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Administrative Science Quarterly 2012 57: 269 originally published online 21 June 2012
DOI: 10.1177/0001839212453456

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Administrative Science Quarterly
57 (2)269–304
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DOI: 10.1177/0001839212453456
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Leigh Anne Liu,¹ Ray Friedman,² Bruce Barry,²
Michele J. Gelfand,³ and Zhi-Xue Zhang⁴

Abstract

This research examines the dynamics of consensus building in intracultural and intercultural negotiations achieved through the convergence of mental models between negotiators. Working from a dynamic constructivist view, according to which the effects of culture are socially and contextually contingent, we theorize and show in two studies of U.S. and Chinese negotiators that while consensus might be generally easier to achieve in intracultural negotiation settings than intercultural settings, the effects of culture depend on the epistemic and social motives of the parties. As hypothesized, we find that movement toward consensus (in the form of mental model convergence) is more likely among intracultural than intercultural negotiating dyads and that negotiators' epistemic and social motives moderated these effects: need for closure inhibited consensus more for intercultural than intracultural dyads, while concern for face fostered consensus more for intercultural than intracultural dyads. Our theory and findings suggest that consensus building is not necessarily more challenging in cross-cultural negotiations but depends on the epistemic and social motivations of the individuals negotiating.

Keywords: negotiation, culture, mental models, concern for face, need for closure

Negotiation is a communicative exchange (e.g., Putnam, 1983) through which participants "define or redefine the terms of their interdependence" (Walton and McKersie, 1965: 3). It is a pervasive form of social interaction that arises not just in formal arenas, such as international relations, industrial relations, and manager-subordinate relations, but also in informal contexts, such as

¹ Robinson College of Business, Georgia State University

² Owen Graduate School of Management, Vanderbilt University

³ Department of Psychology, University of Maryland

⁴ Guanghua School of Management, Peking University

interpersonal relations and marital decision making (Pruitt and Carnevale, 1993). Arriving at optimal outcomes depends, in part, on creating a common understanding of the situation (McGinn and Keros, 2002). As Van Boven and Thompson (2003), Olekalns and Smith (2005), and Swaab et al. (2002) found, consensus making provides the very basis for economic success in negotiations, at least for negotiations that have the potential for joint gain through log-rolling (in which each party gives up issues that are low in value for them but high in value to the other side) and information sharing. Dyads with more similar "mental models"—psychological representations of a situation (Craik, 1943)—are more likely to find joint gains than those whose mental models diverge (Van Boven and Thompson, 2003). Beyond negotiations, similarity in mental models has been shown to be critical for effective team functioning (e.g., Mathieu et al., 200; Lim and Klein, 2006) and has been studied in areas as diverse as natural resource management (Jones et al., 2011) and campus sustainability efforts (Olson, Arvai, and Thorp, 2011) to examine whether and how communities of people see problems in the same way. Techniques involving mental models have also been proposed as a way to overcome stakeholders' knowledge limitations in effective risk communication (Morgan et al., 2002).

The study of mental models and consensus building is especially important for cross-cultural negotiations. Prior research has revealed cultural variation in perceptions of uncertainty (Gudykunst and Nishida, 1984), persuasion and influence styles (Johnstone, 1989; Brett and Okumura, 1998), and judgment biases (Gelfand et al., 2001) and has identified systematic differences in cognitions (Nisbett, 2003) and values (Schwartz, 1994) when comparing people from different cultures. These variations should have a major impact on mental models in negotiation and help us understand why cross-cultural negotiations can be more difficult than within-culture negotiations. When negotiators from different cultures meet, their mental models are more likely to be different than when the other party is from the same culture, and these differences may account for variations in the quality of negotiation results. It is not only mental models at the outset of negotiation that matter most for the development of consensus, however; the critical process for consensus building is change in mental models, specifically their convergence, during the course of the negotiation. The process of mental model convergence and the effects of culture on that convergence are the focus of the theory developed below and the two studies we report.

The relationship between culture and consensus building via mental model convergence is complex because culture's effect on social interaction is not static or deterministic. The challenges encountered when managing negotiations cross-culturally do not inevitably inhibit negotiated agreements. Rather, the impact of culture depends on other individual and situational factors. Here, we adopted a dynamic constructivist view of cultural influence, which holds that culture affects individual cognition and behavior through the activation of knowledge structures via cultural, motivational, and contextual cues (e.g., Briley, Morris, and Simonson, 2000; Chiu et al., 2000; Hong et al., 2000; Morris and Fu, 2001; Morris and Gelfand, 2004; Fu et al., 2007). Dynamic constructivist research explores how behavioral propensities rooted in culture are altered by social experiences and motivational states (Morris, 2011).

Although there may be cultural differences in mental models, especially at the start of negotiation, we theorize that negotiators' tendency to constrain their views to culturally informed knowledge structures are likely to vary with individual needs and motivations, in particular, the need for closure which is a form of epistemic motivation (Webster and Kruglanski, 1994), and concern for face, a form of social motivation (Cheung et al., 1996). These motivational factors affect whether mental models converge during cross-cultural negotiations and, in doing so, influence the quality of the negotiated outcome. A dynamic constructivist view of culture helps us see that effects of cultural differences can be at times diminished and at times amplified. It is important, therefore, to look not just at how mental models may differ between negotiators from different cultures, but also at factors that enhance or constrain change and convergence in mental models in cross-cultural settings. This view moves beyond the simplistic assumption that all cross-cultural negotiations are alike and suggests that while cross-cultural negotiations do involve challenges, there are important factors that moderate these effects. We investigate these factors in two studies, which compare intra- and intercultural negotiating dyads.

CONSENSUS BUILDING AND CROSS-CULTURAL NEGOTIATIONS

Shared Mental Models

In literatures on communication and psychology, there is a rich and long-standing body of work showing how two parties interacting come to a common understanding of the situation (Grice, 1975; Clark and Brennan, 1991), sometimes called "grounding." The basic notion that individuals create meaning by building consensus around ideas developed in conversation traces back at least as far as the work of the early cognitive psychologist Frederic Bartlett (1967; cited in Kashima, 2000). This process of consensus building—of creating a collective purpose and understanding during conversation—is critical because "all collective actions are built on common ground and its accumulation" (Clark and Brennan, 1991: 127). This is no small accomplishment, as people in conversation have to come to a common understanding of both the content of the conversation (talking about the same thing) and the process of conversation (who talks, when, and how). They have to overcome many barriers, such as speakers' variability and lack of proximity (Kraljic, Samuel, and Brennan, 2008), as well as computer mediation (Brennan, 1998). Yet, more often than not, this process is successful, as the two parties attend to each other's statements, moves, and signals and adjust to each other.

Inherent in the process of consensus building is the convergence of mental models. Mental models are cognitive representations that help individuals make sense of a situation (Craik, 1943). Mental models include many interconnected elements of the situation perceived by the individual, forming a "network of elements" in which an element's meaning is derived from its structural relation to other elements (Carley and Palmquist, 1992).

Mental models share common features with but can be distinguished from other cognitive structures people use to make sense of their surroundings. These include scripts (Abelson, 1976), schemas (Brewer and Nakamura, 1984; Fiske and Taylor, 1991), frames (Minsky, 1975), and belief or knowledge structures (Fiske and Taylor, 1991). These concepts all pertain to processes through

which an individual sorts out information in his or her environment. Scripts are concerned with event sequences in linear temporal order and patterns that guide behavior (Schank and Abelson, 1977), while mental models are snapshots of perceived relationships at a given point in time. Knowledge structures emphasize the framework for organizing, relating, and retaining information in memory (Mayer, 1992), while mental models are the specific knowledge structures being used for sense making on a certain occasion. Schemas or frames represent established ways of perceiving a situation (e.g., having a "relationship" frame; Pinkley, 1995) that are not necessarily derived from the particulars of a situation, whereas mental models are built around the actual circumstances at a given point in a specific situation. Mental models differ from these other concepts in that mental models are situation dependent, the construction of a mental model yields an integrated network of relations among perceived elements in a situation, and therefore a mental model reflects a holistic and specific cognitive experience.

The elements of mental models include complex concepts with meanings that are independent of the structural links (e.g., Thompson and Loewenstein, 2003; Liu and Dale, 2009). In a negotiated exchange, the process of interacting should create shifts in perceptions such that mental models are more similar at the end of the negotiation than at the beginning of negotiations. Three comparisons between mental models in a situation like this are possible. First, each party comes to the situation with a pre-negotiation mental model; these models may be more or less different between the parties, in terms of which elements are seen as relevant, which are connected to each other, and which are more central. Second, the mental model held by one party before the negotiation may be more or less similar to that same party's model after the negotiation, indicating the degree of change in mental models that occurs for that individual as a result of the negotiation process. Third, the two parties' mental models after the negotiation can be assessed to determine how similar they are; if they are more similar after the negotiation, we say that the two parties achieved mental model convergence during the negotiation.

The convergence of mental models—the building of consensus and greater similarity in mental models—is critical in negotiation because when negotiators share mental models, they are better able to understand one another and better able to exchange information accurately and efficiently (Van Boven and Thompson, 2003). Self-verification theory holds that people seek out verifying information for epistemic and practical reasons. Knowing that one's beliefs are similar to others' helps feed perceptions that one's own beliefs are sensible; moreover, when interaction partners hold similar expectations and self-views, social interactions are less conflictual and better coordinated (Swann, Pelham, and Chidester, 1988). The similarity between an individual's self-views and others' appraisals of that individual constitutes the interpersonal congruence between them, which in turn promotes smooth and productive interactions (Polzer, Milton, and Swann, 2002). The similarity of mental models also fosters feelings of coherence, control, and predictability, enhancing understanding and collective efficiency (Swann, Stein-Steroussi, and Giesler, 1992). More similarity between the mental models of two negotiators creates a stronger basis for exchange that is more open and interactive, with a greater likelihood that one

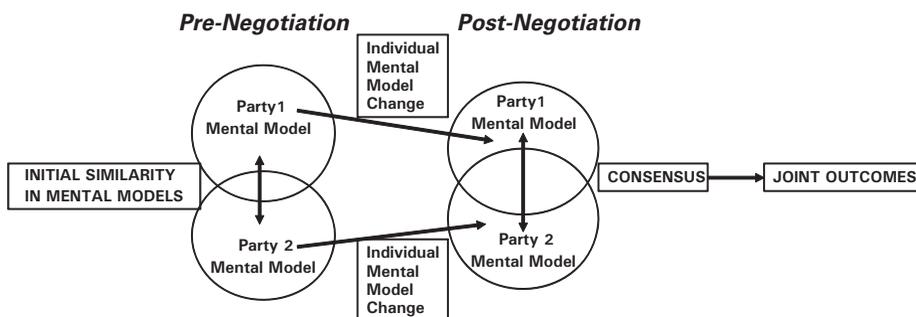
party will learn from the other. This can be especially important in negotiations in which there is a potential for joint gain.

Consensus based on similarity and adjustment of mental models can also affect the objective quality of the final results. Reduced to its essence, negotiation is a joint decision-making process aimed at allocating resources under conditions in which negotiators have divergent preferences and utilities (Bazerman and Carroll, 1987; Neale and Northcraft, 1991). Weingart and colleagues (Weingart et al., 1990; Weingart, Bennett, and Brett, 1993) showed that extensive information exchange generates trust and cooperation during the negotiation process, resulting in better outcomes for both parties when the negotiation has integrative potential. There is also evidence that negotiation pairs with higher summed perspective-taking ability (i.e., the ability to look at problems from another's perspective) achieve higher joint profits than pairs with lower summed perspective-taking ability (Kemp and Smith, 1994). When there is similarity among important elements of individuals' mental models, that similarity facilitates or, at a minimum, reflects understanding of each other's perspective.

We take as a starting point, therefore, the idea that interacting parties progressing toward mutually satisfactory outcomes harbor mental models that are more similar at the end than at the beginning of the interaction. Similarity or consensus in mental models, in other words, is a potential marker of progress toward mutual gain and mutual satisfaction to the extent that it reflects the coordination of communications between parties, more accurate interpretations of each other's interests and messages, and a mutual understanding of key issues during decision making. Several studies of mental models in negotiation between people in the same culture support this view, showing that when mental models converge, producing greater consensus in perceptions, negotiators are able to achieve higher levels of joint gain (Van Boven and Thompson, 2003; Olekalns and Smith, 2005; Adair and Brett, 2005). Figure 1 illustrates the consensus-building process resulting from change in mental models in the direction of convergence that these prior studies have supported. This foundation is a particularly useful base for studying consensus building in cross-cultural negotiations.

Culture has been conceptualized as "a loose network of domain-specific cognitive structures" (Hong and Mallorie, 2004: 63), including theories and beliefs that shape people's patterns of feeling, behaviors, systems of thinking,

Figure 1. Consensus Building in Mono-cultural Negotiation Research



and cognitive processes (Triandis, 1972; Hofstede, 1997; Nisbett et al., 2001). Culture influences factors and processes that are particularly relevant to decision making in general and negotiation in particular. This has been shown in studies of culture (e.g., Nisbett et al., 2001) and in studies of negotiators' perceptions (e.g., Mannix, Tinsley, and Bazerman, 1995; Brett and Okumura, 1998; Gelfand et al., 2001, 2002; Adair and Brett, 2005). Thus we can expect that negotiators from different cultures will have mental models that are more likely to differ from each other than will negotiators from the same culture. If convergence of mental models is key to negotiation outcomes involving mutual gains, achieving those outcomes is likely to be a greater challenge for negotiators who come from different cultures, because they will start with mental models that are more different and need to undergo greater change of mental models to achieve consensus.

But the effects of culture need not be regarded as static (e.g., Hofstede, 1980) or deterministic. A dynamic constructivist view of culture emphasizes the malleable nature of culture (Kashima, 2000), contending that the strength of culture's influence in a given moment or situation varies a great deal (e.g., Morris and Gelfand, 2004; Morris, 2011). For example, marketing research shows that the impact of culture on consumers' decision making can be amplified simply by requiring people to provide reasons for their choices (Briley, Morris, and Simonson, 2000). Cultural differences are also amplified by individuals' levels of need for closure (Fu et al., 2007; Chiu et al., 2000) and by requiring accountability for individual behavior (Gelfand and Realo, 1999; Liu, Friedman, and Hong, 2012). Thus the presence of differences in mental models at the start of cross-cultural negotiations may pose more or less of a challenge to the process of building consensus under different conditions. To understand how a convergence of mental models can be achieved even when large differences between models exist at the start of interaction, we need to assess factors that generally enhance or inhibit the flexibility of mental models in negotiation.

Motivation and Culture in Mental Models

Proposing a motivated information processing model, De Dreu and Carnevale (2003) suggested that interpersonal processes and outcomes are influenced by two types of motivations: epistemic motivation and social motivation. An important epistemic motivation is the need for closure, the motivation to reach judgments that are conventional and stable (Kruglanski, 1989: 236). Social motivation includes the concern for relations with others. De Dreu and Carnevale (2003) used a more specific definition of social motives, focused on the desire to help or hurt the payoff to the other party. While this particular expression of social motives is important for negotiation, the driver of the desire for those payoffs is concern for the quality of the relationship with the other party, which is core to the broader definition of "social motivations." We focus here on the broader definition of social motives. As Forgas, Williams, and Laham (2005: 5) put it, "humans need meaningful social contact, and the motivation for such contact is crucial to the maintenance of a healthy sense of adjustment and a sense of identity." One example of this type of social motivation is concern for face, which is the motivation to enhance one's self-image and avoid loss of reputation (Cheung et al., 1996). The epistemic motivation of need for closure and

the social motivation of concern for face are likely to have different effects on mental model convergence and consensus.

Need for closure. Need for closure is an individual characteristic pertaining to cognitive style that researchers have connected with both social interactions and culture. It is known to lead individuals to seek answers that concur with the group consensus (Kruglanski and Webster, 1996) and resolve conflicts (Fu et al., 2007). Having a high need for closure implies a lack of flexibility in dealing with uncertainty. Need for closure represents the desire for definite structure, an affective discomfort occasioned by ambiguity, urgency for closure in judgment and decision making, desire for predictability in future contexts, and closed-mindedness and unwillingness to be confronted (Kruglanski, Webster, and Klem, 1993; Webster and Kruglanski, 1994; Kruglanski and Webster, 1996). Individuals high in need for closure tend to “seize and freeze” information early on during social interaction (De Dreu, Koole, and Oldersma, 1999). Consequently, once one has frozen a mental model, he or she is more likely to dismiss information inconsistent with the model and less likely to adapt to new information than those who are low in need for closure (Kruglanski, 1989; Kruglanski and Webster, 1996; Jost, Kruglanski, and Simon, 1999; De Dreu, Koole, and Oldersma, 1999).

Thus we expect that change in mental models will be lower for those high in need for closure, and as a result, consensus between interacting parties at the conclusion of negotiation will be less among those who are higher in need for closure than those who are lower in need for closure. Because consensus leads to more desirable joint outcomes, if high need for closure is associated with less change in mental models and less consensus, then we would expect joint outcomes to be lower for negotiators with high need for closure.

Hypothesis 1a: Individual change in mental models during a negotiation is smaller for negotiators high in need for closure than for negotiators low in need for closure.

Hypothesis 1b: Consensus (or convergence in mental models between negotiators) at the end of the negotiation is less in dyads of individuals with higher need for closure than dyads of individuals with lower need for closure.

Hypothesis 1c: Joint outcomes are lower for negotiating dyads of individuals with higher need for closure.

Need for closure and cultural match. Though need for closure has effects on negotiations in general, we expect that the effect will be especially strong in intercultural negotiations, in which there is a weak cultural match between negotiators. In intercultural interactions, heightened need for closure will lead negotiators not only to “freeze” the mental model early but also to instigate stereotypical judgments toward culturally distant others because they feel negatively disposed toward those with different opinions and cultural traits (Kruglanski and Webster, 1996). Adherence to group norms provides cognitive closure (Kruglanski et al., 2006), which should be comforting for those with high need for closure facing uncertain situations such as an intercultural negotiation. Freezing the mental model makes it difficult to absorb new information or update one’s analysis of the negotiation and leads one to forego

opportunities to discover integrative potentials that can lead to joint gains. Therefore high need for closure makes it more difficult to reach agreement, and more so in intercultural negotiations.

Research has shown that high need for closure tends to amplify cultural tendencies (Chiu et al., 2000; Fu et al., 2007), and this appears especially true for those who desire consistent cultural identity (Hong et al., 2003). Fu et al. (2007: 203) argued that high need for closure activates cognitions that are conventional in one's home culture and thereby provides the "epistemic security of consensual validation." Thus in intercultural situations, individuals high in need for closure may exhibit an additional layer of rigidity on top of the general rigidity we would expect for those with high need for closure. Cultural tendencies toward change of mental models over the course of the negotiation and the quality of outcomes in negotiations are amplified when need for closure is high and the negotiation context is intercultural.

Hypothesis 1d: The negative effect of high need for closure on consensus is stronger for intercultural negotiation pairs than for same-culture pairs.

Hypothesis 1e: The negative effect of high need for closure on joint outcomes is stronger for intercultural negotiation pairs than for same-culture pairs.

Concern for face. Concern for face, a form of social motivation, is an individual characteristic that encompasses motivation to enhance one's public image and to avoid a loss of reputation (Goffman, 1959; Ting-Toomey, 1988; Cheung et al., 1996; Earley, 1997). Face represents a claimed sense of self in a relational situation. Ting-Toomey (1988) argued that even though those in intercultural encounters differ in the way they manage face, face is a universal phenomenon in that everyone prefers to be respected, and everyone benefits from a sense of self-respect. Although the concept of face has its origin and holds more importance in Asian cultures (Hu, 1944), measures of face as an individual difference construct have been validated in both Eastern and Western cultures (Ting-Toomey et al., 1991; Cheung et al., 1996, 2001; Liu, Friedman, and Chi, 2005). Many texts have emphasized the importance of dealing with the other parties' face in conflict management and negotiation in order to recognize and respect their social identity and status (e.g., Brett, 2001).

In contrast with need for closure, which is theorized epistemically to hinder mental model convergence, concern for face should facilitate the convergence of mental models. As a reflection of one's desire for social acceptance, concern for face is associated with a claimed sense of social esteem that an individual wants others to have for him or her. Face is a vulnerable identity resource in social interaction because it can be enhanced, threatened, or bargained over (Ting-Toomey, 1988; Erez and Earley, 1993; Crockett and Ting-Toomey, 1994; Earley, 1997). Because high concern for face indicates that one is more sensitive to how others view him or her, we expect greater awareness of the other party and his or her needs among individuals high in concern for face. Cheung et al. (1996, 2001) found that concern for face is linked to higher levels of interpersonal relatedness, relationship orientation, and social sensitivity. Given this added attention to the other party, concern for face ought to enhance convergence of mental models with effects that are the inverse of need for closure.

Hypothesis 2a: Individuals' mental model change during negotiation is larger for those high in concern for face than for those low in concern for face.

Hypothesis 2b: Consensus (or mental model convergence between parties) at the end of a negotiation is greater in dyads composed of individuals with higher concern for face than dyads composed of individuals with lower concern for face.

Hypothesis 2c: Joint outcomes are greater for negotiation dyads composed of individuals with higher concern for face.

Concern for face and cultural match. Concern for face, as a manifestation of social motivation, encourages pro-social behaviors and attention to others, which leads to more information absorption and opportunities to discover integrative potential in negotiation. We expect that these effects will be especially strong in intercultural negotiations. Given greater initial differences in mental models between the two parties in intercultural situations, convergence requires more individual mental model change over the course of the interaction; in that situation, the amount of perceptual and cognitive attention paid to the other party can be especially beneficial. In intercultural negotiations, individuals experience a heightened awareness of self-identity, because they may attempt to be positive role models of their culture (Latane, 1981), as well as a heightened awareness of how others perceive their culture. Negotiators with high concern for face will see the intercultural situation as an especially important opportunity to display the positive side of their culture and personality, while those with lower concern for face may attend less to situational differences between intercultural and same-culture contexts. Accordingly, we propose that intercultural negotiation provides a context in which the effects of concern for face on mental models will be amplified.

Hypothesis 2d: The positive effect of high concern for face on consensus is stronger for intercultural negotiation pairs than for same-culture pairs.

Hypothesis 2e: The positive effect of high concern for face on joint outcomes is stronger for intercultural negotiation pairs than for same-culture pairs.

METHODS

Pilot Study

We conducted a pilot study to establish the measurement of mental models within a two-party negotiation simulation called *Cartoon* (Brett and Okumura, 1999). The simulation involves the sale of syndicated rights of a children's television cartoon. Participants in the U.S. and in China were assigned to either the buyer or seller role and were given confidential role information, in their native languages, the day before the negotiation. The seller is a major film production company that is prepared to negotiate a fixed five-year, 100-episode contract. The buyer is an independent television station in a large metropolitan area. The parties negotiate five issues. One issue is distributive: the price of each episode. Two integrative issues—financing terms and runs (the number of times each episode may be shown in the five-year period)—create a logrolling opportunity: it is more important for the seller to have payment up front and for the buyer to have a greater number of runs. There is one common-value issue:

another cartoon ("Strum"), which will be available in the future, with the potential to add value for both parties. The last issue is an opportunity to fashion a contingent contract (Bazerman and Gillespie, 1999) if the parties realize the potential to base payments on their different rating expectations. This simulation was ideal for this research for two reasons. First, it is well suited to a study of mental models because it covers multiple issues in a way that compels both parties to use relatively sophisticated thinking processes and provides opportunities for measuring a variety of mental model patterns. Second, other scholars have found it well suited to cross-cultural research (e.g., Brett and Okumura, 1998; Adair and Brett, 2005). With children's television cartoons common in most countries, the Cartoon negotiation is salient in both same-cultural and intercultural negotiation. At the time of our study, the Chinese version of the Cartoon negotiation had been translated, back-translated, and validated for its conceptual and structural equivalence to the English version (Brislin, 1986; Zhang and Han, 2007).

Identifying mental model elements in the Cartoon negotiation. Because mental models are conceptualized as networks (Carley and Palmquist, 1992), we used network analysis techniques (e.g., UCInet; Borgatti, Everett, and Freeman, 2002) to investigate empirically how concepts are connected to each other and which ones are more central to negotiators (Freeman, 1979; Scott, 2000). Because mental models are subjective and situation dependent, studying them empirically presents a significant challenge—it is impossible to measure exactly what goes on in someone's mind. Nevertheless, research on cognitive maps, social networks, and social cognition has led to the development of two techniques that elicit the elements of a knowledge network from an individual's perception: concept mapping and paired judgments (Collins and Quillian, 1969; Novak, 1990; Wandersee, 1990; Huff, 1990; Mathieu et al., 2000; Van Boven and Thompson, 2003; Kane and Trochim, 2006). In the pilot study, we used the qualitative technique of concept mapping to generate inductively a list of unique concepts associated with the Cartoon negotiation simulation and a set of general categories of mental model elements. Those concepts and categories were used in Study 1 for the quantitative measurement of mental models through the technique of paired judgments. We used the categories of mental model elements in Study 2.

Concept mapping provides an intuitive and qualitative measure of mental models through graphic representation that utilizes spatial thinking (Kane and Trochim, 2006). The advantage of concept mapping is that it is qualitative and open ended, allowing participants to report on their concept map any ideas or issues that they see as relevant to the negotiation. Forty-eight participants, 24 at two U.S. universities and 24 at two similar Chinese universities, were asked to complete a concept map of the Cartoon negotiation before the negotiation started. The instructions on how to create a concept map were as follows: (1) think about concepts that are important to this negotiation; (2) spatially arrange these concepts, and (3) link the concepts based on how they relate to each other. The instructions included a concept map of "plants" (Novak, 2000) as an example. The result was that each participant produced a diagram representing his or her mental model of the concepts relevant to this negotiation, including whether or not each concept was related to each other concept.

After creating the concept map, participants negotiated in pairs. At the conclusion of the negotiation, they were asked to create another concept map, even if they thought they had the same concept map as before the negotiation. It took the participants 5 to 20 minutes to create each concept map. The first author then debriefed them about the negotiation and interviewed the participants to learn about their experience. As long as a concept appeared in any of the lists provided by the participants, we included it in the final list, although we did collapse concepts with the same root; for example, we put "relation," "relational issues," and "relationship" together for "relationship with the other party." Together, the American and Chinese participants came up with 11 unique concepts for the Cartoon negotiation (1) *Price/episode*, (2) *Financing terms*, (3) *Runs/episode*, (4) *Second cartoon*, (5) *Rating*, (6) *Win-win*, (7) *Competition*, (8) *Profit of my company*, (9) *Relationship with the other party*, (10) *My emotions*, and (11) *Other party's emotions*. This set of concepts was then used in Study 1, in which we employed the paired judgment method to measure mental models. The paired judgment method is more manageable in a large-scale study than the concept mapping approach, because the set of concepts available to all participants is the same. We categorized these mental model elements into informational, relational, and emotional element categories that included both case-specific and general concepts. We used these categories to generate mental model elements in Study 2, which involved use of a different negotiation simulation.

Overview of Research

Based on the measures established in the pilot study, we conducted two studies, using different negotiation scenarios, to test our hypotheses and validate the findings. The first study, as in the pilot study, used the Cartoon negotiation (Brett and Okumura, 1999), and the second study used a modified version of a simulation known as the Alpha Beta Robotics negotiation (Gladwin, Weiss, and Zerkin, 2003). Data for both studies were collected from the U.S. and China and included three cultural conditions: American same-culture negotiations, Chinese same-culture negotiations, and American-Chinese intercultural negotiations. Same-culture negotiations were conducted in the U.S. and China, in English or Chinese, respectively. The intercultural negotiations were conducted in the U.S. in English, but all Chinese negotiators in the intercultural negotiations were provided with both the English and Chinese versions of the materials. These Chinese negotiators were graduate professional students or post-doctoral research associates in highly selective and competitive programs at major U.S. universities. They had all been in the U.S. for less than three years, so they were not so distant from their cultural roots and could fairly represent "Chinese" negotiators. Also, given their admission to major U.S. universities, they were proficient in English. All participants reported having had a previous negotiation class or workshop training and experience, and all had at least a bachelor's degree. The participants with a background in science noted that their previous negotiation training and experience were from negotiation or conflict management workshops offered either on campus or at their professional development conferences. Table 1 shows the demographic details of each study group.

Table 1. Demographic Descriptions of Participants in All Study Groups

Study	N	Culture	Mean age (yrs.)	Gender	Mean work experience	Major area of academic study
Pilot study	48	24 American 24 Chinese	31.2	31% female	6.7 yrs	64% business, 19% law, 17% science
Study 1						
American intracultural	82	82 American	35.8	35% female	8.8 yrs	76% business, 24% law
Chinese intracultural	152	152 Chinese	33.9	37% female	8.3 yrs	65% business, 23% law, 12% science
Intercultural	60	30 American 30 Chinese	31.7 31.3	40% female 33% female	6.9 yrs 6.1 yrs	50% business, 30% law, 20% science
Study 2						
American intracultural	38	38 American	33.2	40% female	7.8 yrs	100% business
Chinese intracultural	36	36 Chinese	29.7	47% female	6.9 yrs	100% business
Intercultural	36	18 American 18 Chinese	32.9 32.1	44% female 39% female	7.6 yrs 7.2 yrs	92% business, 8% science

STUDY 1

Participants and Procedures

All 294 participants in this study were volunteers who were either enrolled in graduate professional programs or were post-doc fellows in business, law, and science in two professional schools in the U.S. and two equivalent schools in China. The participants were recruited through professors who were teaching negotiation, mediation, or campus-wide negotiation and conflict management workshops. We had 41 American pairs and 86 Chinese pairs in intracultural settings, and 30 intercultural pairs. Participants in same-cultural conditions participated for extra credit in their respective business, law, negotiation, mediation, or conflict management classes. Each participant in the intercultural condition received \$25 as remuneration.

In all three conditions of this study, the participants provided demographic information and completed the Schwartz Value Survey (Schwartz, 1992) to assess cultural differences seven to ten days before the negotiation. All participants received role materials and a pre-negotiation questionnaire measuring their pre-negotiation mental models two to three days before the negotiation. At the negotiation session, responses from the pre-negotiation questionnaire were collected before the negotiation started. Participants were told that they had up to 60 minutes to engage in the negotiation; most pairs were finished after 45 minutes. Immediately following the negotiation, the participants submitted a form recording their agreement and then completed the post-negotiation questionnaire, which included measures for post-negotiation mental models and questions about satisfaction with the negotiation outcome, satisfaction with the negotiation process, and expectation for a future relationship. At their option, participants were either debriefed in a session following the negotiation or received a summary of the debriefing materials via e-mail. The first author fielded follow-up questions from participants by e-mail.

Measures

Mental models. We used the technique of paired judgments (Mathieu et al., 2000) to measure mental models. Concept mapping in the pilot study generated 11 items for the Cartoon negotiation; participants in this study made paired judgments based on these 11 elements from the concept maps. Whereas the concept mapping approach identifies two concepts that are related in a subject's mind by having him or her draw a link in a diagram, the paired judgment method identifies a link by having the participant evaluate every feasible pairing among concepts and score them in terms of how related or unrelated each pair is. Given that we had identified 11 concepts in the Pilot Study, there were 55 conceptual pairs $[(11 \times 10)/2]$. These were presented to participants with random ordering both by pairs and within pairs. Participants were asked to rate the relatedness of each pair of concepts on a 9-point scale from -4 (negatively related, a high degree of one requires a low degree of the other) to $+4$ (positively related, a high degree of one requires a high degree of the other) (Mathieu et al., 2000). With this procedure, as with concept mapping, we were able to capture the pattern of relationships among key concepts the participant saw in this negotiation. What the paired judgment procedure provides that concept mapping does not provide is a participant's sense of how strong a given relationship is. In concept mapping, we know if participants saw a link or not, but not if some ties were deemed stronger while others were deemed weaker. The result for each participant was a matrix showing his or her perceived set of "concept relatedness" that could be analyzed using social network analysis; we used UCINet6 (Borgatti, Everett, and Freeman, 2002).

Mental model similarities, consensus, and change. We used the Quadratic Assignment Procedure (QAP) within UCINet6's consensus analysis to create an index of convergence and association between two networks (i.e., between the mental models of two individuals in a negotiating dyad or between one individual's mental model before the negotiation and his or her mental model after the negotiation). Data from the participants' paired judgments were first converted to matrices to provide input for QAP, which generates the correlation between two matrices and assesses correlations between a cell/element in one network with cells in another network (Hubert and Schultz, 1976; Krackhardt, 1987, 1988; Borgatti, Everett, and Freeman, 2002). The QAP algorithm first computes a Pearson correlation coefficient, as well as a simple matching coefficient, between corresponding cells in the two data matrices. Then it randomly permutes rows and columns (synchronously) of one matrix and recomputes the correlation. This second step iterates hundreds of times in order to compute the proportion of times that a random correlation is larger than or equal to the observed correlation calculated in step one. A low proportion ($< .05$) suggests a strong relationship between the matrices that is unlikely to have occurred by chance. We used the QAP correlation (QAPr) as the measure of similarity of participants' mental models at the beginning of the negotiation and consensus at the end of the negotiation. For the same negotiator, the similarity between his or her mental models pre-negotiation and post-negotiation shows how much his or her mental model changed: the more similarity, the less change. We used $[1 - \text{QAPr}]$ to calculate mental model change.

Figure 2. Sample pre- and post-negotiation mental models for buyer and seller in Cartoon Negotiation.

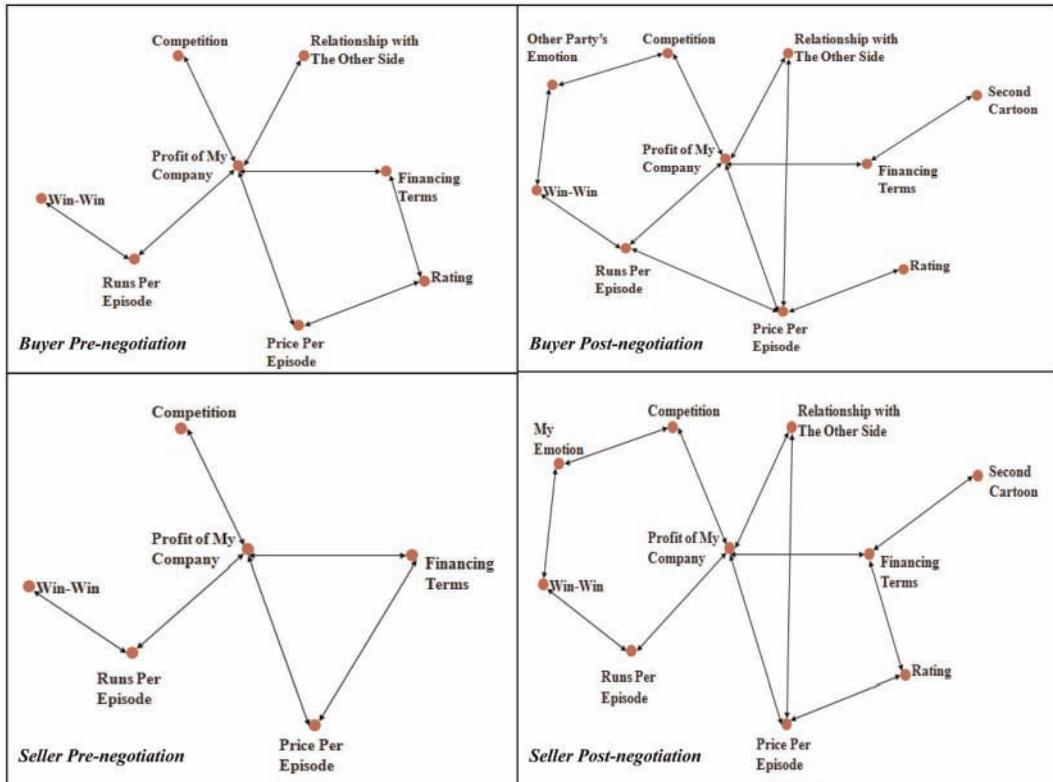


Figure 2 provides samples of mental models illustrating change and convergence from pre- to post-negotiation.

Social and epistemic motivation. We measured concern for face (CFF) using the 11-item scale from Cheung et al. (1996), with both Chinese and English versions three to seven days before the negotiation. We measured need for closure (NFC) using a 12-item instrument originally developed in English (Neuberg, Judice, and West, 1997). Based on methodological guidelines provided by Brislin (1986), it was translated into Chinese and back-translated by bilingual translators to ensure semantic equivalence between the two versions. Cronbach's alpha for concern for face and need for closure in Study 1 ($N = 294$) was .83 and .79 overall, respectively, and above .75 in any subgroup.

Negotiation outcomes. All pairs reached agreement. We measured two joint outcomes. First, the economic outcomes of the negotiation came from the payoff structure built into the Cartoon negotiation; we calculated a percentage of each pair's joint gains against the potential maximum gains (Liu, Chua, and Stahl, 2010). Second, we used a three-item measure for individual

satisfaction with the negotiation, including satisfaction with the negotiation process, outcome, and expectation for future relationships (Oliver, Balakrishnan, and Barry, 1994; Liu, Chua, and Stahl, 2010); Cronbach's alpha for the overall sample was .81. We aggregated satisfaction within dyads for all dyad-level analyses. In dyad-level analyses, we treated need for closure, concern for face, satisfaction, and joint gains as additive constructs, while consensus was measured directly at the dyad level (Kozlowski and Klein, 2000).

Other measures. We used the 57-item Schwartz Value Survey (Schwartz, 1992) to confirm that American and Chinese participants were culturally different. This survey measures six culture-level values (embeddedness vs. autonomy, hierarchy vs. egalitarianism, mastery vs. harmony) and ten individual-level values (self-direction, conformity, power, achievement, hedonism, stimulation, universalism, benevolence, tradition, and security) that can be clustered into four higher-level values: self-transcendence, openness to change, self-enhancement, and conservation. Values of Cronbach's alpha for the ten individual-level cultural values were above .78 for the whole sample as well as for any subgroup: American same-culture, Americans in intercultural, Americans in both same-culture and intercultural negotiation, Chinese in same-culture, Chinese in intercultural, Chinese in both same-culture and intercultural, both Americans and Chinese in same-culture and intercultural negotiations.

We collected demographic information on age, gender, education, and work experience. All of these measures were completed by participants before the negotiation. Table 2 shows the descriptive statistics and intercorrelations among variables involved in the study at the individual level.

Validation of Assumptions and Cultural Profiles

Before testing our hypotheses, we tested core assumptions regarding cultural differences and mental models. First, we expected that Chinese and American samples would vary on cultural values. Consistent with that expectation, we found significant differences between our American and Chinese samples along values of the Schwartz inventory, showing that the sample embodied theoretically expected cultural differences used to justify our hypotheses. Specifically, Americans value self-transcendence (mean_{American} = 5.89, S.D. = 1.75; Mean_{Chinese} = 3.71, S.D. = 1.03; 13.45, d.f. = 292, $p < .01$) and openness to change (mean_{American} = 5.52, S.D. = 1.76, mean_{Chinese} = 3.98, S.D. = 1.25; $t = 8.75$, d.f. = 292, $p < .01$) more than Chinese, while Chinese value conservation (mean_{American} = 3.09, S.D. = 1.63; mean_{Chinese} = 5.82, S.D. = 2.81; $t = 9.36$, d.f. = 292, $p < .01$) and self-enhancement (mean_{American} = 5.09, S.D. = 2.05; mean_{Chinese} = 5.67, S.D. = 2.11; $t = 2.32$, d.f. = 292, $p < .05$) more than Americans. In addition, we compared Chinese negotiators based in the U.S. with Chinese negotiators based in China, because those in the U.S. might have already become more westernized. We did not find statistically significant differences in values between these two sets of Chinese study participants.

Next, we tested the assumption that there were different patterns in American and Chinese negotiators' mental models. We did so by comparing the centrality of elements within American vs. Chinese mental models. Centrality captures the extent to which an element is seen by the individual as

Table 2. Overall Descriptive Statistics and Intercorrelations for Study 1 (N = 294)*

Variable	Mean	S.D.	1	2	3	4	5	6	7	8
1. Gender (female)	36%									
2. Age	35.23	6.32	.03							
3. Education	3.86	.59	.07	.10						
4. Work experience	8.07	5.85	.12	.23**	-.09					
5. Need for closure	3.60	.83	-.08	.02	.11	.10	(.79)			
6. Concern for face	5.05	1.02	.05	-.05	.08	-.08	.07	(.83)		
7. Price/episode	22.15	5.07	.02	-.05	.00	.09	.08	.07		
8. Financing terms	18.32	4.31	-.07	.02	-.05	.03	.09	.08	.47**	
9. Runs/episode	17.01	5.73	.02	.04	.02	-.02	-.08	.08	-.32**	.31**
10. Second cartoon (Strum)	10.92	4.88	.03	-.01	.02	.00	-.03	.10	.19*	.08
11. Rating	12.76	3.33	.03	.04	.01	.05	-.24**	-.03	-.07	.08
12. Profit of my company	21.00	4.15	-.06	.05	-.03	.05	.15*	.14*	.41**	.25**
13. Competition	30.21	6.61	-.05	-.05	.03	-.04	.12*	-.09	.45**	.33**
14. Win-win	29.48	7.53	.04	.01	-.06	.01	.07	.17*	.25**	.32**
15. Relationship with other party	21.17	6.26	.03	-.03	.02	.01	-.04	.15*	.11*	.18*
16. My emotions	3.86	1.02	-.07	-.08	.03	.01	.05	.07	-.02	-.03
17. Other party's emotions	3.17	1.02	-.06	-.08	.04	.04	.02	.06	-.01	.03
18. Individual mental model change	.58	.33	.05	.08	.04	.04	-.39**	.22**	.15*	.15*
19. Satisfaction	5.09	3.39	.06	-.05	-.05	-.07	-.06	-.07	.12*	-.08

Variable	9	10	11	12	13	14	15	16	17	18	19
10. Second cartoon (Strum)	.11*										
11. Rating	.23**	.09									
12. Profit of my company	.15*	.16*	.22**								
13. Competition	.22**	.12*	.28**	.42**							
14. Win-win	.17*	.21**	.31**	-.19*	-.20**						
15. Relationship with other party	.15*	.17*	.30**	-.18*	-.21**	.38**					
16. My emotions	-.01	.02	.03	-.03	-.03	.02	.02				
17. Other party's emotions	-.01	-.01	.03	-.02	-.03	.02	.02	.11*			
18. Individual mental model change	.18**	.17**	.08	.13*	.12*	.17**	.20**	.12*	.15*		
19. Satisfaction	-.08	.11*	.05	.14*	-.15*	.15*	.17*	.08	.08	.15*	(.75)

* $p < .01$; ** $p < .001$.

* Numbers on the diagonal, in parentheses, are Cronbach's alphas. Variables #9-19 are mean centrality scores obtained from UCINet for post-negotiation mental models.

related to many other elements in the mental model. In social networks, for example, centrality summarizes the connections through which individuals or entities interact or otherwise act interdependently; a node's high degree of centrality is an indicator of its structural influence. In the case of a negotiator's mental model, more centrality signifies a concept's relative importance in his or her understanding of the negotiation. For our purpose, degree centrality is measured by the number of links from the central element to other elements. In other words, an element is central when it stands at the center of attention and has a large number of connections with other elements (Scott, 2000). In an analysis of variance on measures of pre-negotiation centrality, we found significant differences in element centralities between American and Chinese mental models. Specifically, the centralities of "price" (the distributive issue) and "competition" were both generally higher among American than Chinese negotiators ($p = .07$ and $.02$, respectively). The centrality of "runs" and "financing"

(the integrative or trade-off issues), "second cartoon" (the common value issue), "win-win," and "relationship with the other party" were generally higher among Chinese than Americans ($p = .06, .06, .05, .07,$ and $.03,$ respectively).

Finally, we revisited our assumption that the mental models of negotiating parties progressing toward mutually satisfactory outcomes (that is, those that reach an agreement) are more similar at the end of the negotiation than at the beginning. Using all 147 dyads in the main study, we found that the average buyer-seller similarity is smaller before the negotiation ($QAPr = .20, p < .05$) than after it ($QAPr = .33, p < .01$). The difference is significant ($Z = 5.82, p < .01$), indicating that mental models tend to shift in the direction of convergence in negotiations in which agreement is likely, validating the assumptions embedded in figure 1, above. We also assumed that cross-cultural negotiators have mental models that are more different than same-culture negotiators. Supporting this assumption, we found that mental model similarity between cross-cultural negotiators was lower than mental model similarity between same-culture negotiators at the beginning of the negotiation ($.15$ vs. $.32, Z = 6.01, p < .01$).

Results

We predicted that need for closure (NFC) would have a negative effect on mental model change (hypothesis 1a). Table 2 showed that at the individual level, the correlation between NFC and individual mental model change is $-.39$ ($p < .001$). Because negotiators were nested in dyads, we also examined the correlation between NFC and individual mental model change separately for buyers ($-.39, p < .001$) and sellers ($-.37, p < .001$). These results support hypothesis 1a.

To test hypothesis 1b, that negotiators with higher need for closure would reach less consensus, we examined the relationship between aggregated dyadic need for closure and dyad consensus, using regression. That is, within each dyad, we combined the need for closure scores for buyer and seller. Results are shown in table 3. These tests show that controlling for pre-negotiation mental model similarity, dyadic need for closure has a negative relationship with consensus ($\beta = -.26, p < .01$), suggesting less consensus for high need for closure negotiators, supporting hypothesis 1b.¹ Testing hypothesis 1c, dyadic-level need for closure showed a negative effect on joint gain ($\beta = -.22, p < .01$) and dyadic satisfaction ($\beta = -.21, p < .01$), providing support for this hypothesis.

To test hypotheses 1d and 1e, we examined interactions between aggregated need for closure and cultural condition (same-culture vs. intercultural) using regression analysis. As shown in table 3, the interaction effect is

¹ Because our data contain both individual-level and dyad-level variables, we also tested the hypotheses using two alternative methods: (1) multilevel analyses with the program Mplus (Croon and van Veldhoven, 2007; Lüdtke et al., 2008; Muthén and Muthén, 2010) and (2) clustering individual-level variables into high (one S.D. or more above the mean) or low (one S.D. or more below the mean) categories and then comparing differences between the corresponding dyad-level variables. The first alternative analysis allowed us to predict consensus (a dyad-level dependent variable) with individual-level need for closure. The second alternative analysis allowed us to compare the degree of consensus of dyads that were both high on need for closure, both low on need for closure, and high/low on need for closure. These alternative analyses were conducted for all hypotheses, involving both need for closure and concern for face, with results from both methods consistent with the main analyses in all cases. Details are available upon request from the authors.

Table 3. Regression Analysis of the Interactive Effects of Need for Closure (NFC), Concern for Face, (CFF) and Cultural Conditions in Study 1*

Variable	Consensus		Joint Gains		Aggregated Satisfaction	
	H1b Step 1	H1d Step 2	H1c Step 1	H1e Step 2	H1c Step 1	H1e Step 2
Pre-negotiation similarity	.23*	.22*	.25**	.21**	.22**	.22**
Aggregated NFC	-.26*	-.23*	-.22*	-.21*	-.21*	-.20*
Cultural conditions		-.18*		-.18*		-.16*
Agg. NFC x Cultural conditions		-.19*		-.17*		-.18*
ΔR^2		.09**		.07**		.07**
Adjusted R ²	.17	.26	.16	.23	.16	.23
D.f.	2, 145	4, 143	2, 145	4, 143	2, 145	4, 143

Variable	H2b Step 1	H2d Step 2	H2c Step 1	H2e Step 2	H2c Step 1	H2e Step 2
	Pre-negotiation similarity	.23*	.22*	.25**	.21**	.22**
Aggregated CFF	.23*	.21*	.21*	.22*	.25*	.23*
Cultural conditions		-.17*		-.17*		-.17*
Agg. CFF x Cultural conditions		.15*		.16*		.18*
ΔR^2		.08**		.06**		.07**
Adjusted R ²	.15	.23	.16	.22	.16	.23
D.f.	2, 145	4, 143	2, 145	4, 143	2, 145	4, 143

* $p < .01$; ** $p < .001$.

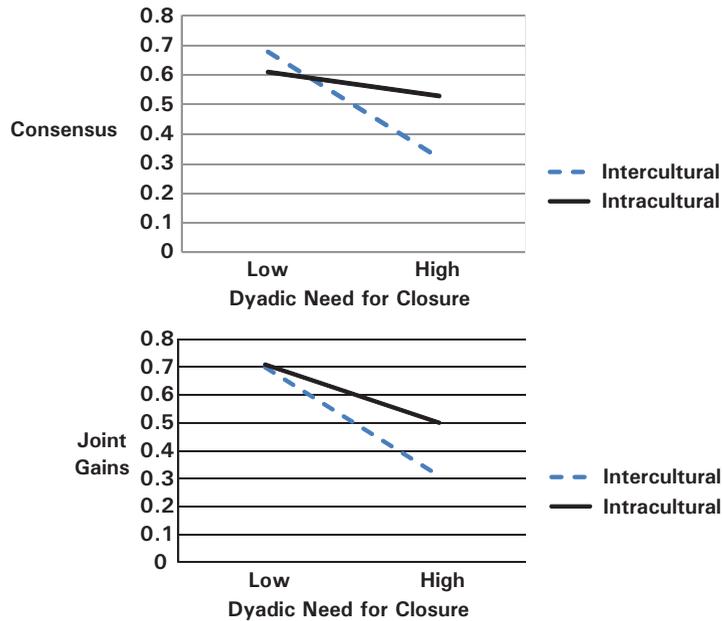
* Cultural conditions were coded 0 = intracultural and 1 = intercultural.

significant for consensus ($\beta = -.19$, $p < .01$), joint gain ($\beta = -.17$, $p < .01$), and dyadic satisfaction ($\beta = -.18$, $p < .01$), showing that the negative effects of need for closure on consensus and joint gain are stronger for intercultural negotiations, supporting hypotheses 1d and 1e. Using the Aiken and West (1991) method, we illustrate these interactions in figure 3, which shows that NFC is more predictive of consensus and joint gains when negotiation is intercultural rather than same-culture.

To test hypotheses regarding concern for face (CFF), we performed analyses that parallel those reported for need for closure. Table 2 showed that at the individual level, the correlation between concern for face and individual mental model change is significant and positive (.22, $p < .001$). The correlation between concern for face and individual mental model change is also positive looking just at buyers (.26, $p < .001$) and sellers (.23, $p < .001$). These results provide support for hypothesis 2a. The bottom half of table 3 shows that controlling for pre-negotiation mental model similarity, dyad-level concern for face is positively related to consensus ($\beta = .23$, $p < .01$), supporting hypothesis 2b. Dyad-level concern for face shows positive effects on joint gain ($\beta = .21$, $p < .01$) and dyadic satisfaction ($\beta = .25$, $p < .01$), supporting hypothesis 2c.

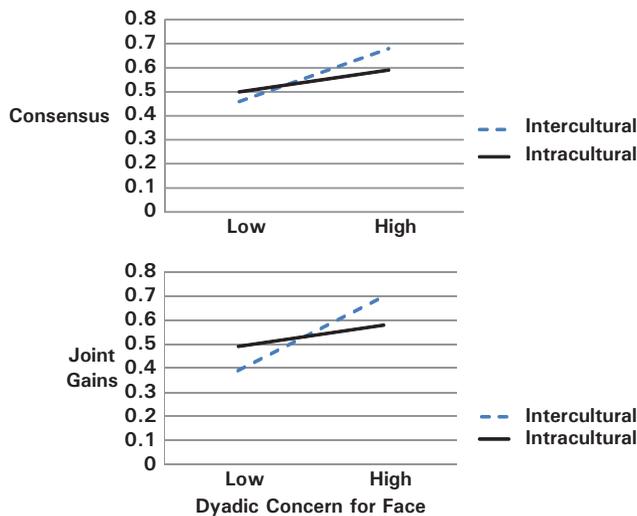
To test hypotheses 2d and 2e, we examined interactions between aggregated concern for face and cultural conditions (same-culture vs. intercultural). As table 3 reveals, the interaction term is significant for consensus ($\beta = .15$, $p < .01$), joint gain ($\beta = .16$, $p < .01$), and dyadic satisfaction ($\beta = .18$,

Figure 3. Interactions of need for closure (NFC) and cultural conditions in Study 1.*



* The graphs are plotted for "low" and "high" dyadic estimates of NFC. The y axis of joint gains shows the percentage of the maximum joint gains in the Cartoon negotiation, which is \$5.1 million.

Figure 4. Interactions of concern for face (CFF) and cultural conditions in Study 1.*



* The graphs are plotted for "low" and "high" dyadic estimates of CFF. The y axis of joint gains shows the percentage of the maximum joint gains in the Cartoon negotiation, which is \$5.1 million.

$p < .01$), showing that the positive effects of concern for face are stronger for intercultural negotiations, supporting hypotheses 2d and 2e. These interactions are illustrated in figure 4, revealing that concern for face is more predictive of

consensus and joint gains when negotiation is intercultural rather than within the same culture.

Study 1 showed support for our main hypotheses, namely, that although cross-cultural negotiations present challenges for consensus building, there are important conditions that moderate these effects. As hypothesized, need for closure exacerbated difficulties in consensus building, yet concern for face attenuated difficulties in consensus building, and this was more pronounced in intercultural negotiations. We conducted a second study to assess the generalizability of the patterns we found in Study 1. We sought to demonstrate that the effects and interactions theorized and found using the Cartoon simulation in Study 1 were not confined to one particular context and scenario. This is particularly important in cross-cultural research when there could be rival hypotheses accounting for the results, including differential reactions to the task, experimenters, and measures (Gelfand, Raver, and Ehrhart, 2002).

STUDY 2

Participants and Procedures

We used a modified version of the Alpha Beta Robotics negotiation (Gladwin, Weiss, and Zerkin, 2003) in the U.S. and China with graduate students who had similar profiles and negotiation experience as those in Study 1. Table 1, above, provides descriptive statistics on the sample. The simulation is a contract negotiation between company Alpha in the U.S. and company Beta in China over robotics used to produce batteries in electric cars. There are four issues to be negotiated: technology transfer and royalty are distributive issues; volume and models are integrative issues. We chose this simulation for three reasons. First, the roles in Alpha Beta incorporate cultural stereotypes, providing a priming approach that differs from the measurement approach to cultural values in the first study. The priming materials asked Chinese participants to behave and communicate in a collectivist, indirect, and high-context way; American participants were asked to behave and communicate with an individualistic, direct, and low-context approach. Second, similar to the Cartoon negotiation in Study 1, the multiple issues to be negotiated provide cognitive complexity and hence suitable opportunities to gauge variance in mental models. Third, there is a higher probability for impasse in this negotiation, allowing us to compare differences in mental models between those who reached agreement and those who did not. In the intercultural negotiation, we assigned Chinese graduate students with less than three years of experience in the U.S. (similar to the Chinese intercultural participants in Study 1) to the Beta role, and Americans who were born in the U.S. to the Alpha role.

Measures

We used the same measures for need for closure, concern for face, mental model change, consensus, and satisfaction as in Study 1. For mental models, we asked participants to draw an open-ended concept map, and we also used the paired judgment technique. Participants made paired judgments of 10 elements, four specific to the Alpha Beta simulation, and six general elements in informational, relational, and emotional categories that surfaced in the pilot study. For simulation-specific elements, we replaced the five elements in the Cartoon negotiation used

in Study 1 with the four issues negotiated in Alpha Beta: (1) *Technology transfer*, (2) *Royalty*, (3) *Volume*, and (4) *Models*. The six general elements were (5) *Win-win*, (6) *Competition*, (7) *Profit of my company*, (8) *Relationship with the other party*, (9) *My emotions*, and (10) *Other party's emotions*. All participants created an open-ended concept map and performed paired judgments both before and after the negotiation. The QAP correlations between concept map and paired judgment were .65 before the negotiation and .71 after the negotiation, providing reliability evidence for our measure of mental models in this context and scenario.² As in Study 1, we used estimates from paired judgments in hypothesis testing. About one third of the pairs did not reach agreement (7 out of 19 pairs in the American intracultural condition, 6 out of 18 pairs in the Chinese intracultural condition, and 7 out of 18 pairs in the intercultural condition). The negotiation outcome variable was whether or not the dyad reached agreement; we compared the mental models between those who reached an agreement and those who did not; agreement was treated as a dichotomous variable in analyses.

Results

Table 4 shows descriptive statistics and intercorrelations for variables in this study. At the individual level, the correlation between need for closure and individual mental model change was $-.42$ ($p < .01$). Because negotiators were in dyads, we computed the correlation between need for closure and individual mental model change separately for buyers ($-.45$, $p < .01$) and sellers ($-.39$, $p < .01$). These results support hypothesis 1a.³ The regression analysis reported in table 5 shows that controlling for pre-negotiation mental model similarity, aggregated dyadic need for closure has a negative effect on consensus ($\beta = -.15$, $p < .05$) and dyadic satisfaction ($\beta = -.16$, $p < .05$), supporting hypotheses 1b and 1c. We also find via logistic regression an effect of aggregated need for closure on the dichotomous agreement/impasse outcome (odds ratio = .63, Wald statistic = 2.69, $p < .05$). An odds ratio smaller than 1 indicates a negative effect, supporting hypothesis 1c.

Table 4 shows that at the individual level, the correlation between concern for face and individual mental model change is $.29$ ($p < .01$). Once again, we also computed the correlation between concern for face and individual mental model change separately for buyers ($.31$, $p < .01$) and sellers ($.27$, $p < .01$). These results support hypothesis 2a. Controlling for pre-negotiation mental model similarity, regression analyses in the bottom half of table 5 show that aggregated dyadic concern for face has a positive effect on consensus ($\beta = .16$, $p < .05$) and dyadic satisfaction ($\beta = .18$, $p < .05$), supporting hypotheses 2b and 2c. We also find via logistic regression an effect of aggregated concern for face on the dichotomous agreement/impasse outcome (odds ratio = 3.78, Wald statistic = 3.72, $p < .05$). An odds ratio larger than 1 indicates a positive effect, lending further support to hypothesis 2c.

² To calculate a QAP correlation between concept maps and paired judgments, concept maps are first converted into matrices with each element coded as 0 (no link drawn in the map between a pair of concepts) or 1 (link present). In paired judgment matrices, each element is the number between -4 and $+4$ provided by the participant for that concept pair.

³ We conducted the same two alternative analyses as in Study 1, and the results again produced patterns similar to those reported in the text.

Table 4. Overall Descriptive Statistics and Intercorrelations for Study 2 (N = 110)*

Variable	Mean	S.D.	1	2	3	4	5	6	7	8
1. Gender (Female)	47%									
2. Age	31.82	7.51	.05							
3. Education	3.36	.53	.03	.11						
4. Work experience	7.30	7.85	.03	.27**	-.09					
5. Need for closure	3.52	.76	-.02	.03	.11	.10	(.73)			
6. Concern for face	5.38	1.65	.05	-.05	.06	-.08	.07	(.76)		
7. Technology	12.22	4.35	.03	-.05	.03	.07	.05	.06		
8. Royalty	10.67	3.91	-.04	.02	-.04	.03	.09	.08	-.31**	
9. Models	15.70	6.29	.00	.04	.05	-.02	-.08	.06	-.32**	-.20*
10. Volume	16.53	6.82	.03	-.01	.03	.00	-.03	.11	.19*	.16*
11. Profit of my company	17.95	7.26	-.06	.05	-.03	.08	.18*	.16*	.41**	.27**
12. Competition	15.23	5.18	-.06	-.05	.03	-.06	.15*	-.12	.43**	.30**
13. Win-win	12.82	3.91	.05	.01	-.05	.03	.06	.18*	.25**	.29**
14. Relationship with other party	12.95	4.26	.06	-.03	.02	.01	-.07	.17*	.15*	.17*
15. My emotions	3.24	1.05	-.07	-.08	.05	.02	.07	.08	-.03	.03
16. Other party's emotions	3.07	1.02	-.06	-.08	.05	.05	-.05	.07	-.03	.02
17. Individual mental model change	.52	.27	.05	.08	.02	.04	-.42**	.29**	.15*	.16*
18. Satisfaction	3.97	1.38	.06	-.05	-.05	-.08	-.08	-.07	.16*	-.07

Variable	9	10	11	12	13	14	15	16	17	18
10. Volume	.13*									
11. Profit of my company	.13*	.18*								
12. Competition	.24**	.15*	.33**							
13. Win-win	.15*	.17*	-.17**	-.27**						
14. Relationship with other party	.15*	.14*	-.16*	-.22**	.35**					
15. My emotions	-.03	.03	-.05	-.05	.15*	.07				
16. Other party's emotions	-.03	-.02	-.03	-.03	.03	.05	.15*			
17. Individual mental model change	.17*	.16*	.15*	.15*	.21**	.16*	.16*	-.04		
18. Satisfaction	-.06	.15*	.15*	-.09	.15*	.16*	.16*	.08	.17*	(.72)

* $p < .05$; ** $p < .01$.

* Numbers on the diagonal, in parentheses, are Cronbach's alphas. Variables #7-10 are mean centrality scores obtained from UCINet for post-negotiation mental models.

Next, we examined interactions between dyadic need for closure and the cultural conditions to test hypotheses 1d and 1e. As table 5 shows, the negative effects of dyadic need for closure on consensus ($\beta = -.16, p < .05$) and on aggregated satisfaction ($\beta = -.12, p < .05$) are stronger for intercultural negotiations, supporting hypotheses 1d and 1e. In logistic regression, the negative effect of dyadic need for closure on reaching agreement is stronger for intercultural than for same-culture dyads (odds ratio = .06, $\Delta X^2 = 3.85$, Wald statistic = 3.92, $p < .05$), further supporting hypothesis 1e.

Last, we examined interactions between dyadic concern for face and the cultural conditions to test hypotheses 2d and 2e. Regressions in table 5 show that the positive effects of dyadic concern for face on consensus ($\beta = .13, p < .05$) and on aggregated satisfaction ($\beta = .15, p < .05$) are amplified for intercultural negotiations, supporting hypotheses 2d and 2e. In logistic regression, the positive effect of dyadic concern for face on reaching agreement is amplified

Table 5. Regression Analysis of the Interactive Effects of Need for Closure (NFC), Concern for Face (CFF), and Cultural Conditions in Study 2*

Variable	Consensus		Aggregated Satisfaction	
	H1b Step 1	H1d Step 2	H1c Step 1	H1e Step 2
Pre-negotiation similarity	.18*	.16*	.17*	.16*
Aggregated NFC	-.15*	-.11*	-.16*	-.13*
Cultural conditions		-.15*		-.12*
Agg. NFC x Cultural conditions		-.16*		-.12*
ΔR^2		.06*		.05*
Adjusted R^2	.09	.15	.10	.15
D.f.	2, 53	4, 51	2, 53	4, 51

Variable	H2b	H2d	H2c	H2e
	Step 1	Step 2	Step 1	Step 2
Pre-negotiation similarity	.18*	.16*	.17*	.16*
Aggregated CFF	.16*	.12*	.18*	.15*
Cultural conditions		-.15*		-.13*
Agg. CFF x Cultural conditions		.13*		.15*
ΔR^2		.05*		.03*
Adjusted R^2	.10	.15	.08	.11
D.f.	2, 53	4, 51	2, 53	4, 51

* $p < .05$.

* Cultural conditions were coded 0 = intracultural and 1 = intercultural.

for intercultural dyads (odds ratio = 2.11, $\Delta X^2 = 5.37$, Wald statistic = 5.02, $p < .05$), further supporting hypothesis 2e.

DISCUSSION

Our research investigated consensus building in intracultural and intercultural negotiations and found that individual motivations amplify or diminish cultural barriers to consensus building by enabling or limiting change in mental models in different partner combinations and cultural contexts. Among both American and Chinese negotiators, we found that a common psychological mechanism—the epistemic motivation of need for closure—hindered change in mental models, consensus building with the other party, and the achievement of higher joint outcomes. Another common psychological mechanism—the social motivation of concern for face—facilitated change in mental models, consensus building with the other party, and the achievement of higher joint gain. Given the greater divergence of negotiators' mental models in cross-cultural negotiations, compared with same-culture negotiations, the detrimental effect of need for closure on consensus in mental models and negotiation outcomes is more pronounced in cross-cultural negotiations. Similarly, compared with within-culture negotiations, the beneficial effect of concern for face is more pronounced in cross-cultural negotiations than same-culture negotiations. Put differently, the difference in mental models that occurs in cross-cultural negotiations is more easily overcome when the parties are higher in concern

for face but is amplified when the parties are higher in need for closure. Hence, we have shown that the effects of culture on negotiation are dynamic, not uniform or absolute. The effects of cultural differences depend on the adaptability of the individuals' mental models, which is driven by epistemic and social motives.

These findings inform theory on the impact of culture on negotiations and other aspects of work and organizations (Morris and Gelfand, 2004; Morris, 2011). One stream of research treats demographic variables as proxies for cultural orientation and culture's influence on negotiators' behavior as stable and static (e.g., Graham, Mintu-Winsatt, and Rodgers, 1994; Paik and Tung, 1999; Graham and Lam, 2003). Much of the cross-cultural research in the last few decades falls into this camp, providing insights into cultural variations in persuasion styles (Johnstone, 1989), perceptions of uncertainty (Gudykunst and Nishida, 1984), and holistic versus analytic thinking styles (Nisbett, 2003). In the field of conflict and negotiation, scholars have found cultural differences in judgment biases and constellations of strategies (e.g., Gelfand and Christakopoulou, 1999; Tinsley, 2001).

The influence of culture depends not just on an individual's nationality or the socialization process that went along with it, however, but also on his or her epistemic and social motives, which moderate how much that socialization will manifest in current behavior, particularly in intercultural interactions. Culture's influence is not uniform across its members or consistent in each individual across situations. An alternative approach, dynamic constructivism, treats culture as a series of situational cues that stimulate or constrain culturally conventional cognition and behaviors (Gelfand and Realo, 1999; Hong et al., 2000; Gelfand et al., 2001; Morris, Menon, and Ames, 2001; Fu et al., 2007; Savani et al., 2011). While previous studies have shown that need for closure moderates the effects of cultural norms on a single decision (e.g., Fu et al., 2007), our work advances the dynamic constructivist approach in two ways. First, our findings provide evidence that social motivation (concern for face) as well as epistemic motivation (need for closure) can alter the impact of cultural differences at the negotiation table. Second, we show that epistemic and social motives affect not just reactions in a given moment, but also the degree to which people are able to change their mental models over time and how those changes are driven by social interactions across the bargaining table. Thus we capture more fully the dynamic aspects of the dynamic constructivist theory of culture. To be sure, knowing mean differences between people from different cultures is important. Nonetheless, this dynamic constructivist approach highlights the insight that, in practice, the factor most important for effective cross-cultural negotiation is not necessarily how different the two sides are, but whether the people coming to the table are open to changes in perceptions of the situation.

This work has important practical implications. It suggests that successful cross-cultural negotiation can be fostered by the selection of people to negotiate who, despite fully understanding their home culture, are open to change. Those who have greater concern for face, and perhaps other social motivations that can now be studied, are more attentive to the other side and more willing to adjust their views. Those who are more concerned with confirming existing world-views are more likely to have inflexible mental models, yielding lower joint outcomes in integrative bargaining situations. Moving from trait-based need for closure and concern for face, there may also be ways to trigger these

motives. Triggers that enhance need for closure, such as time pressure (Fu et al., 2007), should be avoided, while triggers of concern for face or other prosocial motivations could be encouraged. Cultural intelligence is a prime factor that could affect consensus building through such epistemic and social motives. Imai and Gefand (2010), for example, found that cultural intelligence is related to lower need for closure and higher prosocial motivation and that cultural intelligence helped negotiators achieve integrative sequences and higher outcomes in intercultural negotiations. The current research suggests that cultural intelligence, through its effects on epistemic and social motivation, likely helps negotiators to build consensus as well.

Mental models, as holistic cognitive networks, manifest the dynamic interactions between individual motivations and cultural conditions. Change in mental models in intercultural conditions suggests cultural “adaptation”—psychological and behavioral adjustment that people make to fit into a new cultural environment—that helps people overcome cultural barriers in international encounters (Weiss, 1994; Adair, Okumura, and Brett, 2001). Evidence from studies of business meetings (Francis, 1991; Pornpitakpan, 1999) and leader-member interactions (Thomas and Ravlin, 1995) show that when people make adaptations in intercultural settings, they are more likely to build mutual attraction, liking, and trust. Research on cultural intelligence (Earley and Ang, 2003) proposes that individuals with an ability to adapt to other cultures will be more successful in international encounters. The advanced ability to adapt cross-culturally is associated not only with knowledge of other cultures, but with willingness to engage in new cultural circumstances and to proactively adapt one’s behaviors in negotiation (Imai and Gelfand, 2010; Friedman et al., 2012). Our finding that need for closure constrains but that concern for face encourages change in mental models carries both theoretical and practical implications for understanding critical triggers of intercultural adaptation.

Our studies also contribute to research on epistemic and social motives in negotiation. Extending De Dreu and colleagues’ (De Dreu, Koole, and Oldersma, 1999; De Dreu and Carnevale, 2003; De Dreu, 2004; De Dreu, Nijstad, and van Knippenberg, 2008) research, we show that need for closure is related to consensual validation processes in negotiation. In particular, we show that need for closure impedes consensus because parties are less apt to change mental models and are less able to achieve convergence in mental models through negotiation. Similarly, we extend previous research on social motives, which often focuses on prosocial motivation—the idea of wanting to help the other party as a factor that enhances joint outcomes and produces other benefits. We show that other aspects of social motives—such as concern for face, which focuses simply on caring how one is viewed by others—create an openness of mind, regardless of actual inclinations to help the other side.

We also introduce a novel methodology to the study of cross-cultural negotiations. A unique element of the research reported here is the use of network analysis, similar to the methods used by Van Boven and Thompson (2003) and Olekalns and Smith (2005), to map the structure of relationships between elements of negotiators’ mental models. This is among the first efforts to integrate cognition, motivation, and cultural processes into a comprehensive network approach in negotiation contexts.

Limitations and Future Research

Although we hypothesized and measured mental models both before and after negotiations, we cannot draw a causal conclusion about the relationship between consensus and negotiation outcomes, as the vision and expectation for an agreement may have influenced the construction of consensus. Drolet, Larrick, and Morris (1998) and Epley, Caruso, and Bazerman (2006) showed that under some conditions, taking the other side's perspectives hinders joint effectiveness in integrative negotiation. Future research could manipulate the consensus-building process while measuring mental models at more points in time during a negotiation process to tease out the causal relations between consensus building and negotiation outcomes.

One limitation to the approach we have taken is that, consistent with the dominant approach to mapping mental models, we identified and measured links between concepts but did not specifically theorize about whether the negotiator saw the direction of a relationship between concepts to be positive or negative. Because UCINet takes into consideration both the strength and the direction of ties when mapping negotiators' mental models, we believe such information has enhanced the predictive power of similarity in mental models. In the next iteration of research on mental models, it would help to specifically hypothesize and investigate how positive and negative ties influence the patterns of negotiators' mental models and negotiation outcomes. It is also possible that the patterns of results we found reflect the rather general nature of the mental models' elements. Future studies could study more specific and nuanced mental model elements and their consequences in negotiation.

Although we measured the content of mental models based on an extensive pilot study, we did not allow more idiosyncratic elements to surface in the main study. Even with constrained sets of elements in mental models, we were still able to find significant patterns of variance across motivations and cultural contexts in two scenarios. Given that, we regard our findings as a conservative test of the role of change in mental models. Future research may further investigate and categorize the highly individualized elements in mental models, in conjunction with the consensual types of elements in mental models.

Another limitation is our reliance on simulation studies. Although our lab-based bargaining tasks provide a rich context for examining same-culture and intercultural negotiations with complex issues, they have the limitation of being just two instances of negotiation interactions, and some mental model elements were unavoidably constrained specifically to fit the scenarios. Further research on negotiators' mental models could investigate mental models using additional scenarios with different structural features, such as situations in which power is asymmetrical. Studies are also needed that draw from field observations of practicing negotiators and that examine the cultural influences of mental models, exploring the emic and etic aspects of negotiators' cognition and behavior in cross-cultural settings.

We acknowledge that for the intercultural negotiations, Chinese negotiators may have been somewhat acculturated to the U.S. We also recognize that this sample does not represent the general population in terms of education level or international exposure (of Americans or Chinese), and this is a limitation. Nevertheless, we believe that our sample does resemble the training and specialty profile of many practitioners in real-world intercultural negotiations, who, after all, are self-selected to be active players of international exchange. We

are aware through personal experience in international negotiation training that many practitioners engaging in intercultural negotiations usually come to the encounter having had some sort of cultural training or experience. Given the highly competitive nature of a contemporary multicultural, internationally experienced workplace, it may be unusual to find someone with minimal cultural experience or knowledge placed in this kind of negotiation. Moreover, the idea that our Chinese participants may have been partly acculturated to the U.S. would only weaken our results—finding differences between cross-cultural and same-culture negotiations despite this methodological constraint should provide more, not less, confidence in our findings.

Lastly, in this research, as in much of the work in the area of international negotiation, we have assumed that one-on-one negotiation is the natural unit of negotiation analysis for both Chinese and American negotiators. This assumption may be culturally biased, and its use in studies of intercultural bargaining may prime participants toward a competitive mindset. Depending on the situation, however, group negotiations may also activate perceptions about ingroups (one's own negotiation team) and outgroups (the other negotiating sides), eliciting a competitive frame. To clarify these cultural assumptions, future research can use qualitative methods to survey individuals' beliefs and suppositions about which conditions compose a "typical" or "logical" negotiation unit (individuals versus groups) from participants in different cultural contexts.

Despite these limitations, we have provided evidence that mental models matter and that differences in mental models are especially impactful in cross-cultural negotiations. Moreover, cultural constraints that may limit the convergence of mental models in negotiations depend on negotiators' motivations. We have learned that these special challenges are influenced by characteristics of negotiators that reflect social and epistemic motivations. Those high in concern for face, a form of social motivation, are more likely to overcome the challenges of mental model convergence in cross-cultural settings, while those high in need for closure, a form of epistemic motivation, are likely to be less able than others to overcome cultural barriers in negotiation. An avenue for future exploration is the even more interesting situation in which intra-dyadic motives conflict, such as when a negotiator high in need for closure and one high in concern for face find themselves across the table from each other. We've just begun to explore such complexities.

Acknowledgments

We thank Frank Flynn, Kathleen McGinn, Ed Rigdon, and the anonymous reviewers for helpful comments, and Claudia Dale, Townsend Bailey, Yulan Han, Jason Stansbury, and Wei Cai for research assistance. Financial support for this research was provided to Leigh Anne Liu in the form of dissertation grants from Vanderbilt University and faculty summer research grants from Georgia State University's Robinson College of Business, in part by the U.S. Army Research Laboratory and the U.S. Army Research Office under grant number W911NF-08-1-0144 to Michele Gelfand, and in part by the National Natural Science Foundation of China under grant number 70872002 to Zhi-Xue Zhang.

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Authors' Biographies

Leigh Anne Liu is an associate professor of international business at Georgia State University's Robinson College of Business, Atlanta, GA 30302-3989 (e-mail: laliu@gsu.edu). Her research explores culture's dynamic influence on negotiation, conflict, relationship, identity, and paradox. She received her doctorate in organizational behavior from Vanderbilt University.

Ray Friedman is Brownlee O. Currey Professor of Management at Vanderbilt University's Owen Graduate School of Management, Nashville TN 37203 (e-mail: ray.friedman@vanderbilt.edu). His research looks at conflict, negotiation, diversity, culture, and Chinese management. He received his doctorate in sociology from the University of Chicago.

Bruce Barry is Brownlee O. Currey Jr. Professor of Management at Vanderbilt University's Owen Graduate School of Management, Nashville, TN 37203 (e-mail: bruce.barry@vanderbilt.edu). His research looks at ethical decision making, social influence, negotiation, freedom of expression at work, and corporate political behavior. He received his doctorate in organizational behavior from the University of North Carolina at Chapel Hill.

Michele J. Gelfand is Professor of Psychology and Distinguished University Scholar Teacher at the University of Maryland, College Park, MD 20742 (e-mail: mgelfand@umd.edu). Her research focuses on cross-cultural social and organizational behavior, conflict, negotiation, revenge, and forgiveness. She received her doctorate in psychology from the University of Illinois, Urbana Champaign.

Zhi-Xue Zhang is a professor of organization management at the Guanghai School of Management, Peking University, Beijing, China 100871 (e-mail: zxzhang@gsm.pku.edu.cn). His research examines team process, negotiation, conflict management, leadership behavior in the Chinese context, and cross-border management. He received his doctorate in social psychology from the University of Hong Kong.