindreading techniques such as covariation detection, discounting, and constraint-satisfaction.

As previously noted, traits can be inferred spontaneously from even brief descriptions of behavior (Gilbert et al., 1988; Uleman et al., 2008). Because such spontaneous processing is based on associations, the intentionality of behavior is not particularly relevant in this case. But when more analytic processing is engaged, a crucial difference emerges for acts seen as intentional versus unintentional. Intentional acts are explained in terms of motives. Consequently, the motives that underlie intentional behavior tend to shape traits inferences that are drawn from it. In contrast, unintentional acts are explained in terms of more mechanical causes. Finally, although MIM suggests a logical process whereby trait attribution is informed by inferences about intentionality and motives, much processing can occur in parallel.

In its new form, MIM extends the reach of social perception models in a number of directions. The model addresses inferences of intentionality and mindreading, in addition to inferences about traits. The processes underlying these inferences—intuitive and analytic—are more clearly specified. In doing so, the model offers testable predictions in a variety of domains. Such an ambitious extension of the theory would not have been possible without the generous

and insightful suggestions of the commentators. Their comments both contributed to the development of MIM and stand alone as sources of inspiration for future research on social perception.

Note

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