Organizational Behavior and Human Decision Processes 117 (2012) 96–110

Contents lists available at SciVerse ScienceDirect

Organizational Behavior and Human Decision Processes

journal homepage: www.elsevier.com/locate/obhdp

Mind-reading in strategic interaction: The impact of perceived similarity on projection and stereotyping

Daniel R. Ames [a,*], Elke U. Weber [b], Xi Zou [c]

[a] Management Division, Columbia Business School, Columbia University, United States
[b] Department of Psychology and Management Division, Columbia Business School, Columbia University, United States
[c] Organisational Behaviour, London Business School, UK

ARTICLE INFO

Article history:
Received 29 September 2009
Accepted 29 July 2011
Available online 30 August 2011
Accepted by Maurice Schweitzer

Keywords:
Social projection
Stereotyping
Perceived similarity
Social dilemma
Cooperation
Competition
False consensus
Perceptual dilemma

ABSTRACT

In social dilemmas, negotiations, and other forms of strategic interaction, mind-reading—intuiting another party's preferences and intentions—has an important impact on an actor's own behavior. In this paper, we present a model of how perceivers shift between social projection (using one's own mental states to intuit a counterpart's mental states) and stereotyping (using general assumptions about a group to intuit a counterpart's mental states). Study 1 extends prior work on perceptual dilemmas in arms races, examining Americans' perceptions of Chinese attitudes toward military escalation. Study 2 adapts a prisoner's dilemma, pairing participants with outgroup targets. Study 3 employs an ultimatum game, asking male and female participants to make judgments about opposite sex partners. Study 4 manipulates perceived similarity as well as counterpart stereotype in a principal–agent context. Across the studies, we find evidence for our central prediction: higher levels of perceived similarity are associated with increased projection and reduced stereotyping.

> "[The Kaiser] said France never ceased provoking him. As a result of [the French] attitude, war with France was not only inevitable; it was near at hand. The French press treated Germany with malice, the Three-Year Law was a deliberately hostile act, and all France was moved by an unquenchable thirst for *revanche*. Trying to stem the flow, [Belgium's King] Albert said he knew the French better; he visited France every year, and he could assure the Kaiser they were not aggressive but sincerely desired peace. In vain; the Kaiser kept insisting war was inevitable." *The Guns of August*, Barbara W. Tuchman

Introduction

Some of the costliest conflicts in human history—including the millions of deaths in World War I and the billions of dollars and rubles spent in the Cold War—were fueled by assumptions, such as the Kaiser's, about a potential adversary's desires and intentions. Whether in the run-up to armed conflict between nations or one-on-one business negotiation, strategic interaction revolves around each side's assumptions, right or wrong, about what the other side is thinking: what a rival believes, what a competitor wants, what an agent intends to do. These assumptions about others matter because they impact an actor's own choice of behavior. Countries in conflict arm or disarm based on the intentions they ascribe to their potential enemies. Negotiators make openings, offer counterproposals, and walk away from the table based on their reading of the other party's mind.

While the importance of such "mind-reading"[1] in strategic interaction is increasingly recognized (e.g., Epley, Caruso, & Bazerman, 2006; McCabe, Rigdon, & Smith, 2003), models diverge on how it unfolds. Some invoke social projection and perspective-taking, portraying people as generally assuming that others share their own intentions, or the intentions they themselves would have if they were in their partner's shoes. Other accounts suggest that people often overlook commonalities and rely instead on exaggerated or baseless stereotypes of social groups (e.g., bankers are ruthless, red-heads are temperamental). Still other models imply that most people assume their counterparts are, by and large, rational and

* Corresponding author. Address: Columbia Business School, 707 Uris Hall, 3022 Broadway, New York, NY 10027-6902, United States. Fax: +1 212 854 3778.
E-mail address: da358@columbia.edu (D.R. Ames).

[1] Our quotation marks here clarify that we use this term metaphorically. We omit quotation marks for the remainder of the paper, following other scholars' use of the term *mind-reading* and its variants to signify the everyday process of drawing inferences about others' mental states, including preferences, motives, and intentions (e.g., Ames & Mason, in press; Apperly, 2010; Ickes, 2003; Singer & Fehr, 2005). Note that mind-reading does not necessarily imply accurate judgments, just inferences about what others think, want, and feel.

0749-5978/$ - see front matter © 2011 Elsevier Inc. All rights reserved.
doi:10.1016/j.obhdp.2011.07.007

self-interested, which is a global stereotype of a sort—a folk rational-choice theory. Each of these approaches likely captures part of the truth, but these accounts remain relatively unconnected and little evidence has been offered to account for how perceivers might move between these inferential strategies in strategic contexts. When and why might a perceiver turn to projection in one case, yet stereotype in another? If scholars cannot answer this question, their models for predicting and explaining what happens in strategic interaction will remain incomplete.

In this paper, we take steps toward an integrated model of mental state inferences in strategic judgment. Our goal is to illuminate how perceivers use social projection and stereotyping to attempt to read counterparts' minds—and to harness individual differences, such as prior expectations about similarity, and situational factors, such as new information about similarity or feedback about the accuracy of their predictions, to predict how perceivers move between these routes. Our findings provide a reconciliation between seemingly-divergent past results and yield a more complete explanation for how mind-reading unfolds in strategic contexts.

Background

We begin by clarifying what we mean by "mind-reading in strategic interaction." By *strategic interaction*, we mean those episodes in which individuals or groups coordinate their own behavior with others' behavior in order to obtain outcomes that depend on both parties' actions, especially in cases of perceived threats, competition, or scarce resources. This includes a wide range of social dilemma and game situations (see, e.g., Camerer, 2003; Komorita & Parks, 1994) and also applies to interpersonal and intergroup negotiations and conflict as well as principal–agent relations (Eisenhardt, 1989). In this context, *mind-reading* refers to inferences, right or wrong, that a party makes about another party's beliefs, desires, or intentions (e.g., "She wants what's best for us both," "He doesn't care about being fair"). Such mental states are ascribed not only to individuals, but often to groups as well (e.g., "They want to take advantage of us"). Mind-reading is distinct from, though surely related to, other kinds of judgments that may occur in a strategic context, including the ascription of general dispositions to another party (e.g., "She's an aggressive person") and the prediction of others' behaviors (e.g., "He will lie to us").

While some debate remains, many scholars believe that inferences about others' mental states are an important part of strategic interaction and a precursor to strategic behavior (e.g., McCabe et al., 2003). Recent work gauging neural activity seems consistent with the notion that mentalizing others is a natural and perhaps inevitable component of strategic interaction (e.g., Bhatt & Camerer, 2005; Singer & Fehr, 2005). Moreover, scholars in various traditions have suggested that *misreading* minds is a common component of strategic blunders (e.g., Pinkley, Griffith, & Northcraft, 1995; Plous, 1993). We proceed here with the assumption that mind-reading matters—that an important part of strategic interaction involves minds attempting to model other minds. We focus our current efforts on trying to explain how this process unfolds in strategic contexts.

How do people read minds?

Reading minds in strategic contexts is a special case of reading minds in general. Numerous accounts have been offered across a variety of disciplines for how everyday mind-reading emerges (e.g., Apperly, 2010; Malle & Hodges, 2005). We briefly review a relevant set of these accounts in the sections that follow.

Evidence

Perceivers are adept at inferring an actor's intentions and goals on the basis of evidence ranging from simple body movements (e.g., Meltzoff & Brooks, 2001) to facial expressions (e.g., Ames & Johar, 2009) to more elaborate sequences of behavior that converge on desired outcomes (e.g., Heider, 1958; Malle, 1999). In the domain of social dilemmas, counterpart behavior can undoubtedly serve as evidence of motives. Kelley and Stahelski (1970b), for instance, showed that dilemma players inferred counterpart motives from initial moves (see also Maki & McClintock, 1983). Other scholars have likewise argued that early choices in sequential games can have an intention-signaling effect on subsequent subgames (e.g., Kohlberg & Mertens, 1986; McCabe et al., 2003). Along with observed action, perceivers may rely on other varieties of evidence in reading counterparts' minds, including information about the target's personality and character (e.g., De Bruin & Van Lange, 1999; Van Lange & Kuhlman, 1990) and communication offered by the target (e.g., Komorita & Parks, 1994; Kopelman, Weber, & Messick, 2002; Messick & Brewer, 1983; Thompson, 1991).

There is little doubt that in strategic interaction most parties scrutinize others' behavior carefully and use whatever pieces of evidence they can acquire that seem to signal (validly or not) others' intentions. Yet in many cases, especially in the early stages of an interaction, evidence is slim. This does not halt the wheels of mind-reading, however; in such cases, perceivers arguably reach for a different set of inferential tools.

Projection and perspective-taking

More than half a century of research has documented people's willingness to assume—often to an unwarranted degree—that others share their own desires and intentions (e.g., Katz & Allport, 1931; Ross, Greene, & House, 1977; see Krueger, 2000 for a review). In the domain of strategic interaction, Kelley and Stahelski (1970c) showed that competitive players in social dilemmas tended to project their competitive goals onto others, regardless of whether those partners described themselves as cooperative or competitive. Van Lange (1992) extended this work, finding that both cooperative and competitive players projected. More recently, Krueger and Acevedo (2005) have invoked social projection to argue that many players in dilemmas expect reciprocity; they have also shown that reciprocity expectations can have a substantial effect on behavioral choices (Acevedo & Krueger, 2005). In research on negotiations, Bottom and Paese (1997) demonstrated that in the absence of stereotypic or individuating information, negotiators tend to assume that other parties shared their own preferences, an inference leading to "fixed pie" assumptions and suboptimal settlements.

A more effortful and elaborate version of this transposition from self to other is some form of perspective-taking in which a person imagines him or herself in another person's situation, intuiting what the other party would think, want, or feel in that circumstance (e.g., Davis, Conklin, Smith, & Luce, 1996; Van Boven, Loewenstein, & Dunning, 2005). Epley et al. (2006) found that perspective-taking shaped strategic behavior: when individuals considered their counterpart's perspective in a commons dilemma, they became *more* competitive, having imagined that their partners might act selfishly to pursue their own interests. Galinsky, Maddux, Gilin, and White (2008) have linked perspective-taking to negotiation behavior and outcomes, showing that perspective-takers are better able to discover hidden agreements and to claim value. In sum, another route to inferring the mental states of a strategic counterpart is to use the self, through projection or perspective taking, as a template for intuiting others' desires, preferences, and intentions.

Stereotyping

When direct evidence is unclear or unavailable, perceivers may turn to themselves as a source for mind-reading. But there is another considerable body of scholarship that points to a different inferential source: stereotypes. For better or worse, stereotypes can and often do shape mind-reading, as illustrated by Sagar and Schofield's (1980) classic study of how school-aged American children viewed ambiguous shoves by black and white actors. Both black and white children tended to see shoves by black actors as flowing from aggressive intentions and physically-identical shoves by white actors as joking behavior. Examining negotiator judgments, Bottom and Paese (1997) suggested that negotiators are often guided by stereotypes in their assumptions about partner preferences, with accurate stereotypes leading to mutually beneficial integrative bargaining. Elsewhere, Ames (2004a) found that observers of negotiations are influenced by their stereotypes of the negotiators' groups (e.g., investment bankers) in judgments of cooperative and competitive intentions. A large and active tradition of work has highlighted the role of gender stereotypes in judgments of negotiators (see Kray and Thompson (2005) for a review). In research on social dilemmas, Plous' (e.g., 1993) account of perceptual dilemmas implies a role for inaccurate stereotypes: wrongly characterizing counterparts as aggressive leads to misestimation of their preferences for mutually-beneficial outcomes. Overall, research indicates that stereotypes, whether right or wrong, are often employed to infer intentions of other parties in strategic interaction.

An integrated model of mental state inferences

Where do these models leave us? We grant that interacting parties in strategic contexts readily use evidence (e.g., initial hostility) to form and inform their views of counterparts, but we focus here on cases in which no behavioral evidence is available. The foregoing section suggests several other possibilities. A "pervasive projection" view would hold that social projection is a fundamental egocentric aspect of interpersonal judgment—perceivers cannot help but anchor on themselves. A "stubborn stereotyping" view would hold that stereotype activation and perhaps application happen swiftly and automatically—perceivers cannot help but see others through the lens of relevant stereotypes. Such models predict main effects but say nothing about how perceivers would choose between these routes. We contend that *both* of these inferential routes play some role at different times and that they may even supplant one other as alternative ways for reading minds—but what conditions govern which method is employed?

Work on the role of mental state inferences in person and group perception (e.g., Ames, 2004a, 2004b) suggests an answer. According to this similarity-contingency model, when evidence is missing or ambiguous, perceptions of general similarity play a moderating role in determining how stereotyping and projection are used in mind-reading. When a perceiver initially views herself as similar to a target, she tends to shift away from stereotyping and rely more heavily on the self as source of judgment—which is to say, social projection. When she views herself as different from a target, she tends to set social projection aside, looking instead to stereotypes as a source of judgment.

Evidence from a variety of paradigms supports this model of shifting inferential sources. In judgments of individuals as well as groups, Ames (2004a, 2004b) has shown that naturally occurring individual differences in perceived similarity predict projection and stereotyping. Moreover, manipulations of similarity have revealed the expected effects: perceivers led to focus on similarities with targets have shown higher levels of projection and lower levels of stereotyping than those led to focus on differences. Across these studies, projection and stereotyping have displayed something of a "hydraulic" effect: the more perceivers appear to rely on one inferential route, the less they tend to rely on the other. Importantly, this work has shown that while *perceived similarity* appears to moderate projection and stereotyping, these intuitions are not closely related to measures of *actual similarity*. Perceptions of general similarity seem fallible and malleable, susceptible to over-generalization from limited evidence of similarities or differences and to focus and salience effects (e.g., focusing on similarities to a target tends to increase the subjective sense of general similarity).

Other recent evidence points to similar moderators of projection, such as Clement and Krueger's (2002) work suggesting limited projection to outgroups (see also Rothbart & Hallmark, 1988) and Jones' (2004) work on perceived social distance. Neuroimaging research by Mitchell, Macrae, and Banaji (e.g., 2006) indicates that neural regions associated with self-referential processing show more activation when perceivers are judging seemingly similar, rather than dissimilar, others. In short, mounting evidence suggests that, when faced with a lack of direct evidence, mind-readers shift in predictable ways between stereotyping and projection in inferring others' mental states (for further discussion, see Ames, 2005; Ames & Mason, in press). However, these shifts have not been studied in the domain of strategic interaction. It is possible that the inferential "rules" are different in strategic contexts. For instance, competitive relationships might be a special circumstance that stunts projection, minimizes perceived similarity, or simply interrupts the relationship between projection and similarity (Toma, Yzerbyt, & Corneille, 2010). In this paper we test our belief that the similarity contingency model applies to strategic interactions; we think the widespread importance of strategic situations requires that we examine this evidence. The primary goal of the present paper is to harness this model to explain mind-reading in strategic interaction.

Predictions and plan of study

Our central prediction is that perceived similarity will be positively associated with social projection, and negatively associated with stereotyping, in gauging counterparts' mental states in strategic interactions. Our research tested this prediction in four studies of strategic interaction. In Study 1, we built on Plous' (1985, 1993) perceptual dilemma work in the context of a real-world conflict by examining American assumptions about Chinese attitudes toward military activity in and around Taiwan. In Study 2, we shifted to actual behavior in an experimental dilemma, building on Kelley and Stahelski's (1970c) two-person prisoner's dilemma game to test stereotyping and projection effects. In Study 3, we manipulated perceived similarity with an opposite-sex partner in an ultimatum game. We relied on idiosyncratic gender stereotypes and tested whether similarity affected projection and stereotyping. In Study 4, we manipulated perceived similarity as well as counterpart stereotype in a principal–agent context. Using a design featuring feedback between two rounds of judgments, we sought both between- and within-participant evidence of shifts between stereotyping and projection. If our predictions are supported across these studies, our findings would be the first evidence we know of to address the interface between two mind-reading strategies in strategic contexts, thereby expanding our ability to account for how interacting parties judge one another and, ultimately, to account for the genesis of competitive and cooperative behavior.

Study 1

In Study 1, we examined American perceptions of US and Chinese attitudes about military activity in and around Taiwan and

the South and East China Seas. In recent years, the area has been a source of tension in US–China relations, prompting fears that a conflict could emerge that might escalate and potentially pull the two nations into war. We suspected that the situation could engender a perceptual dilemma akin to Plous' (1993) work on the Cold War arms race: American perceivers might themselves most prefer mutual disarmament in the region while expecting the Chinese most desire unilateral (China-only) armament. Such a pattern of mind-reading would, on balance, suggest reliance on a stereotype of China as militarily aggressive rather than reliance on social projection. However, we expected use of these inferential sources to shift depending on perceived similarity: those who saw themselves as more similar to Chinese would project more and stereotype less than those who saw themselves as dissimilar.

Method

Participants

Three hundred and twenty-six adult Americans residing in the United States completed the materials through an internet-based survey. Participants were recruited from a wide variety of online discussion groups (focusing on individuals discussing news and current events at Yahoo.com, such as the groups "All things currently," "Global affairs," and "Letters to the editor") with posted messages encouraging volunteers to complete a survey about US–Chinese relations. Average age was 38.8 (SD = 13.1); 118 (36.2%) identified themselves as women. Two hundred and thirty-five (72%) identified themselves as Caucasian; 10 (3%) identified themselves as African American, 9 (3%) identified themselves as Asian American, 4 (1%) identified themselves as Latino/Hispanic. Just over 30% indicated they were slightly or very conservative politically; just over 35% indicated they were slightly or very liberal.

Materials

Participants began the survey by indicating perceived similarity to Chinese ("I think I'm similar to the average Chinese citizen") on a scale from 1 ("Strongly disagree") to 6 ("Strongly agree"). Using the same scale, participants responded to two items meant to gauge general stereotypes of China as dominance-seeking and combative ("Most citizens of China wish their country would be the dominant superpower in the world" and "The citizens of China tend to be reasonable people who want to get along with other nations," with this later item reverse-scored). Participants were then asked to consider the potential dilemma of military activity between the US and China:

There is an increasing level of military activity around Taiwan and in the South and East China seas. This has created a kind of "arms race" with military presence that runs the risk of escalating into conflict. There are many possible outcomes for this situation, but we want you to think about just four simplified outcomes:

- Both the United States and China increase their military activity in the South/East China Seas.
- The United States increases its military activity while China decreases its military activity.
- China increases its military activity while the United States decreases its military activity.
- Both the United States and China decrease their military activity.

Hereafter, these will be referred to as the mutual increase, US increase, China increase, and mutual decrease options. Participants rated these four outcomes two times: first indicating their own preference for each and second indicating their assumptions about the preferences of the average Chinese citizen. Following Plous (1985), a 21-point scale was used, ranging from "Worst possible outcome" (−10) to "Best imaginable outcome" (+10).

Results

Perceptual dilemma

As expected, the pattern of mean ratings across these outcomes was consistent with Plous' (e.g., 1985) prior work on perceptual dilemmas. On average, respondents said they would clearly favor mutual decreases (5.24, SD = 5.46) to all other outcomes, including US unilateral increases (−.64, SD = 6.60, $t(322) = 10.29$, $p < .01$), mutual increases (−5.42, SD = 4.66, $t(322) = 21.66$, $p < .01$), and Chinese unilateral increases (−6.81, SD = 3.99, $t(322) = 32.73$, $p < .01$). Respondents assumed the average Chinese would prefer Chinese unilateral increases (4.39, SD = 5.40) to all other outcomes, including mutual disarmament (2.00, SD = 5.69, $t(311) = 4.85$, $p < .01$), mutual increases (−4.08, SD = 4.66, $t(311) = 22.79$, $p < .01$), and US unilateral increases (−7.29, SD = 3.89, $t(311) = 27.025$, $p < .01$). This overall pattern resembles a perceptual dilemma in which one professes to favor mutual cooperation yet assumes one's counterpart favors unilateral dominance.

Moderated projection and stereotyping

We computed a measure of "escalatory preferences" from participants' responses, by first taking the z-score of each participants' rating for the mutual decrease option (compared to the mean and standard deviation of their ratings to all four responses) and then reversing this value. In other words, if a participant assigned a high personal rating to mutual decreases compared to the other three outcomes (mutual increase, US increase, China increase), she would have a low score for "self escalatory preferences." If a participant assumed that the average Chinese citizen would assign a low rating to mutual decreases compared to the other three outcomes, he would have a high score for "assumed Chinese escalatory preferences." Means are shown in Table 1.

A first question is whether there was evidence for main effects of projection and stereotyping in participants' assumptions for Chinese escalatory preferences. Indeed, self escalatory preferences were significantly positively correlated with assumed Chinese escalatory preferences (see Table 1 for correlations), consistent with a main effect of projection. In addition, the average negative stereotype rating was significantly positively correlated with assumed Chinese escalatory preferences, consistent with a main effect of stereotyping.

This pattern of results suggests that participants may have relied on both themselves and stereotypes in gauging Chinese preferences. The central prediction of the present paper is that the reliance on these inferential strategies would be governed by perceived similarity. To test for this pattern of moderation, we conducted a set of multiple regressions (see Table 2 for results). In a first model, we predicted assumed Chinese escalatory preferences with self preferences and negative stereotype. In a second model, we added perceived similarity and two interaction terms as predictors: self preferences × perceived similarity and negative stereotype × perceived similarity. Our account predicts that this first

Table 1
Means and correlations between constructs, Study 1.

	Mean	SD	1	2	3
1. Similarity	2.10	1.21	–		
2. Stereotype	3.72	1.08	−.28**	–	
3. Self preferences	−.95	.69	−.12*	.31**	–
4. Assumed Chinese preferences	−.43	.68	−.19**	.27**	.44**

* Two-tailed $p < .05$.
** Two-tailed $p < .01$.

Table 2
Models of assumed Chinese escalatory preferences, Study 1.

Model	Variable	Standardized coefficients		Model		
		β	t	R^2	ΔR^2	F
1	Self preferences	.38	7.04**	.462	.214	39.83**
	Stereotype	.17	3.07**			
2	Self preferences	.19	2.01*	.499	.035	4.53**
	Stereotype	.34	3.67**			
	Similarity	.38	2.28*			
	Similarity * Self preferences	.24	2.08*			
	Similarity * Stereotype	−.37	2.58**			

* Two-tailed $p < .05$.

interaction term should be significant and positive (i.e., projection increases with perceived similarity) and the second interaction term should be significant and negative (i.e., stereotyping declines with perceived similarity).

As shown in Table 2, the regression results were consistent with these predictions. The self preferences × perceived similarity interaction term was significant and positive and the negative stereotype × perceived similarity interaction was significant and negative. To clarify the pattern of the interaction, we plotted slopes based on these regression models. The left panel in Fig. 1 shows the relationship between self preferences and assumed Chinese preferences, which we take as a measure of projection (based on our regression Model 2, controlling for the effect of stereotype). As expected, participants one standard deviation above the mean in perceived similarity showed a positive relationship between own preferences and assumed Chinese preferences. Participants one standard deviation below the mean showed essentially no relationship between own preferences and assumed Chinese preferences. The right panel of Fig. 1 shows the relationship between stereotype and assumed Chinese preferences, which we take as a measure of stereotyping (based on our regression Model 2, controlling for the effect of self preferences). Participants one standard deviation below the mean in perceived similarity showed a positive relationship between stereotype and assumed Chinese preferences. Participants one standard deviation above the mean showed essentially no relationship.

Discussion

In Study 1, we found a pattern of judgments resembling a perceptual dilemma (Plous, 1993): American respondents said they most preferred mutual disarmament with China in the South and East China Seas region but assumed Chinese would most prefer unilateral (China-only) armament. However, the inferential routes participants took to infer Chinese preferences appeared to vary in ways consistent with our account. Participants higher in perceived similarity showed greater evidence of projection whereas participants lower in perceived similarity showed greater evidence of stereotyping.

Study 2

Study 1 provided support for our predictions about mind-reading, but did not feature choices or behavior. In Study 2, we sought to extend these results with a controlled experimental game, allowing us to measure mind-reading in an interaction where participants were making behavioral choices and experiencing personal outcomes.

Participants in Study 2 were online adults who played a two-person prisoner's dilemma based on Kelley and Stahelski's (1970a) design. Participants were told their responses would be matched with those from a Master's of Business Administration (MBA) student. The MBA target was chosen as a group about which people have varying positive and negative stereotypes and assumptions about similarity (see Ames, 2004b). We predicted that participants who perceived themselves to be more similar to MBA students would engage in greater projection and less stereotyping.

Method

Participants

Seventy-nine respondents (46 women; average age 37.2, $SD = 13.5$) were recruited to complete Study 2 through messages to a wide variety of online discussion groups. Postings invited adult American respondents to complete a survey on "social interactions" with a chance to win cash prizes and gift certificates to online retailers.

Materials

Participants were instructed that they would be playing the "Choice game," randomly paired electronically with "Master's of Business Administration students (MBA students) at Columbia University in New York." Participants continued by rating a similarity item ("I think I'm very similar to most Columbia MBA students") and competitive stereotype items ("I believe that most Columbia MBA students will take advantage of others if they can" and "I think that most Columbia MBA students are willing to sacrifice their self-interest to help other people," with this latter item reversed-scored) on a scale ranging from 1 ("Strongly

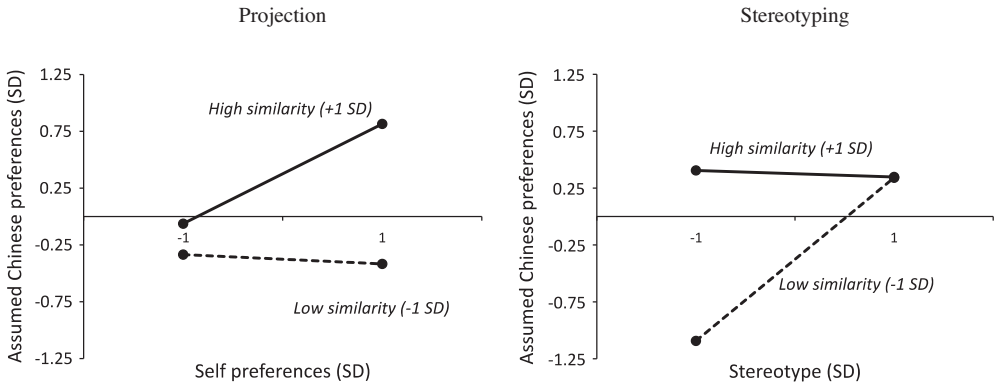

Fig. 1. Projection and stereotyping in assumptions about Chinese escalatory preferences as a function of perceived similarity, Study 1. *Note*: Left panel shows relationship between self preferences and assumed Chinese preferences for low (−1 *SD*) and high (+1 *SD*) similarity. Right panel shows relationship between stereotype and assumed Chinese preferences for low (−1) and high (+1) similarity.

disagree") to 6 ("Strongly agree"). Participants then read the following instructions:

> You and everyone else participating in this study have been assigned 11 "tickets" for a real lottery. At the end of the study, in a week or so, your tickets and those of all other participants will be entered in the lottery, and we will randomly draw tickets to determine the winners of the prizes (including $200 in cash and $50 Amazon gift certificates). The more tickets you have for the lottery, the higher your chances of winning a prize – just like a raffle. If you have 20 tickets, you'll be twice as likely to win as if you have 10 tickets. In the games we're about to describe, you'll have a chance to increase your number of tickets (and your chance of winning in the final lottery) or to lose some of them.
>
> In this game, we're going to randomly pair your choice of actions with the choice of someone else who has completed this online survey. How much you win or lose depends on both your own choice and your partner's choice. Here's how it works. You both have two alternatives. If you choose to "Cooperate" and your random partner also chooses to "Cooperate," you'll both get 5 more tickets—so you'd have 16 total after the first game. That's a moderately good outcome for you both. However, if you choose to "Cooperate" and your partner chooses to "Compete," you'll lose 10 tickets (giving you 1 total) and they'll get 10 additional ones. You lose big and your partner wins big. If you choose to "Compete" and your partner chooses to "Cooperate," then you'll get 10 more tickets (21 total) and your partner will lose 10 (1 total). You win big and your partner loses big. Finally, if both of you choose to "Compete," you both lose 5 tickets (giving you 6 total)—a moderate loss for both of you. In a real world situation, the choice to "cooperate" or "compete" would involve some specific action. For the purpose of our game, you only need to indicate your choice.

The payoff matrix was the same as that used by Kelley and Stahelski (1970a). Participants were then shown a table reiterating the payoffs and indicated their own choice of cooperate/compete and their assumption about their partner's cooperate/compete choice.

After this, participants were asked to indicate what they were thinking and what they assumed their partner would be thinking during the game. They rated their own competitive intentions by recording agreement with three items ("I wanted to beat my partner," "I wanted to take advantage of my partner," and "I wanted to be fair to my partner," with this last item reverse scored) on a scale ranging from 1 ("Strongly disagree") to 6 ("Strongly agree"). They then rated their assumptions about their partner's intentions on the same items (e.g., "He/she wanted to beat me").

As indicated in the instructions, tickets were indeed assigned to participants on the basis of a random matching of their responses with those provided by Columbia MBA students who participated in the game as part of a class exercise. Drawings were conducted, as indicated in the participant instructions, on the basis of these tickets.

Results

As in Study 1, we began by testing for main effects consistent with projection and stereotyping. Means and correlations are shown in Table 3. As expected, self competitive intentions (an average of the three mental state items) were positively correlated with assumed MBA competitive intentions, consistent with projection. Competitive stereotype was also positively correlated with assumed MBA competitive intentions, consistent with stereotyping.

Table 3
Means and correlations between constructs, Study 2.

	Mean	*SD*	1	2	3
1. Similarity	2.85	1.14	–		
2. Stereotype	3.42	.90	−.42**	–	
3. Self intentions	2.56	.81	−.19	.38**	–
4. Assumed MBA intentions	3.42	.97	−.48**	.62**	.50**

** Two-tailed $p < .01$.

This pattern of results suggests that participants may have relied on both themselves and stereotypes in gauging their MBA partner's competitive intentions. The central prediction of the present paper is that the reliance on these inferential strategies would be governed by perceived similarity. As in Study 1, to test for this pattern of moderation, we ran multiple regressions, first predicting assumed MBA partner competitive intentions with self competitive intentions and competitive stereotype. In a second model, we added perceived similarity and two interaction terms: self intentions × perceived similarity and stereotype × perceived similarity. Our account predicts that this first interaction term should be significant and positive (i.e., projection increases with perceived similarity) and the second interaction term should be significant and negative (i.e., stereotyping declines with perceived similarity).

As shown in Table 4, the regression results were consistent with these predictions. The self intentions × perceived similarity interaction term was significant and positive and the negative stereotype × perceived similarity interaction was significant and negative.

As in Study 1, to clarify the pattern of the interaction, we plotted slopes based on these regression models. The left panel in Fig. 2 shows the relationship between self intentions and assumed MBA counterpart intentions, which we take as a measure of projection (based on our regression Model 2, controlling for the effect of stereotype). As expected, participants one standard deviation above the mean in perceived similarity showed a positive relationship between own intentions and assumed MBA intentions. Participants one standard deviation below the mean showed a negative relationship between own intentions and assumed MBA intentions. The right panel of Fig. 2 shows the relationship between stereotype and assumed MBA intentions, which we take as a measure of stereotyping (based on our regression Model 2, controlling for the effect of self intentions). As expected, participants one standard deviation below the mean in perceived similarity showed a positive relationship between stereotype and assumed MBA intentions. Participants one standard deviation above the mean showed essentially no relationship.

Discussion

Study 2 extended the findings of Study 1 in the context of an experimental strategic interaction. As in Study 1, and consistent with our account, projection and stereotyping appeared to be moderated by assumed similarity: higher levels of assumed similarity

Table 4
Models of assumed counterpart preferences, Study 2.

Model	Variable	Standardized coefficients		Model		
		β	t	R^2	ΔR^2	F
1	Self intentions	.31	3.35**	.684	.468	32.99**
	Stereotype	.51	5.55**			
2	Self intentions	−.17	.78	.763	.115	6.59**
	Stereotype	.90	4.91**			
	Similarity	−.08	.30			
	Similarity * Self intentions	.75	2.44*			
	Similarity * Stereotype	−.80	3.16**			

* Two-tailed $p < .05$.
** Two-tailed $p < .01$.

were associated with greater projection and lower levels of stereotyping.

Study 3

Studies 1 and 2 generally supported our account, but they leave several important questions unresolved. First, those studies used correlational methods, relying on natural variance in perceived similarity. In Study 3, we sought to clarify the causal impact of perceived similarity by manipulating it. Second, Studies 1 and 2 employed generally negative (e.g., competitive) stereotypes, leaving open the question of whether perceived dissimilarity resulted in stereotype use or perhaps a more basic heuristic of "different is bad." We believe dissimilarity tends to prompt use of relevant stereotypes, whether positive or negative (see Ames, 2004a). In Study 3, we sought evidence for our predictions involving both cooperative and competitive stereotypes. Lastly, Studies 1 and 2 used between-participant measures of projection and stereotyping. In Study 3, we adapted methods used in prior work (e.g., Ames, 2004a) to create within-participant measures of projection and stereotyping, looking at the assumptions individual actors make about counterparts across a series of judgments.

To address these issues, Study 3 featured male and female participants playing an ultimatum game against the profile of someone of the opposite sex. This design allowed us to employ two different widely-held—though not necessarily correct—stereotypes: that, in strategic interactions, men are competitive and women are conciliatory (e.g., Kray, Thompson, & Galinsky, 2001; Walters, Stuhlmacher, & Meyer, 1998). Before our participants played the game, we manipulated their sense of similarity to their opposite-sex counterpart. We expected that, compared to those in the dissimilarity condition, those in the similarity condition would show higher levels of projection and lower levels in stereotyping in their judgment of their counterpart's mental states.

Method

Participants

Eighty-one US adults (48 women, 59.3%) participated as part of an online survey research study for which they were paid. Average age was 35.9 years (SD = 9.8). Three participants (3.7%) identified themselves as African–American, 14 (17.3%) as Asian/Asian–American, 57 (70.4%) as Caucasian, and 5 (6.2%) as Latino/Hispanic. Of the 79 participants who identified their education, 72 (91.1%) had at least some education beyond high school and 45 (57.0%) had at least a bachelor's degree (including those with a graduate degree).

Materials and procedure

Participants completed the survey materials online. After reviewing informed consent materials and indicating their gender, participants were presented with a series of questions that formed the basis of the similarity manipulation. Three dichotomous choices were presented, following an approach used in prior work (Ames, 2004a). Participants first reviewed two jokes, indicating which one they thought was funnier. One joke concerned a turtle who was mugged by a gang of snails and the other concerned a dog sending a telegram. Next, participants saw images of two paintings side by side. One picture was "Improvisation 35" by Wassily Kandinsky (labeled "Painting A"); the other was "Blaue Nacht" by Paul Klee (labeled "Painting B"). Participants were asked to identify the one they preferred. A final dichotomous choice concerned a criminal case adapted from Pennington and Hastie (1992), the same case used by Kunda, Davies, Adams, and Spencer (2002) in research on stereotype activation. The case outlined ambiguous evidence concerning a bank security guard who had been charged with embezzlement. Participants indicated whether they thought the defendant was innocent or guilty.

After answering these questions, participants read that they would be playing the "proposer–responder" game and would be assigned a partner. They were asked to press an on-screen button to find out more about their partner. After doing so, a separate onscreen box appeared, revealing their partner's responses to the three dichotomous questions described earlier. Those assigned to the similarity condition read that their partner had made the same three choices they had; those assigned to the dissimilarity condition read that their partner had made the opposite choices. All participants were assigned to a target with an opposite sex name (i.e., men were assigned to "Rachael" as a partner; women were assigned to "Michael"). For instance, a male participant in the similarity condition who picked the turtle joke as funnier, preferred Painting A, and thought Graves was guilty read the following:

> Rachael picked the turtle joke as her favorite. Her comments: "I thought this one was much funnier."
>
> Rachael preferred Painting A. Her comments: "This one just seemed more artistic and beautiful." [A small image of Painting A accompanied the text]
>
> Rachael indicated that she thought Graves was guilty. Her comments: "The evidence was pretty clear to me, so I have to say he's guilty."

Following Ames's (2004a) method, participants were asked to reflect on what they had learned: "We realize we've told you only a few things about your partner up to this point. But we'd like you

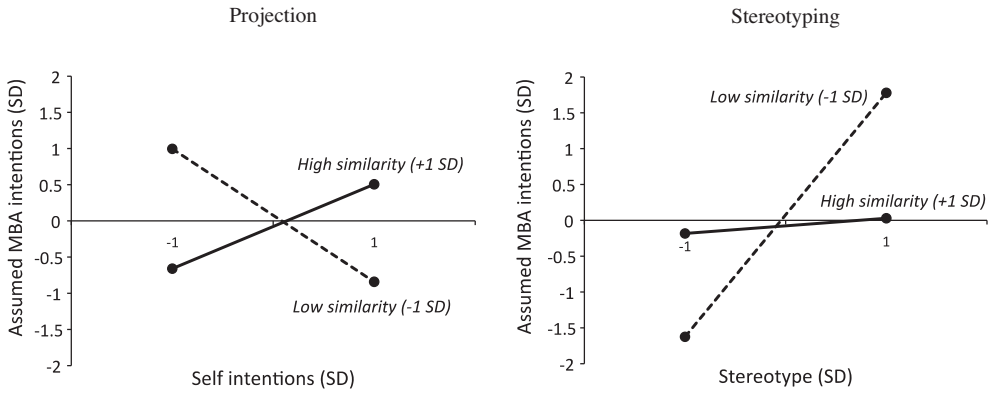

Fig. 2. Projection and stereotyping in assumptions about MBA student counterpart's competitive intentions as a function of perceived similarity, Study 2. *Note*. Left panel shows relationship between self intentions and assumed counterpart intentions for low (−1 *SD*) and high (+1 *SD*) similarity. Right panel shows relationship between stereotype and assumed counterpart intentions for low (−1) and high (+1) similarity.

to take a moment to think about the ways in which you're likely similar to [different from] each other." Participants were then asked to write a few sentences in an on-screen box describing similarities [differences]. After this, participants rated their perceived similarity to their partner on a scale ranging from 1 ("Very dissimilar") to 7 ("Very similar"). This measure serves in part as a manipulation check.

Next, participants were introduced to the "Proposer–Responder Game" with instructions reading, in part:

> In the game, two individuals, the Proposer and Responder, have the opportunity to divide $10 (cash) between them. The Proposer makes an offer to the Responder. The Responder can then either accept the offer, in which case the Responder will receive the amount offered and the Proposer will get to keep the balance. Alternatively, the Responder can reject the offer and both receive nothing. Note that the Proposer can make just one offer and this offer cannot be withdrawn. Likewise, the Responder makes only one decision. There is no communication between the players, so no bargaining is possible.

Participants were told that they would be assigned to one of the roles subsequently, but were first going to be asked a series of questions about how they and others would approach the game. The survey then provided 10 items gauging competitive mental states that participants rated on a scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). Some questions concerned competitive priorities and values (e.g., "My priority is to maximize my own outcome, regardless of what my partner gets," "I think it is ok to take advantage of my partner," "I am willing to sacrifice some of my outcome to help my partner" [reversed]). Others concerned competitive reactions (e.g., "If I was a Proposer and my partner rejected my offer, I'd be angry," "If I was a Responder and received a very low offer, I'd be angry"). Items were scored such that higher scores indicated more competitive attitudes (i.e., cooperative items were reverse scored).

Participants were randomly assigned to one of two counterbalanced sequences of questions. In the target-self-stereotype condition, participants first answered the 10 items for their partner ("It is important for my partner that we both are happy with the outcome"), then answered the 10 items for themselves ("It is important to me that we both are happy with the outcome"), and finally answered the 10 items for the relevant gender (the typical man for female participants; the typical woman for male participants; e.g., "It is important for most men that their partner and they are both happy with the outcome"). In the target-stereotype-self condition, the order of these last two sets of items was reversed.

After completing these competitive mental state items, participants were assigned to their role. In all cases, participants were assigned to the Proposer role. Participants then indicated their offer, "how much of the $10 are you proposing to go to your partner (with the remainder going to you)?" Participants were then asked "What is your estimate of your partner's offer if he or she is assigned as the Proposer?" and "What is your estimate of the average male [female] Proposer's offer?" Participants went onto indicate reservation prices: "Even though you're in the Proposer role, imagine for a moment that you were the Responder. What's the minimum amount of offer that you'd accept?" Participants then indicated estimated reservation prices for their specific partner and for the relevant gender (most females or most males). Lastly, participants indicated their estimate of the average female [male] Proposer's offer. Participants completed the survey by indicating their age and sex and by indicating the gender of their assigned partner.

Table 5
Means by similarity condition and correlations across conditions, Study 3.

	Means		t	Correlations	
	Similarity condition	Dissimilarity condition		1	2
1. Similarity	4.95 (.99)	2.43 (1.32)	9.81**	–	–
2. Stereotyping	.24 (.29)	.37 (.31)	1.74†	−.31*	
3. Projection	.45 (.29)	.25 (.42)	2.23*	.35**	−.45**

† Two-tailed $p < .10$.
* Two-tailed $p < .05$.
** Two-tailed $p < .01$.

Results

Similarity manipulation check

Means, t-tests, and correlations are shown in Table 5. The manipulation had the expected effect, with perceived similarity significantly higher in the similarity vs. dissimilarity condition. The effect of similarity condition emerged for the male participants (4.82 (.88) vs. 2.81 (1.38), $t(31) = 5.03$, $p < .01$) and for the female participants (5.04 (1.06) vs. 2.14 (1.24), $t(46) = 8.74$, $p < .01$).

Stereotype content

We assumed that shared (though not necessarily accurate) stereotypes exist portraying women as less competitive and aggressive than men. To gauge this, stereotypes were assessed in two ways: (1) ascribed competitive mental states for typical men or women and (2) assumed offers and reservation prices. Both sets of analyses confirmed our expectations regarding stereotypes.

Across the 10 mental state items, typical women were assumed (by men) to be significantly less competitive than typical men, as perceived by women (typical woman estimate mean = 2.81 (.28), typical man estimate mean = 3.14 (.39); $t(85) = 2.81$, $p < .01$). However, self responses for the competitive mental state items did not differ for our female and male participants (mean women's response = 2.61 (.45), mean men's response = 2.71 (.41), $t(83) = 1.02$, $p = .31$), suggesting the stereotype is inaccurate.

For offers, both female and male participants perceived that female proposers would give a larger opening offer than male proposers, 4.89 vs. 4.53, $t(85) = 2.60$, $p = .01$. For reservation prices, both female and male participants perceived that female responders would be willing to settle for a smaller offer than male responders, 3.90 vs. 4.63, $t(85) = 3.89$, $p < .001$. Again, actual opening offers did not different significantly for our male and female participants (male mean = 4.85 (.66), female mean = 4.77 (.54), $t(85) = .56$, $p = .58$) nor did actual reservation prices (male mean = 3.93 (1.16), female mean = 4.05 (1.15), $t(85) = .47$, $p = .64$).

Projection and stereotyping in mental state inferences

Following Ames (2004a), within-participant measures of stereotyping and projection were created using multiple regression analyses. Across the 10 competitive mental state items, each participant's ratings of their specific partner were predicted by both the participant's own mental state ratings and their ratings for the typical man or woman (i.e., their stereotype rating). Thus, for male participants, the specific female target's mental states were predicted in a within-participant across-item regression by own mental states and ratings of typical female mental states; for female participants, the specific male target's mental states were predicted in a within-participant across-item regression by own mental states and ratings of typical male mental states. As in Ames (2004a), the standardized beta for self ratings was taken as a measure of projection (how closely their own mental states

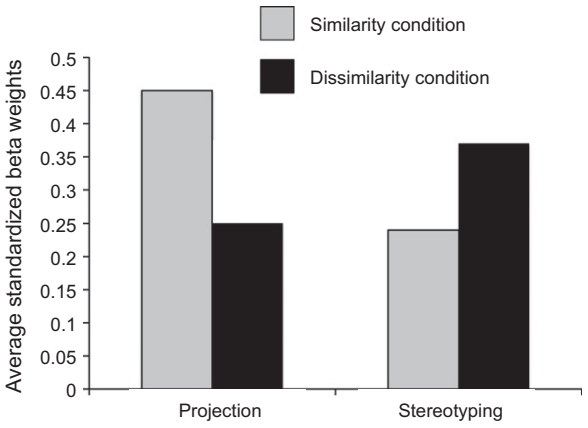

Fig. 3. Projection and stereotyping in mental state inferences about opposite-sex ultimatum game counterpart as a function of similarity and dissimilarity condition, Study 3.

corresponded to those they ascribed to their specific partner) and the standardized beta for stereotype ratings was taken as measure of stereotyping (how closely their gender stereotype mental states corresponded to those they ascribed to their partner). These calculations required all 30 responses (three sets of ratings for the 10 items) from a participant. Because some participants omitted responses to selected items, the sample size for this analysis was 64 cases.

As shown in Table 5, and consistent with our predictions, participants in the similarity condition showed higher levels of projection than those in the dissimilarity condition, whereas participants in the dissimilarity condition showed higher levels of stereotyping than those in the similarity condition vs. dissimilarity. The interaction is graphed in Fig. 3. ANOVA models predicting projection and stereotyping with similarity condition and participant sex revealed only significant effects of similarity condition (projection $F(1, 60) = 6.06$, $p < .05$; stereotyping $F(1, 60) = 2.76$, $p = .10$); participant sex main effects ($ps > .17$) and interaction effects ($ps > .19$) were not significant.

Correlation analyses using the continuous perceived similarity manipulation check measure were also consistent with our predictions (see Table 5). Perceived similarity was positively correlated with projection and negatively correlated with stereotyping. The projection and stereotyping measures were negatively correlated with one another.

Reservation price estimates

Along with judgments of counterpart mental states, our participants estimated values directly related to the ultimatum bargaining game, including own offer (as Proposer), own reservation price (as Responder), and the reservation price of a typical man or woman (with sex matching counterpart sex). We suspected that for those in the similarity condition, offer price would be more closely related to self reservation price than estimated stereotype (typical man/woman) reservation price. We suspected that for those in the dissimilarity condition, offer price would be more closely related to estimated stereotype reservation price and than self reservation price.

Regression results predicting offer amounts with self reservation prices and stereotype reservation prices simultaneously were consistent with these expectations. For those in the similarity condition, self reservation price was a significant predictor of offer amount ($\beta = .35$, $t(41) = 2.11$, $p < .05$) but stereotype reservation price was not ($\beta = .08$, $t(41) = .46$, $p = .65$). For those in the dissimilarity condition, stereotype reservation price was a directionally-significant predictor of offer amount ($\beta = .29$, $t(34) = 1.78$, $p = .08$) but self reservation price was not ($\beta = .10$, $t(34) = .62$, $p = .54$).

Discussion

The results of Study 3 lent support to our predictions. Men and women in the similarity condition showed greater projection, and reduced stereotyping, toward their opposite-sex counterparts compared to those in the dissimilarity condition.

Study 4

Study 4 was designed to answer some remaining questions raised by the previous studies and to shed light on a new issue, namely how perceivers may dynamically shift between projection and stereotyping in strategic contexts. To do so, we had online participants engage in a task that required them to gauge their trust in a counterpart in an agent role, a common feature of strategic interaction and organizational life (Eisenhardt, 1989). We manipulated the stereotype group to which the counterpart belonged (MBA students or Psychology majors) and manipulated perceived similarity to the counterpart. By matching participants with responses from actual MBA or Psychology students, we were able to give our respondents genuine feedback on their judgments—and then gauge the extent to which they used stereotyping and projection to judge their counterpart's intentions in a subsequent, post-feedback task.

This design let us achieve five particular goals. First, we measured a number of other relevant constructs and analyzed their roles. We examined liking as a possible alternative explanation, testing for our prediction while controlling for liking. We also measured trust to see whether it would act as a mediator for our effects in this principal–agent context. Second, we counterbalanced the order of measures (e.g., self, stereotype group) through the survey to address the possibility that our results simply reflect order effects. Third, we manipulated stereotypes, capturing both more and less positive stereotypes within the same design. Fourth, we broadened the base of evidence for our predicted effects by using a different manipulation of similarity (unlike Study 3, Study 4 relied on selective attention to similarities or differences) and by gauging judgments in a different strategic context (in this case, trust for an agent). Fifth, by gauging perceivers' judgments before and after feedback about a counterpart, we captured an entirely different kind of intrapsychic evidence of shifts in inferential strategies.

Method

Participants

Two-hundred and twenty-three volunteers from the Columbia Center for Decision Sciences (CDS) Virtual-Lab database (42% male; median household income: $42,000/year; median age: 38, age range: 18–75) responded to an e-mail solicitation and completed an on-line survey. Our review of responses identified 19 who provided incomplete or incoherent responses to our open-ended question about similarities or differences (our similarity manipulation, described below). We restrict our analyses to the remaining 204 participants. Among these respondents, 127 (62.3%) were women; the average age was 42.18 ($SD = 15.76$). Nearly half (49.0%) reported that they were married. Slightly over half (55.9%) indicated an education level of a bachelor's degree or higher. About a quarter (26.9%) indicated that they were unemployed or retired; 13.2% indicated that they were students. For race, 84.8% identified themselves as white, 6.9% as Hispanic, 5.9% as Asian, 4.4% as African American, and 2.5% as American Indian.

Materials and procedure

After completing informed consent materials, participants were given some information about the Public Broadcasting Service or PBS, describing PBS's mission and activities and indicating that nearly all of PBS's income is from donations. Participants were then introduced to the "Sender-Agent Exercise," reading that they would be paired online with a randomly selected other person. The instructions read, in part:

> One person, the Sender, will be asked to imagine they had an account of $100. The Sender will choose how much, if any, of this account to forward to the Agent. The Agent will then choose how much, if any, of the amount forwarded to send to PBS as a donation. Any donation sent by the Agent to PBS will be DOUBLED. If the Sender keeps money for him or herself, or the Agent keeps money for him or herself, they will receive the amount they selected. Only the amount forwarded to PBS will be doubled. ... While you will not meet or be identified to your counterpart, Agents will know that Senders began with an account of $100. And Senders will learn about their paired Agent's choices.

Instructions noted that some of the Sender-Agent pairs in the study would be randomly selected and that for those pairs the exercise would not be hypothetical but real, i.e., that they would receive the $100 account and that funds would be distributed to them and PBS according to their choices in the survey. Participants were then asked to think about the agent role and provide responses to a series of questions about their own attitudes and their assumptions about the attitudes of various groups. All participants answered three sets of eight questions about (a) themselves, (b) MBA students, and (c) Psychology majors, in a randomly counterbalanced order. The self version of the items read as follows: I would feel obligated to pass along all the funds from the Sender to PBS; I would deserve to keep a share of the money for myself; It would be unethical to keep the money for myself; I think it would be appropriate to keep some of the money for myself; I would feel like I would be letting the Sender down if I did not pass all the money to PBS; I would feel fine about keeping all the money for myself; I would feel guilty if I did not send all the money to PBS; The Sender would be foolish or dumb to trust me with any money. Questions were modified for each stereotype group (e.g., "As agents, most MBA students [psychology majors] would feel obligated to pass along all the funds from the Sender to PBS.") Participants indicated their responses on a scale from 1 ("Strongly disagree") to 7 ("Strongly agree").

After completing all three sets of agent attitude items, participants were asked to consider a negotiation situation in which two people were trying to reach agreement on a single issue, like the price of a car. Participants then completed three sets of eight questions about attitudes in such a negotiation situation—their own, those of MBA students, and those of psychology majors—again in a randomly counterbalanced order. The self version of the items read as follows: I am more interested in getting a good deal than in being a nice person; I have respect for my counterpart in the negotiation; I want to create real mutual trust between us both; I want to beat or outperform my counterpart in the negotiation; I want to exploit my counterpart if possible; I am willing to explore ways to help my counterpart satisfy their goals; I care a lot about having a good relationship with my counterpart; I am very motivated to get every last dollar or bit of value that I can. Questions were modified for each stereotype group (e.g., "Most MBAs [psychology majors] would be more interested in getting a good deal than in being a nice person"). Participants indicated their responses on a scale from 1 ("Strongly disagree") to 7 ("Strongly agree").

Participants were then told they had been assigned to the Sender role in the exercise. Half were told that they had been paired with an MBA student, the other half that they had been paired with a Psychology major in the role of Agent. This random assignment (MBA vs. psychology major) served as the stereotype manipulation.

Participants then were randomly assigned to receive either similarity or difference instructions. This manipulation follows work by Ames (2004b) showing that channeling people's attention to similarities or differences leads to a shift in perceived similarity. Participants in the similarity condition read:

> Think about this individual counterpart for a moment. You may be different from him or her in some trivial ways, but you likely have some deeper, important similarities. Think about the important ways in which they are likely SIMILAR to you. In the space below, please write a few sentences and describe at least THREE IMPORTANT ways in which this person is SIMILAR to you. Try to focus on things that really matter, not trivial similarities.

Participants in the dissimilarity condition read:

> Think about this individual counterpart for a moment. They may be similar to you in some trivial ways, but they likely have some deeper, important differences. Think about the important ways in which you are likely DIFFERENT from them. In the space below, please write a few sentences and describe at least THREE IMPORTANT ways in which you are DIFFERENT from them. Try to focus on things that really matter, not trivial differences.

Next, participants rated four sets of statements on a scale from 1 ("Strongly disagree") to 7 ("Strongly agree"):(1) two post-manipulation similarity items ("I think I am pretty similar to this counterpart" and "I feel like I have a good deal in common with this counterpart"); (2) the eight "agent attitude" items described above, modified to describe their specified counterpart (e.g., "They feel obligated to pass along all the funds from me to PBS"); (3) two items regarding liking ("I like my Agent counterpart" and "I would probably enjoy spending time with my Agent counterpart"); and (4) two items regarding trust ("I feel that my Agent counterpart is dependable, reliable" and "I do NOT trust my Agent counterpart" – reverse-scored).

Participants were then reminded that, as a Sender, they had a $100 "account" from which they could choose to forward none, some, or all to their Agent counterpart. They were reminded that any amount the Agent in turn forwarded to PBS would be doubled and that some sets of choices would be randomly chosen and fulfilled with actual payments. Participants then indicated what amount they would forward to their agent counterpart, in increments of $10 ranging from $0 to $100.

The online survey system then randomly chose a profile based on actual responses gathered through separate "agent" surveys. Participants in the MBA condition received responses from an actual MBA agent; those in the Psychology Major condition received responses from an actual psychology student. Participants saw a full table of contingent actions provided by their agent, i.e., 10 contingencies such as "If you forwarded $10 [$20, $30, etc.], your agent would have forwarded $10 of that to PBS."

Following this feedback, participants indicated their reactions, rating five items on a scale ranging from 1 ("Not at all") to 5 ("A great deal"): How surprised are you with your Agent's responses?, How frustrated are you with your Agent's responses?, How disappointed are you with your Agent's responses?, How impressed (in a positive way) are you with your Agent's responses?, and How astonished (in a positive way) are you with your Agent's responses?

Next, participants rated two (post-feedback) statements about perceived similarity to their counterpart on a scale from 1 (“Strongly disagree”) to 7 (“Strongly agree”): I think I am pretty similar to this Agent and I feel like I have a good deal in common with this Agent. Participants were then asked to consider their agent in the negotiation situation described earlier. Using the same scale as above, participants rated their agreement on the eight negotiation attitude items, modified for their agent (e.g., “This Agent would be more interested in getting a good deal than in being a nice person”). Participants concluded the survey by answering demographic questions.

Results

Manipulation check

The two similarity items (correlated at $r(204) = .79$, $p < .01$) were averaged to create a composite measure of perceived similarity. Table 6 shows means and *t*-tests. As expected, perceived similarity was higher in the similarity condition for both the psychology and MBA stereotype conditions.

Group stereotypes

Our choice of stereotypes for manipulation was based on the assumption that one group (Psychology majors) would evoke more positive expectations than the other (MBA students) in terms of trustworthiness as an agent. For every one of the eight agent attitude items, psychology majors were seen as more reliable and trustworthy than MBA students. For example, for the item, “As agents, most MBA students [psychology majors] would feel obligated to pass along all the funds from the Sender to PBS,” MBA students were rated an average of 3.85 ($SD = 1.58$) compared to the average rating for psychology majors of 4.49 (1.48); paired-sample $t(198) = 4.84$, $p < .01$. Across the eight items, *t* values ranged from 2.13 to 7.30 (all *p*s < .04).

Stereotyping and projection

As in Study 3, we computed indices of stereotyping and projection by conducting within-participant multiple regressions, predicting assumed agent attitudes for each participant’s specific counterpart with the participant’s own agent attitudes and the assumed agent attitudes for the relevant stereotype group (MBAs or psychology students). Ratings were first normalized within item set, meaning that the resulting coefficients were standardized betas. We took the extent to which assumed relevant stereotype group responses predicted assumed specific counterpart responses as a measure of stereotyping and the extent to which self responses predicted assumed specific counterpart responses as a measure of projection.

Starting with stereotyping as the dependent variable, we ran a two-factor ANOVA featuring similarity condition (similarity vs. dissimilarity) and stereotype group (psychology vs. MBA), which showed a main effect of similarity in the expected direction ($F(1, 174) = 3.26$, $p = .07$), as well as an effect of stereotype group ($F(1, 174) = 5.53$, $p < .05$); the interaction between similarity and stereotype group was not significant ($F(1, 174) = .32$, $p = .58$). Means are shown in Table 6.

A parallel two-factor ANOVA for projection likewise revealed the expected main effect of similarity ($F(1, 174) = 9.26$, $p < .01$), as well as an effect of stereotype ($F(1, 174) = 9.96$, $p < .01$); the interaction between similarity and stereotype was not significant ($F(1, 174) = .66$, $p = .42$). Means are shown in Table 6.

To gauge our focal interaction (that the similarity condition had different effects on projection and stereotyping), we ran a repeated-measures ANOVA with projection and stereotyping as the two-level repeated measure and with similarity condition and stereotype assignment as between-participant factors. This confirmed the expected interaction of the repeated-measures factor and similarity ($F(1, 174) = 8.73$, $p < .01$). This interaction was not qualified by stereotype (i.e., the three-way interaction of the repeated-measures factor, similarity, and stereotype was not significant, $F(1, 174) = .70$, $p = .41$).

Setting aside the manipulation of similarity, we tested for the effect of the continuous (manipulation check) measure of perceived similarity. As expected, perceived similarity was positively associated with projection and negatively associated with stereotyping; correlations are shown in Table 7.

In sum, and consistent with our central claim, those in the similarity condition displayed lower levels of stereotyping and higher levels of projection compared to those in the dissimilarity condition. This effect was not contingent on the stereotype group (MBA vs. psychology major).

Liking

The two liking items ($r(204) = .60$, $p < .01$) were averaged to create a composite measure of liking ($\alpha = .74$, mean = 4.68, $SD = .88$). We did not expect liking to mediate or supplant perceived similarity as a predictor of stereotyping and projection, but we examined this possibility. As shown in Table 7, liking correlated positively with perceived similarity and projection and negatively with stereotyping. We conducted a multiple regression, predicting stereotyping with perceived similarity and liking. Perceived similarity emerged as a significant predictor ($\beta = -.21$, $t(175) = 2.47$, $p = .01$) and liking did not ($\beta = -.05$, $t(175) = .61$, $p = .54$). A Sobel test suggested that liking did not act as a significant mediator of perceived similarity’s link with stereotyping (Sobel statistic = −.61, $p = .54$). In another multiple regression, we predicted projection with perceived similarity and liking. Perceived similarity emerged as a marginally significant predictor ($\beta = .15$, $t(175) = 1.78$, $p = .08$) as did liking ($\beta = .15$, $t(175) = 1.68$, $p = .10$). A Sobel test found a marginal impact of liking as a mediator (Sobel statistic = 1.64, $p = .10$). In short, although liking was related to our other constructs

Table 6
Means, standard deviations, and *t*-tests of perceived similarity, projection, and stereotyping by similarity and stereotype condition, Study 4.

	Both stereotypes		Psychology only		MBA only	
	Similarity	Dissimilarity	Similarity	Dissimilarity	Similarity	Dissimilarity
Perceived similarity	4.81 (.94) $t(202) = 6.91$, $p < .01$	3.80 (1.15)	4.89 (.94) $t(100) = 4.14$, $p < .01$	4.10 (.97)	4.75 (.93) $t(100) = 5.93$, $p < .01$	3.47 (1.25)
Projection	.49 (.49) $t(176) = 2.67$, $p < .01$	.28 (.56)	.58 (.53) $t(89) = 1.55$, $p = .12$	.41 (.52)	.40 (.44) $t(85) = 2.79$, $p < .01$	.10 (.55)
Stereotyping	.19 (.45) $t(176) = 1.56$, $p = .12$	.30 (.46)	.13 (.48) $t(89) = .91$, $p = .37$	.21 (.41)	.25 (.42) $t(85) = 1.61$, $p = .11$	.42 (.51)

Notes: “Both stereotypes” reflects both Psychology and MBA stereotype conditions combined; Similarity and dissimilarity groups reflect participant assigned to the similarity or dissimilarity manipulation conditions

Table 7
Correlations between selected constructs by stereotype condition, Study 4.

	2	3	4	5
Both stereotypes				
1. Perceived similarity	.23**	−.24**	.55**	.45**
2. Projection	–	−.42**	.23**	.37**
3. Stereotyping		–	−.17*	−.13†
4. Liking			–	.68**
5. Trust				–
Psychology only				
1. Perceived similarity	.19t	−.27**	.40**	.43**
2. Projection	–	−.57**	.16	.33**
3. Stereotyping		–	−.16	−.09
4. Liking			–	.69**
5. Trust				–
MBA only				
1. Perceived similarity	.23*	−.19†	.66**	.44**
2. Projection	–	−.23*	.25*	.38**
3. Stereotyping		–	−.13	−.14
4. Liking			–	.67**
5. Trust				–

† Two-tailed $p < .10$.
* Two-tailed $p < .05$.
** Two-tailed $p < .01$.

(perceived similarity, stereotyping, and projection), it did not supplant or fully mediate the effects of perceived similarity.

Trust

The two trust items ($r(204) = .59$, $p < .01$) were averaged to create a composite measure of trust ($\alpha = .73$, mean = 4.88, $SD = 1.05$). We believe perceived similarity is distinct from trust, though we also think it is possible that trust might carry (that is, statistically mediate) some or all of the effects of perceived similarity in the context of the Sender-Agent game. It is worth noting that trust was positively correlated with perceived similarity and projection and negatively correlated with stereotyping (see Table 7). We conducted a multiple regression, predicting stereotyping with perceived similarity and trust. Perceived similarity emerged as a significant predictor ($\beta = -.23$, $t(175) = 2.79$, $p = .01$) and trust did not ($\beta = -.04$, $t(175) = .46$, $p = .65$). A Sobel test suggested that trust did not act as a significant mediator of perceived similarity's link with stereotyping (Sobel statistic = −.46, $p = .65$). In another multiple regression, we predicted projection with perceived similarity and trust. Perceived similarity was not a significant predictor ($\beta = .09$, $t(175) = 1.13$, $p = .26$) though trust was ($\beta = .33$, $t(175) = 4.31$, $p < .01$). A Sobel test found a significant impact of trust as a mediator (Sobel statistic = 3.71, $p < .01$). In short, trust did not appear to account for the link between perceived similarity and stereotyping, though it did appear to mediate the link between perceived similarity and projection in the Sender-Agent game.

Impact of agent attitude judgments

We have focused thus far on trying to explain how participants attempted to read their agents' minds. To clarify whether this mindreading mattered, we computed an aggregate measure of the attitudes participants ascribed to the agents. We did this by reversing the four lower trust agent attitude items (e.g., "They feel they deserve to keep a share of the money for themselves") and averaging them with the four higher trust agent attitude items (e.g., "They feel obligated to pass along all the funds from me to PBS"; for this 8-item scale, $\alpha = .88$, mean = 4.36, $SD = .60$). This measure of assumed agent attitudes was positively correlated with the amount of money forwarded to the agent ($r(204) = .37$, $p < .01$). This positive correlation emerged within the psychology major condition ($r(102) = .34$, $p < .01$) and within the MBA condition ($r(102) = .39$, $p < .01$). In none of these cases (psychology major condition, MBA condition, or pooled) were any of the other measured constructs (including liking, trust, and similarity) significantly correlated with amount of money forwarded ($ps > .14$).

Shifts in inferential strategies

As with the measures of projection and stereotyping focused on judgments of the counterpart's agent attitudes reported above, we computed a second set of projection and stereotyping measures focused on post-feedback judgments of the counterpart's negotiation attitudes. Using within-participant regression models, we took

Table 8
Correlations between post-feedback constructs, Study 4.

	2	3	4	5	6	7
Both stereotypes						
1. Increase in similarity	−.22**	−.50**	.35**	.18*	−.04	.12
2. Surprise	–	.20**	.30**	−.05	−.15*	.06
3. Negative reaction		–	−.45**	−.22**	−.06	−.09
4. Positive reaction			–	.13†	.08	.03
5. Increase in projection				–	−.50**	.86**
6. Increase in stereotyping					–	−.87**
7. Relative shift to projection						–
Psychology only						
1. Increase in similarity	−.35**	−.60**	.45**	.10	.09	.01
2. Surprise	–	.33**	.10	−.07	−.15	.04
3. Negative reaction		–	−.53**	−.16	−.33**	.10
4. Positive reaction			–	.08	.26*	−.10
5. Increase in projection				–	−.54**	.87**
6. Increase in stereotyping					–	−.88**
MBA only						
1. Increase in similarity	−.11	−.37**	.26**	.24*	−.15	.23*
2. Surprise	–	.06	.50**	−.09	−.11	.02
3. Negative reaction		–	−.36**	−.28*	.26*	−.32**
4. Positive reaction			–	.19†	−.08	.16
5. Increase in projection				–	−.40**	.83**
6. Increase in stereotyping					–	−.85**
7. Relative shift to projection						–

† Two-tailed $p < .10$.
* Two-tailed $p < .05$.
** Two-tailed $p < .01$.

standardized beta coefficients for self negotiation attitudes as an index of post-feedback projection and standardized beta coefficients for the relevant stereotype group negotiation attitudes as an index of post-feedback stereotyping.

By comparing the post-feedback perceived similarity measure with the initial measure of perceived similarity to the counterpart, we were able to measure whether changes in perceived similarity as a function of counterpart behavior feedback were associated with shifts in inferential strategies. We also used the measure of surprise (mean = 3.19, $SD = 1.36$), negative reactions (average of frustrated and disappointed, $r(204) = .76$, $p < .01$, $\alpha = .86$, mean = 1.71, $SD = 1.04$), and positive reactions (average of impressed and astonished, $r(204) = .62$, $p < .01$, $\alpha = .77$, mean = 3.44, $SD = 1.23$) to predict shifts in inferential strategies. We found some evidence to support our expectations.

As shown in Table 8, increases in perceived similarity (post- minus pre-feedback) were associated with increases in projection (post- minus pre-feedback). This effect was not significant in the psychology stereotype condition but was significant in the MBA stereotype condition (see Table 8). We also computed a measure of relative shift to projection, gauging the post-feedback balance between projection and stereotyping compared to the pre-feedback balance (i.e., the difference between post-feedback projection and stereotyping beta minus the difference between pre-feedback projection and stereotyping betas). In the MBA stereotype condition, we found that increased perceived similarity was associated with a shift to projection relative to stereotyping (see Table 8). We are not certain why these effects emerged in the MBA but not psychology stereotype condition. The conditions did not differ significantly in regards to the size or direction of shift in perceived similarity or in terms of negative or positive reactions. Those in the MBA condition showed slightly more surprise than those in the psychology condition (3.35 vs. 3.02, $t(202) = 1.76$, $p = .08$).

We also found evidence linking the surprise, negative reaction, and positive reaction measures to apparent changes in inferential strategies (see Table 8). For the psychology stereotype condition, negative reactions were associated with a decrease in reliance on the (generally positive) stereotype, whereas positive reactions were associated with an increase in projection. For the MBA stereotype condition, negative reactions were associated with an apparent shift away from projection and a shift toward the (generally negative) stereotype.

Discussion

Study 4 went beyond our prior results in several ways: using a new context (principal–agent relations), employing a new manipulation of similarity (based on selective attention), featuring a manipulation of more and less positive stereotypes (MBA and psychology students), employing multiple-item measures and additional constructs (including liking and trust), counterbalancing the order of self and stereotype responses, and providing participants with feedback, enabling us to look at within-perceiver shifts in perceived similarity and inferential strategies. The results were generally consistent with our expectations. Regardless of stereotype group, participants encouraged to reflect on similarities showed higher levels of projection and lower levels of stereotyping than those encouraged to reflect on differences. These results were not explained by liking, though trust appeared to mediate the effect of perceived similarity on projection. As perceivers received feedback about their counterparts, we found some evidence of shifts in inferential strategies. For those in the MBA stereotype condition, increases in perceived similarity were associated with shifts toward greater projection relative to stereotyping.

General discussion

Nearly a century ago, the Kaiser had a hunch. As reflected in our opening quote, on the eve of what we now know as World War I, he believed that the French had territorial ambitions and intended to act on them at the expense of Germany. Whether right or wrong, his assumption spurred events that resulted in tens of millions of lost and damaged lives. Some seven decades later, Ronald Reagan had a hunch as well, noting in the mid-1980s that, "For the Soviet leaders peace is not the real issue; rather, the issue is the attempt to spread their dominance using military power" (Plous, 1993). The President's hunch about the Soviet Union's goals, true or not, was shared by many in the West and fed into the most expensive military build-up in history. In strategic interactions—whether in national military policy, individual social dilemmas, or interpersonal or intergroup negotiations—all of us are like the Kaiser and Reagan: bound by our hunches about the other party's goals and intentions, by our pervasive, if imperfect, mind-reading. But how we pull off this everyday "magic" of intuiting the invisible mental states of counterparts remains something of a mystery. It is a mystery that scholars of strategic interaction must solve—and if perceivers employ multiple tools, the solution must address how they do so.

In this paper, we adapted the similarity-contingency model of social inference (Ames, 2004a, 2004b) to describe mind-reading in strategic interaction. Our results were generally consistent with our predictions. We found that perceived similarity appeared to moderate the use of projection and stereotyping in mind-reading. Higher levels of similarity were associated with greater projection and reduced stereotyping. Importantly, these subjective beliefs about similarity were not closely related to measures of actual similarity. Moreover, our results revolved around natural variance in perceived similarity (Studies 1 and 2) as well as experimental manipulations of perceived similarity, including overgeneralization from isolated cues (Study 3) and selective focus effects (Study 4). Our studies spanned a range of types of strategic interactions—including perceptual dilemmas, prisoner's dilemmas, ultimatum games, and principal–agent relations—and involved a variety of negative and positive stereotypes (of Chinese, MBA students, psychology students, men, and women). All four studies showed between-participant evidence of different levels of projection and stereotyping; our final study featured two rounds of judgment, with feedback between them, to show that shifts in individual perceivers' sense of similarity were associated with shifts in their balance of projection and stereotyping.

Our findings cohere with other recent work on the importance of mind-reading in strategic interaction (e.g., Bottom & Paese, 1997; McCabe et al., 2003) and synthesize seemingly-contradictory prior results in the literature on social dilemmas demonstrating excessive projection on the one hand (e.g., Kelley & Stahelski, 1970c) and a failure to recognize similarities on the other (e.g., Plous, 1993). Our results also show the limits of alternative accounts. A simpler model of "pervasive projection" fails to account for the decline in projection as assumed similarity decreases. Such a model would also not predict the important stereotyping effects we found. Likewise, a model of "stubborn stereotyping" fails to account for variance in stereotyping, or the potential of projection as an alternative route. We think a complete model of inference in strategic contexts has to accommodate both kinds of effects; the moderation claims we present here seem like a promising starting point for doing so.

Our results have a variety of limitations and raise a number of questions. Among the limitations is the fact that we gauged stereotyping and projection through explicit (albeit indirect) methods, asking people about their content of their judgments. It is possible

that this measurement approach could itself have altered how our participants thought about their counterparts; implicit measures (such as reaction times or functional imaging) might provide other useful perspectives on spontaneous mind-reading in strategic interaction. One question raised in our exploratory analyses in Study 4 is why trust mediated the impact of perceived similarity on projection but not stereotyping. We cannot be certain but we speculate that trust bears most directly on the link between self and other: high trust may entail a kind of merging with another ("I trust you to have my interests at heart") whereas low trust may entail a gulf between self and other. Trust may not be as central to the question of whether others are seen through the lens of a stereotype. Thus, trust may capture that part of perceived similarity that moderates projection but not fully capture what governs stereotyping. Future work may shed more light on the role of trust in mind-reading strategies.

A mind-reading view of strategic interaction

Scholars often speak of actors as "facing" conflicts and dilemmas, as if these situations were concrete realities, existing outside of and independent of the person. Yet actors interpret and mentally transform these situations, navigating strategic interactions according to their representations of them (see, e.g., Van Lange, 1999; Wyer, 1969). This notion is captured in one of the "Top Ten Open Research Questions" identified by Camerer (2003) in his survey of behavioral game theory, namely "What game do people think they are playing?" (p. 474). Camerer noted the value of developing theories of mental representations, including how people form mental models of payoffs, strategies, and counterparts. We believe that part of this involves one of the most fundamental processes of social judgment: *mind-reading*. To account for what happens and why in strategic interactions, scholars must account for how minds model other minds. We believe our results shed light on this part of the drama of strategic interaction.

Prior work has examined how players use their partner's behavioral evidence to intuit intentions (e.g., Kelley & Stahelski, 1970b; McCabe & Smith, 2003). Our results suggest that mind-reading does not wait for strategic interaction to begin. In the absence of direct behavioral evidence, our participants appeared to rely systematically on projection and stereotyping to infer counterpart mental states. These early inferences may be revised or overturned in the face of new evidence, as in Study 4. Yet, even if they are misguided, initial mind-reading may set off cycles of cooperation, capitulation, or belligerence that, through confirmation biases and self-fulfilling prophecies, take on a life of their own (e.g., Diekmann, Tenbrunsel, & Galinsky, 2003; Ferrin, Bligh, & Kohles, 2008). It seems clear that a promising direction would be to wed accounts of projection and stereotyping with models of behavior-based inferences, viewing the course of multi-round strategic interactions as a matter of pre-play mind-reading, followed by updating and learning based on behavioral evidence.

Concluding thoughts

Many scholars of strategic interaction are drawn to some version of a basic but vexing question: What begets cooperation? The list of answers that have been offered is long and spans many levels of analysis, ranging from love to net present value, and from oxytocin to selfish genes. There may never be a single best answer to this question. However, we are certain that this question will not be satisfactorily answered without an account of how minds model, or mismodel, other minds. It seems almost inevitable that people use multiple tools for this kind of mind-reading and so the answer will need to specify, in part, how and when a given tool for social inference is put to work and how and when that tool may be set aside.

Acknowledgments

This research was supported in part by Columbia University's Center for the Decision Sciences. The authors wish to thank Brian Lickel for thoughtful comments on the manuscript.

References

Acevedo, M., & Krueger, J. I. (2005). Evidential reasoning in the prisoner's dilemma game. *American Journal of Psychology, 118*, 431–457.
Ames, D. R. (2004a). Inside the mind-reader's toolkit: Projection and stereotyping in mental state inference. *Journal of Personality and Social Psychology, 87*, 340–353.
Ames, D. R. (2004b). Strategies for social inference: A similarity contingency model of projection and stereotyping in attribute prevalence estimates. *Journal of Personality and Social Psychology, 87*, 573–585.
Ames, D. R. (2005). Everyday solutions to the problem of other minds. In B. F. Malle & S. D. Hodges (Eds.), *Other minds: How human bridge the divide between self and others* (pp. 158–173). New York, NY: Guilford Publications.
Ames, D. R. & Mason, M. F. (in press). Mind perception. In S. Fiske & N. Macrae (Eds.), *The sage handbook of social cognition*. Thousand Oaks, CA: Sage.
Ames, D. R., & Johar, G. V. (2009). I'll know what you're like when I see how you feel: How and when affective displays adjust behavior-based impressions. *Psychological Science, 20*, 586–593.
Apperly, I. (2010). *Mindreaders: The cognitive basis of "Theory of Mind"*. Psychology Press.
Bhatt, M., & Camerer, C. F. (2005). Self-referential thinking and equilibrium as states of mind in games: fMRI evidence. *Games and Economic Behavior, 52*, 424–459.
Bottom, W. P., & Paese, P. W. (1997). False consensus, stereotypic cues, and the perception of integrative potential in negotiation. *Journal of Applied Social Psychology, 27*, 1919–1940.
Camerer, C. F. (2003). *Behavioral game theory: Experiments on strategic interaction*. Princeton: Princeton University Press.
Clement, R. W., & Krueger, J. (2002). Social categorization moderates social projection. *Journal of Experimental Social Psychology, 38*, 219–231.
Davis, M. H., Conklin, L., Smith, A., & Luce, C. (1996). Effect of perspective taking on the cognitive representation of persons: A merging of self and other. *Journal of Personality and Social Psychology, 70*, 713–726.
De Bruin, E. N. M., & Van Lange, P. A. M. (1999). Impression formation and cooperative behavior. *European Journal of Social Psychology, 29*, 305–328.
Diekmann, K. A., Tenbrunsel, A. E., & Galinsky, A. D. (2003). From self-prediction to self-defeat: Behavioral forecasting and the effect of competitive expectations. *Journal of Personality and Social Psychology, 85*, 672–683.
Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*, 57.
Epley, N., Caruso, E. M., & Bazerman, M. H. (2006). When perspective taking increases taking: Reactive egoism in social interaction. *Journal of Personality and Social Psychology, 91*, 872–889.
Ferrin, D. L., Bligh, M. C., & Kohles, J. C. (2008). It takes two to tango: An interdependence analysis of the spiraling of perceived trustworthiness and cooperation in interpersonal and intergroup relationships. *Organizational Behavior and Human Decision Processes, 107*, 161–178.
Galinsky, A. D., Maddux, W. W., Gilin, D., & White, J. B. (2008). Why it pays to get inside the head of your opponent: The differential effects of perspective-taking and empathy in strategic interactions. *Psychological Science, 19*, 378–384.
Heider, F. (1958). *The psychology of interpersonal relations*. Hillsdale, NJ: Lawrence Erlbaum.
Ickes, W. (2003). *Everyday mind reading: Understanding what other people think and feel*. Amherst, NY: Prometheus Books.
Jones, P. E. (2004). False consensus in social context: Differential projection and perceived social distance. *British Journal of Social Psychology, 43*, 417–429.
Katz, D., & Allport, F. H. (1931). *Student attitudes*. Syracuse, NY: The Craftsman Press.
Kelley, H. H., & Stahelski, A. J. (1970a). Errors in perception of intentions in a mixed-motive game. *Journal of Experimental Social Psychology, 6*, 379–400.
Kelley, H. H., & Stahelski, A. J. (1970b). The inference of intentions from moves in the prisoner's dilemma game. *Journal of Experimental Social Psychology, 6*, 401–419.
Kelley, H. H., & Stahelski, A. J. (1970c). Social interaction basis of cooperators' and competitors' beliefs about others. *Journal of Personality and Social Psychology, 16*, 66–91.
Kohlberg, E., & Mertens, J. (1986). On the strategic stability of equilibria. *Econometrica, 54*, 1003–1037.
Komorita, S. S., & Parks, C. D. (1994). *Social dilemmas*. Madison, WI: Brown & Benchmark.
Kopelman, S., Weber, J. M., & Messick, D. M. (2002). Factors influencing cooperation in Commons Dilemmas: A review of experimental psychological research. In E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, & E. U. Weber (Eds.), *The drama of the commons* (pp. 113–156). Washington, DC: National Academy Press.
Kray, L. J. & Thompson, L. (2005). Gender stereotypes and negotiation performance: A review of theory and research. In B. Staw & R. Kramer (Eds.), *Research in organizational behavior, 26*, 103–182.

Kray, L. J., Thompson, L., & Galinsky, A. (2001). Battle of the sexes: Gender stereotype confirmation and reactance in negotiations. *Journal of Personality and Social Psychology, 80*, 942–958.

Krueger, J. (2000). The projective perception of the social world. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 323–351). New York: Kluwer Academic/Plenum Publishers.

Krueger, J. I., & Acevedo, M. (2005). Social projection and the psychology of choice. In M. D. Alicke, D. Dunning, & J. I. Krueger (Eds.), *The self in social perception* (pp. 17–41). New York: Psychology Press.

Kunda, Z., Davies, P. G., Adams, B. D., & Spencer, S. J. (2002). The dynamic time course of stereotype activation: Activation, dissipation, and resurrection. *Journal of Personality and Social Psychology, 82*, 283–299.

Maki, J. E., & McClintock, C. G. (1983). The accuracy of social value prediction: Actor and observer influences. *Journal of Personality and Social Psychology, 45*, 829–838.

Malle, B. F. (1999). How people explain behavior: A new theoretical framework. *Personality & Social Psychology Review, 3*(1), 23–48.

Malle, B. F., & Hodges, S. D. (Eds.). (2005). *Other minds: How humans bridge the divide between self and other*. New York: Guilford Press.

McCabe, K. A., Rigdon, M. L., & Smith, V. L. (2003). Positive reciprocity and intentions in trust games. *Journal of Economic Behavior and Organizations, 52*, 267–275.

McCabe, K. A., & Smith, V. L. (2003). Strategic analysis by players in some games: What information do they use? In E. Ostrom & J. M. Walker (Eds.), *Trust and reciprocity: Interdisciplinary conceptual and empirical lessons*. New York: Russell Sage Foundation.

Meltzoff, A. N., & Brooks, R. (2001). 'Like me' as a building block for understanding other minds: Bodily acts, attention, and intention. In B. Malle, L. Moses, & D. Baldwin (Eds.), *Intentions and intentionality: Foundations of social cognition* (pp. 171–191). Cambridge, MA: MIT Press.

Messick, D. M., & Brewer, M. B. (1983). Solving social dilemmas: A review. *Review of Personality and Social Psychology, 4*, 11–44.

Mitchell, J. P., Macrae, C. N., & Banaji, M. R. (2006). Dissociable medial prefrontal contributions to judgments of similar and dissimilar others. *Neuron, 50*, 655–663.

Pennington, N., & Hastie, R. (1992). Explaining the evidence: Tests of the story model for juror decision making. *Journal of Personality and Social Psychology, 62*, 189–206.

Pinkley, R. L., Griffith, T. L., & Northcraft, G. B. (1995). 'Fixed pie' a la mode: Information availability, information processing, and the negotiation of suboptimal agreements. *Organizational Behavior and Human Decision Processes, 62*, 101–112.

Plous, S. (1985). Perceptual illusions and military realities: A social-psychological analysis of the nuclear arms race. *Journal of Conflict Resolution, 29*, 363–389.

Plous, S. (1993). The nuclear arms race: Prisoner's dilemma or perceptual dilemma? *Journal of Peace Research, 30*, 163–180.

Ross, L., Greene, D., & House, P. (1977). The "false consensus effect": An egocentric bias and social perception and attribution processes. *Journal of Experimental Social Psychology, 13*, 279–301.

Rothbart, M., & Hallmark, W. (1988). In-group–out-group differences in the perceived efficacy of coercion and conciliation in resolving social conflict. *Journal of Personality and Social Psychology, 55*, 248–257.

Sagar, H. A., & Schofield, J. W. (1980). Racial and behavioral cues in Black and White children's perceptions of ambiguously aggressive acts. *Journal of Personality and Social Psychology, 39*, 590–598.

Singer, T., & Fehr, E. (2005). The neuroeconomics of mind reading and empathy. *American Economic Review, 95*, 340–345.

Thompson, L. (1991). Information exchange in negotiation. *Journal of Experimental Social Psychology, 27*, 161–179.

Toma, C., Yzerbyt, V. Y., & Corneille, O. (2010). Anticipated cooperation vs. competition moderates interpersonal projection. *Journal of Experimental Social Psychology, 46*, 375–381.

Van Boven, L., Loewenstein, G., & Dunning, D. (2005). The illusion of courage in social predictions: Underestimating the impact of fear of embarrassment on other people. *Organizational Behavior and Human Decision Processes, 96*, 130–141.

Van Lange, P. A. M. (1992). Confidence in expectations: A test of the triangle hypothesis. *European Journal of Personality, 6*, 371–379.

Van Lange, P. A. M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation. *Journal of Personality and Social Psychology, 77*, 337–349.

Van Lange, P. A. M. & Kuhlman, D. M. (1990). Expected cooperation in social dilemmas: The influence of own social value orientation and other's personality characteristics. In P. Drenth, J. Sergeant, & R. Takens (Eds.), *European perspectives in psychology* (Vol. 3, pp. 239–250). New York: John Wiley & Sons.

Walters, A. E., Stuhlmacher, A. F., & Meyer, L. L. (1998). Gender and negotiator competitiveness: A meta-analysis. *Organizational Behavior and Human Decision Processes, 76*, 1–29.

Wyer, R. S. (1969). Prediction of behavior in two-person games. *Journal of Personality and Social Psychology, 13*, 222–228.