Metacognitive Strategies for Making Sense of Cross-Cultural Encounters

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Abstract

As cross-cultural interactions become more commonplace and of shorter durations, understanding the abilities that enable some sojourners to function competently in unfamiliar cultural contexts is increasingly important. The present investigation took a cognitive science approach to the problem of cross-cultural competence, examining metacognitive strategies for dealing with puzzling interactions. A think-aloud study of cross-cultural expertise was conducted using two scenarios based on real incidents set in two different cultures. Each scenario contained surprising cultural behaviors. Three groups of participants (*n* = 60) with varying levels of expertise were compared. The results indicated several differences in the metacognitive strategies used to make sense of cultural anomalies. Overall, the types of reasoning cross-cultural experts engage in to make sense of cultural surprises were found to share characteristics with the reasoning processes exhibited by expert scientists. The findings of the current study have several implications for training specific aspects of cross-cultural competence.

Keywords

cultural psychology, learning/cognition, education/teaching, metacognition, cross-cultural competence

An important challenge for professional sojourners is that they tend to be assigned to a variety of areas in the world throughout their careers and are only in specific locations for relatively short periods of time. Understanding the abilities and other factors that enable some sojourners to function competently when they find themselves immersed in unfamiliar cultural contexts is becoming an increasingly important area of research, and one being addressed from several perspectives (Ang & Van Dyne, 2008; Gelfand, Erez, & Aycan, 2007; Ward, 2004). There are likely a number of characteristics that distinguish such cross-culturally competent individuals from those who find themselves at a loss in culturally diverse situations. We suggest that one set of contributors lies in the metacognitive strategies involved in making sense of culturally different others.

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In the following, we define cultural sensemaking, argue for its importance in cross-cultural interactions, and then provide an overview of the cognitive processes involved in dealing with puzzling encounters. We then discuss a set of metacognitive strategies that we hypothesize to discriminate between more and less competent cultural sensemaking performance. Finally, we describe a think-aloud study that compares cross-cultural experts and novices on the hypothesized strategies.

Cultural sensemaking refers to the cognitive processes by which people come to understand and explain the behavior of others with distinct cultural backgrounds (Osland & Bird, 2000; Sieck, Grome, Smith, & Rababy, 2010). Researchers have theorized for some time that the ability to explain human behavior in a culture is an important aspect of what it means to be competent in that culture, and the notion has been expressed using various terms, such as making "isomorphic attributions"[1] and improving "mental models" of a culture (Ang et al., 2007; Brislin, Cushner, Cherrie, & Yong, 1986).

The essence of the theory is that participants in a culture draw on widely shared ideas that comprise a common symbolic meaning system to make sense of events (Atran, Medin, & Ross, 2005; Rohner, 1984; Sieck, 2010). In particular, members of a culture tend to generate relatively similar causal explanations, or mental models about the workings of a large variety of physical, biological, and social entities, including models of how other members of that culture will think and behave in specified situations. Individuals' perceptions of the widely shared ideas held by the group have been studied under the rubric of intersubjective consensus (Wan, Chiu, Peng, & Tam, 2007). Such shared mental models form the basis of expectations, judgments, decisions, and actions (Gentner & Stevens, 1983) that enable smoothly coordinated routine functioning among members of the cultural group. This latter effect can be understood as a parallel to the benefits of shared mental models in team situations (Mathieu, Goodwin, Heffner, Salas, & Cannon-Bowers, 2000). From this perspective, a difficulty for outsiders is that they initially lack the culturally relevant mental models typically used to understand others within the culture (Sieck et al., 2010). According to the theory, learning to develop explanations of behavior that fit within the cultural meaning systems shared across the population, enables a sojourner to understand, predict, and solve problems within that cultural system (Osland & Bird, 2000).

In line with this theoretical view, there have been some empirical results indicating that enhanced interactions stem from better explanations. For example, training via cultural assimilators improves explanations by teaching learners to select culturally plausible underlying motivations for a variety of behaviors (Fiedler, Mitchell, & Triandis, 1971; Triandis, 1975). In a typical cultural assimilator task, learners engage in a series of trials, each of which includes description of a surprising behavior and several response options that represent culturally plausible motivations for the behavior. After reading a short description of the behavior on a given trial, participants choose among the listed explanations for that behavior. Feedback is then given that provides the cultural rationale for the behavior. Over a set of trials, learners would tend to acquire culturally appropriate explanations of the behavior. Assimilator training has been tested in numerous studies, and generally found to be effective relative to controls in transfer tasks involving actual interactions, such as engaging in a mock negotiation with a member of the host culture and similar controlled interpersonal interactions (Fiedler et al., 1971). That is, learning cultural explanations of behaviors appeared to result in improvement in handling actual intercultural interactions (see Bhawuk & Brislin, 2000, for a review).

The metacognitive processes and strategies involved in improving explanations of cultural behavior form an important, if not crucial, aspect of cultural sensemaking. In fact, one might argue that the ability to learn and reason through ambiguous situations is what fundamentally distinguishes skilled cultural sensemaking from culture-specific competence. Several researchers allude to the importance of learning about unfamiliar cultures, but emphasize learning how to behave rather than how to explain behavior. For example, Kim (1991) defined cultural adaptability as, "the individual's capacity to suspend or modify some of the old cultural ways, to learn

and accommodate some of the new cultural ways" (p. 268). In this and other cases, cultural learning emphasizes learning the social skills needed to behave in social interactions according to relevant cultural norms (Ward, 2004). Learning how to behave within a culture is important for seamless, routine functioning in that milieu, yet a sojourner can mimic behaviors without understanding the intentions of others or being able to gain deeper understanding of the culture as a result of surprises. Likewise, a sojourner may be able to effectively "read" intercultural situations without being able to act effectively. The present research focuses on understanding the ability to read and make sense of intercultural situations.

Research into cultural intelligence (CQ) has also indicated the importance of cultural learning, using the label "metacognitive CQ" to refer to the processes individuals use to acquire and understand cultural knowledge (Ang et al., 2007). As the metacognitive CQ construct has evolved, increasing emphasis has been placed on learning with respect to cultural explanations of behavior, as is most relevant to cultural sensemaking (Ng, van Dyne, & Ang, 2009). Earlier formulations of metacognitive CQ treated metacognition as a unidimensional construct, though subsequent research further partitioned the construct into three metacognitive processes: planning, awareness, and checking (Van Dyne et al., 2012). Of these, checking interpretations and assumptions is perhaps most closely aligned with existing work on cultural sensemaking.

We next sketch the general learning processes relevant to cultural sensemaking, followed by a more detailed description of metacognitive processes and strategies that we hypothesize are associated with skilled cultural sensemaking performance.

A few intercultural researchers have provided overview descriptions of learning processes that are central to cultural sensemaking (Bhawuk, Sakuda, & Munusamy, 2008; Osland & Bird, 2000; Taylor, 1994). These models tend to be quite similar, and follow a prototypical process description that is closely associated with concepts of discovery learning or inquiry-based learning that can be traced to Bruner, Piaget, and others, and that continues as a central area of research in the psychology of scientific reasoning (Wiley et al., 2009). The canonical process typically begins with a dilemma, anomaly, or puzzle that requires explanation (Alberdi, Sleeman, & Korpi, 2000; Sandoval & Reiser, 2004). For example, in a study of scientific expertise in coping with surprises, Alberdi and colleagues presented five professional botanists with unusual plant specimens and asked them to think-aloud as they attempted formal classification. In the context of intercultural interactions, a sojourner experiences surprise when host nationals behave contrary to the sojourner's (ill-informed) expectations (Archer, 1986; Hugh-Weiner, 1986). We refer to such instances as, "cultural surprises," as the behaviors of interest are within norms for the culture, yet may appear anomalous to people outside the culture. The unexpected observations may occur as a result of sojourners having only mental models of behavior from their home culture to draw on, or because their current knowledge state includes inadequate models of behavior in the host culture. For example, with respect to the latter possibility, Osland and Bird (2000) discussed how sojourners may engage in "sophisticated stereotyping" when they overgeneralize explanations based on cultural dimensions to contexts in which they do not apply.

Regardless of the determinant of the cultural surprise, in response, sojourners may engage in focused cultural sensemaking that ultimately leads to changes in their own conceptions of the behavior. The change process is not trivial, and sojourners may often respond in one of several alternative ways for coping with the anomalous behavior that do not result in deep conceptual change. These include disregarding the surprising observations in favor of data that confirm their expectations, reinterpreting the conflicting data so that they better fit with existing mental models, and making minor refinements to the models so they can more readily account for the observations (Alberdi et al., 2000; Chinn & Brewer, 1993). Consideration of these general learning processes that are central to cultural sensemaking, as well as the associated difficulties in achieving significant conceptual change prompts the question of what factors determine how sojourners will respond to cultural surprises.

An individual's response to a cultural surprise is likely influenced by the convergence of several kinds of factors, including environmental and situational determinants. One important set of factors of interest are the metacognitive strategies that a sojourner uses in response to an unexpected behavior (Ang et al., 2007; Van Dyne et al., 2012). Metacognition refers to knowledge about ones' own thinking and learning (Flavell, 1979; Kuhn, 2000), and generally subsumes a variety of self-regulatory processes and strategies for coordinating and controlling deliberate attempts to explain phenomena and solve problems (Gourgey, 2001). The literature on scientific reasoning offers some clues about the metacognitive strategies that may enable a person to cope effectively with cultural surprises (Alberdi et al., 2000; Kulkarni & Simon, 1988; Mynatt, Doherty, & Tweney, 1978; Sandoval & Reiser, 2004; Schunn & Anderson, 1999). The strategies that we examine here mirror what is typically considered to be effective scientific thinking, and we derived them from a review of existing research in scientific reasoning strategies and closely related areas of metacognition, along with consideration of research related to coping with puzzling cross-cultural encounters, viewed through the same lens. This focus is in line with Osland and Bird's (2000) suggestion to, "approach learning about another culture like a scientist who holds conscious stereotypes and hypotheses in order to test them" (p. 75). Review of this diverse literature yielded an initial set of distinct metacognitive strategies for responding to cultural surprises. Specifically, we propose five metacognitive processes and strategies a sojourner may selectively use, and that we associate with competent cultural sensemaking of the kind necessary for developing elaborate, nuanced explanations of cultural behavior. These include notice the anomaly, instantiate a general cultural schema, inquire as to causes, consider alternative explanations, and suspend judgment. Although conceptually distinct, we do not suggest that the strategies are completely independent. We discuss each of these hypothesized strategies in turn.

Notice the Anomaly

This process involves monitoring one's ongoing activity and personal reactions in interpersonal interactions sufficiently to register the occurrence of behavior that is inconsistent with one's current mental models of how people from the culture typically behave. Anomaly detection has been investigated in metacognition research directed at comprehension processes (Sanford & Graesser, 2006). A key idea is that the feeling of accurately comprehending a story or other discourse is based on an overall assessment of coherence of the mental model generated from the source information. Coherence is established to the extent that contradictions do not exist within the model. However, coherence assessment tends to be incomplete, following a satisficing-type principle. When a sufficient level of coherence is established from one aspect of the model, a check on coherence based on other sources may not take place (Barton & Sanford, 1993). These processing considerations imply that noticing anomalies is not guaranteed, and that more thorough assessment of observations against current models may increase the likelihood of noticing anomalies and engaging in cultural sensemaking to resolve them. To our knowledge, research on anomaly detection has not been conducted in the context of intercultural encounters.

Instantiate a General Culture Schema

Assuming that a surprising behavior is detected, the sojourner might consider that the violated expectation may be the result of cultural differences in general (Archer, 1986; Bhawuk et al., 2008). Within research on scientific thinking, this kind of strategy has been referred to as "instantiate" (Alberdi et al., 2000). Instantiate is considered most relevant in the face of a puzzling phenomenon that challenges prior hypotheses. In such a case, the individuals activate a schema from their theoretical knowledge base to shift focus and narrow the hypothesis space. The instantiated schema tends to be a generic, high-level aspect of the case that suggests directions to be

explored. In cross-cultural social situations, the strategy translates to the instantiation of a general schema with culture as the central feature that offers a potential high-level explanation of a surprising behavior. Instantiating a general culture schema, in this way, serves to direct further exploration in the direction of cultural explanations that can engender deeper understanding of the culture. The strategy does not imply that it would make sense for sojourners to rely solely on cultural factors to explain behavior, to the exclusion of situational and personal factors. Instead, the idea is that sojourners who consider that encountered anomalous behaviors might stem in part from cultural differences will then focus on uncovering more details about the host culture.

Inquire as to Causes

Science and education researchers have found that people who directly inquire into the cause of unexpected events, such as by asking "why" questions, tend to achieve new insights that improve their explanations (Dunbar, 1993; Graesser, Baggett, & Williams, 1996). For example, in a study involving simulated scientific discoveries, Dunbar (1993) asked 20 participants to attempt to discover how genes control other genes while thinking aloud. Participants were given an initial hypothesis to test that was incorrect, and were able to conduct experiments that provided evidence inconsistent with their original hypothesis. At this point, participants dealt with the inconsistent evidence in one of two ways. One group continued with new experiments to find evidence to support the original hypothesis. None of these participants ever discovered the actual mechanism governing gene regulation. Others instead set the hypothesis aside and attempted to explain the cause of the inconsistent findings. These participants tended to generate the correct hypothesis. These, and other findings, led Dunbar to conclude that people make discoveries when, in the face of inconsistent evidence, they change their goals to determine the cause of the unexpected observations. Although, to our knowledge, this strategy has not been studied in intercultural research, it would seem readily applicable to cultural sensemaking situations.

Consider Alternative Explanations

When a person generates an explanation in support of a hypothesis, the mere act of explaining can lead to overconfidence in the truth of that hypothesis. One model of this phenomenon suggests that explaining or imagining draws attention to the focal hypothesis, and specifically encourages the temporary assumption that the hypothesis is true. Holding the hypothesis to be true implies that existing evidence must fit, and so promotes interpretation of the evidence in a manner that favors the hypothesis (Koehler, 1991). One way to avoid fixation on a particular explanation and overconfidence in its truth is to deliberately entertain alternative possibilities (Sieck, Merkle, & Van Zandt, 2007). For example, in a set of experiments on fixation and overconfidence, Sieck et al. (2007) had participants consider distinct alternatives independently. In one condition, for instance, subjects were instructed to successively assume each alternative was true and explicitly generate an explanation for why the alternative was true. This and other similar procedures designed to encourage consideration of alternative explanations reduced and even eliminated overconfidence. In the context of cultural sensemaking, this can be accomplished by either generating alternative explanations of a cultural surprise, or questioning evidence that appears to favor an obvious (e.g., stereotyped) answer to the surprise.

Suspend Judgment

An attitude that is central to scientific thinking is the willingness to suspend judgment when there is insufficient evidence (Gauld, 1982). In cross-cultural encounters, too, the sojourner may quickly, even automatically, generate an explanation of a surprising cultural behavior. If this

initial explanation is immediately adopted without further reflection and consideration, there is little chance of real additional learning about the culture. As in the science context, sojourners may instead have an open-minded attitude, and be willing to suspend their judgment (Triandis, 2006). By explicitly treating the explanation as a hypothesis that requires further testing, the sojourner implicitly sets an objective to obtain additional information about the culture and behavior.

In summary, we contend that cultural sensemaking competence can be understood at least in part by the adoption of metacognitive processes and strategies that facilitate the improvement of explanations of cultural behavior in the face of surprises.

The strategies described above have been examined previously in the wider literature on metacognition, primarily in the area of scientific reasoning skills. Some of the strategies have also been mentioned previously in the cross-cultural psychology literature. However, to our knowledge, little empirical evidence has yet been garnered for these strategies as related to skilled cultural sensemaking or other aspects of cross-cultural competence. The evidence that has been accumulated about metacognition and cross-cultural competence, more generally, has been somewhat indirect, relying primarily on self-report survey methods. Ward and Fischer (2008) made the case as follows, in reference to CQ:

> The self-report survey method in current use has obvious limitations. It shares the same weaknesses of other self-report instruments (e.g., response biases) and has particular limitations with respect to the measurement of intelligence. More specially, the CQ measure asks respondents to describe aspects of CQ rather than demonstrate it objectively. This is problematic. A more valid test of intelligence would not ask respondents if they have the knowledge or ability to solve a problem, it would require respondents to engage in problem solving! The development of alternative measurement techniques should be considered in future research. (p. 169)

Although Ward and Fischer refer to CQ, their comment applies equally whether one thinks in terms of cultural sensemaking, cultural learning, or cross-cultural competence in general.

In the present study, we conducted an exploratory investigation of the cognitive processing following a cultural surprise using a "think-aloud" method. Think-aloud techniques have been commonly adopted in cognitive science, and have proven effective in investigations of processes and strategies involved in learning, inquiry, problem solving, scientific reasoning, and other topics associated with high-level cognition (Ericsson & Simon, 1993), including cultural differences in such processes (Yates et al., 2010). In particular, we had cross-cultural experts and novices think out loud while reasoning through actual intercultural problems, and then looked for indications of differences related to the above five strategies in their cultural sensemaking processes. Indications of the strategies found more frequently in the verbal reports of cross-cultural experts than novices provides evidence that the strategy is important to cultural sensemaking competence. Note that the think-aloud procedure provides a high-standard of evidence in support of a strategy, as it requires that study participants spontaneously generate and apply the strategy in the context of the intercultural problem.

Method

Participants

Sixty participants comprising three groups completed the study. The first two groups included Army personnel recruited from the Washington, D.C., area, and who were associated with a field of specialization that requires substantial degrees of intercultural interaction and cross-cultural competence. Specific job-related tasks include building relationships with host-nation leaders at various levels, attempting to decrease tensions and improve relations between different cultural

groups in a locale (e.g., by organizing sports events and other gatherings), providing various forms of humanitarian assistance, and other activities associated with "hearts and minds." Of the Army personnel, 17 ("experts") had considerable field experience and training in the cross-cultural specialty area. These were individuals who were motivated to pursue a culture-oriented career path, who had been selected as suitable, and who had been successful in their jobs. Twenty-three ("novices") were in their last day of an introductory "breadth" training course in the specialty. These personnel did not have direct experience in jobs requiring cross-cultural interactions, though did have overseas experience in other areas of the Army (e.g., artillery) that required little cross-cultural interaction. The novice group thus served as a roughly age- and experience-matched control. The final group ("laypeople") consisted of 20 people who were recruited from the general populace in western Ohio, and who had little-to-no particular cross-cultural experience. We included this group to help identify any effects due to the training and general military knowledge of the novice group.

The experts averaged 36.8 years of age, averaged 14.7 years of Army service, and had resided (defined as at least 2 months stay) in an average of 3.4 places outside the United States. The novices were 35.6 years of age on average, served 12.8 years on average in the Army, and had resided in an average of 2.6 places outside the United States. The laypeople were 21.5 years of age on average, had no military service, and had resided in an average of 0.2 places outside the United States. The expert and novice groups had completed an average of 4 years of college-level education, and the laypeople had 3.5 years on average.

Materials

The materials included two scenarios derived from real critical incidents (cf. Flanagan, 1954). The incidents were described by experienced personnel about surprises they encountered during intercultural interactions. Several features were important for incident selection. First, although the Americans involved in the initial incidents were highly experienced, they were nevertheless surprised by the behaviors encountered, did not immediately know what was going on, and so engaged in cultural sensemaking processes. This was important for inclusion of the incidents within the current study, as it implied that solutions to the scenarios would not be obvious, even to experts. This setup was similar to Alberdi's method for investigating expert science strategies in the face of unusual specimens in plant taxonomy (Alberdi et al., 2000). This feature of the scenarios enabled the investigation of expert-novice differences in metacognitive processes for making sense of the cultural surprises. If the solutions were obvious to the experts, allowing for mere retrieval of the correct attribution, then it would be unnecessary to exercise metacognitive strategies. Second, we selected incidents with features expected to invite inquiry and hypothesis testing, respectively, because of our interest in investigating metacognitive strategies that are related to scientific reasoning processes. Host national behavior that had puzzled the original Americans involved was a central aspect of each of the scenarios. The first scenario suggested nothing about what might be the source of the surprise, and so invited initial questioning into causes of the unexpected behavior ("Inquiry Scenario"). In contrast, the emphasis in the second was on the evaluation of evidence related to hypotheses that were explicitly presented within the scenario ("Hypothesis Testing Scenario").

Inquiry Scenario. The "inquiry" materials consisted of a written description of a scenario describing a real situation that had occurred in Kosovo. Participants were instructed that they were recently put in charge of a Serbian bus situation. The scenario included information that the Serbs are a protected minority in Kosovo, live in enclaves, and are afraid to venture forth from these enclaves. The United States had been escorting a bus of Serbian college students out of their enclave to a nearby college. The United States decided to make a change in the security provided,

Table 1. Evidence Implying That the Afghan Governor Was Either Anti-U.S. (Negative) or Pro-U.S. (Positive).

Positive evidence	Negative evidence
Governor . . .	Governor . . .
Has been actively supporting the current government, not the Taliban	Was seen associating with U.S. adversaries on more than one occasion
Does not have a military background	Left town for 2 to 3 weeks
Was not a Mujahideen during the Soviet occupation	Apparently gave a roundabout answer
Has no record of participating in building militias or in drug trafficking	
Has not had any known allegiances with U.S. adversaries in the past 10 years	
Is secure and subsistence is not an issue for him	

from an armored escort vehicle to aerial surveillance and a guard on the bus. They demonstrated the aerial surveillance to the students, who seemed impressed. However, when the change was implemented, nearly all of the students quit riding the bus, the local leaders complained, and the bus drivers threatened a strike.

Participants did not learn the actual resolution to the original incident. However, the original incident reported to the researchers included the fact that further investigation of the scene led to the conclusion that the mothers of the students were not letting their college-age children ride the bus. This was surprising to the American personnel, as they expected college-age adults to make their own decisions about transportation to school. Once the situation was understood, the demonstrations of new security were repeated for the mothers, and they permitted bus riding again.

Hypothesis Testing Scenario. The "hypothesis testing" materials consisted of a written description of a scenario describing a situation involving a governor of an Afghan province. The information included that the governor had been actively supporting the official government for some time (rather than the Taliban). However, the governor was recently reported seen associating with U.S. adversaries and engaging in other "suspicious" behavior, prompting the focal hypothesis that the governor was actually anti-U.S. Other evidence about his loyalties was provided (summarized in Table 1). The U.S. personnel involved were shocked, and many were convinced that he was actually sided with the Taliban. After following activities for a while, they sent an officer to confront the governor about his association with the adversary, to which he gave a roundabout answer that further affected U.S. trust in his intentions.

Again, there was a resolution to this scenario that was not shared with the participants. In this case, further investigation led to the conclusion by personnel on the scene that the governor was, in fact, loyal to the Afghan central government. He was not anti-U.S., or anti-Afghan central government but rather was obligated in his position (by Afghan standards) to meet with all stakeholders in his region, whether considered friends or enemies of the nation. Not doing so would have harmed his authority within his domain.

Procedure

Participants took part in the study individually in a quiet room, accompanied by an experimenter. The researchers explained that they were interested in how people of varying levels of expertise developed an understanding of situations. The cultural nature of the situations was not mentioned, so as to prevent biasing participants to think in those terms. Rather, participants' mentions of culture as a component of the problems were measured. Participants were then told that they

would be given a couple of scenarios, one at a time, and for each, that they would be asked to read the scenario out loud, describe their understanding of the situation, anything they would want to know more about, and what actions they would take. Note that this was a "one-shot" procedure, as no further information or details about the situation were shared with study participants that would enable them to derive final solutions. The participants were also given standard "think-aloud" instructions (Ericsson & Simon, 1993), including that they should say everything that was on their minds, and that if more than 10 s elapsed, the experimenter would prompt with a request to keep speaking. The problem scenario and response instructions were intentionally kept vague to minimize imposed constraints, and to allow differences in the way participants structured the problems. The instructions were general enough to permit a wide range of responses, and participants did not appear to have any trouble responding. There was a researcher in the room during each session, per standard think-aloud procedures, so we would have spotted any cases in which a person really did not know what to do. We did not experience any occurrence of that kind. Everyone appeared to be fully engaged in the task, probably because the scenarios were interesting and the procedure itself is engaging. Participants' verbalizations were audio-recorded. The participants indicated when they felt they had provided sufficient response to the scenario. We did not time the responses, but all sessions were completed within an hour.

Results

The participants' think-aloud explanations of their understanding and questioning were transcribed and coded for analysis. Chi-square tests were used to determine the statistical significance of differential frequencies of code use, and odds ratios (ORs) were computed as measures of effect size. An OR of 1 reflects that there is no relationship between the variables. The farther the OR is from 1, the stronger is the relationship between variables, with ORs greater than 3 indicating strong relationships for positively associated variables (Haddock, Rindskopf, & Shadish, 1998). As can be seen in the descriptive statistics presented below, novices and laypeople typically responded similarly as compared with experts, and so are combined for computing inferential statistics except where noted. Metacognitive strategies that are appropriate and relevant to a situation depend on the specific nature of the task (Schunn & Anderson, 1999). As described above, the first scenario ("Inquiry") left the cause of the unexpected behavior wide open, whereas the second ("Hypothesis Testing") scenario indicated an obvious focal hypothesis (i.e., that the governor actually supported U.S. adversaries, rather than the United States). Hence, the strategies of noticing the anomaly and inquiry as to causes were the emphasis of the first "Inquiry" scenario, whereas consideration of alternative hypotheses and suspending of judgment were emphasized in the second scenario on "Hypothesis Testing." Instantiate a general culture schema was investigated for both scenarios. Scenario-specific coding categories were created based on the high-level strategies described in the introduction. For each scenario, we developed coding categories that instantiate the relevant metacognitive strategies within the specific context of the respective scenario. This enabled the use of concrete scenario elements to guide the coding process, and thereby promote reliability among coders. The scenario-specific codes are thus described as part of the results for each scenario, along with the decontextualized strategies they indicate. The coding process was conducted by two raters who were naive as to the study hypotheses, but who were trained to apply the concrete coding scheme to protocols. The raters first coded participant responses independently and then determined the final codes through consensus. Percentage agreement was computed for the independent codes to measure interrater reliability.

Inquiry Scenario

Coding. The coding dimensions for the Inquiry scenario were (rater agreement given for each code in parentheses) as follows:

Notice the anomaly.

- *Detect drop*: Did the individual indicate detecting that the drop in ridership was the central problem in the scenario and so notice the anomaly (81%).

Instantiate a general culture schema.

- *Culture*: The participant states that their understanding of the situation is based at least in part on cultural considerations (90%).

Inquire as to causes.

- *"Why stop riding?" Question*: With respect to inquiry, did the individual explicitly want to try to find out or just ask why the students had stopped riding the bus (92%).
- *"Who decides?" Question*: Did the individual explicitly inquire as to whether riding the bus was the student's decision? That is, did the participant want to determine whether someone else was influencing the students to stop riding the bus? (92%). This code was also about inquiry, more scenario-focused than the first.

Other/novice strategy.

- *Increase security*: Did the participant propose that the security forces should be increased? This could be a suggestion of a reinstatement of the original precautions, or a general suggestion to find some way to get security up (83%). This code represented implementing corrective procedures, as an alternative to engaging in cultural sensemaking.

Findings. Most participants recognized the drop in ridership as the primary problem in the scenario (73%), and that figure did not depend on expertise. The importance of taking cultural considerations into account to understand the scenario did increase substantially with expertise. Culture was never mentioned by the laypeople, and was explicitly mentioned as a potential factor by 13% of the novices, and 35% of the experts, $\chi^2(1) = 7.66$, $p = .01$, OR = 7.25. That is, the odds of considering culture were more than 7 times greater for the experts as compared with the nonexperts. The key kinds of inquiries that participants made also varied by expertise. Recall that the key inquiries were those that would lead directly to developing an accurate understanding of the scenario. Asking the "Why stop riding?" question was much greater for the experts (29%) than for the novices (4%) and laypeople (10%), $\chi^2(1) = 5.31$, $p = .02$, OR = 5.56. Likewise, experts asked the "Who decides?" question 47% of the time, whereas the question was only raised by 13% of novices and 5% of the laypeople, $\chi^2(1) = 10.86$, $p = .001$, OR = 5.56. Overall, the odds of the cross-cultural experts asking one of these critical questions was more than 5 times greater than the odds of nonexperts asking these questions. These are large effects. While the experts focused on gathering critical information that would help them understand the situation, the inexperienced participants suggested taking different actions aimed at increasing the ridership. In particular, suggestions to try increasing the security in some way, without understanding the situation, were far more prevalent among laypeople (55%) and novices (30%), as compared with the experts (12%), $\chi^2(1) = 4.97$, $p = .026$, OR = 5.41. This result runs parallel to findings in scientific expertise, in which experts tend to follow a more controlled process of attempting to structure and conceptualize problems, before moving on to specific design choices than do novices (Schraagen, 1993).

Correlations computed between the metacognitive codes revealed a positive relationship between the two inquiry codes ($r = .42$, $p < .001$). Also, instantiating culture was related to asking

the "Who decides?" question ($r = .38$, $p = .002$), but not the "Why" question. No other correlations among strategies were significant. The following examples from the transcripts illustrate key differences in processing. First, from participants focused on inquiry:

> So I would try to find ways to first determine what is the root of their not riding, why are they not riding the bus anymore?

> But, once again, it goes back to once you've dropped your escorts why is there a decrease in the ridership? Why did the ridership drop so drastically?

> One of the first things, based on the assessment, once the escorts started dropping, was anybody influencing the students not to ride the bus? Were the hardliners saying, 'you're not safe, don't get on it.' You'd have to talk to the students about that and find out if anybody was influencing them not to ride it.

Here are examples of different processing that emphasized corrective procedures:

> I would probably increase the security again, for the time being. Even though it is expensive the number of students who went to school dropped dramatically and so I would just give them the two vehicles back.

> They're wanting to provide security for these students and the less security, the fewer students who actually ride. And I think they're going to have a find a different method for these kids to get to school and make them feel safe.

Hypothesis Testing Scenario

Coding. The coding dimensions for the Hypothesis Testing Scenario were (rater agreement given for each code in parentheses):

Instantiate general culture schema.

- *Culture*: The participant states that their understanding is based, at least in part, on cultural considerations (90%)

Consider alternative explanations.

- The idea that the governor is anti-U.S is the focal hypothesis in the scenario. To measure the extent to which participants avoided fixation on that hypothesis and considered alternative explanations, they were assigned one point for explicit mention of the hypothesis that the governor is pro-U.S. (77%), and a point for questioning the evidence suggesting that the governor is anti-U.S. (90%).

Suspend judgment.

- The participant explicitly states that judgment of the governor should be suspended until further evidence can be garnered (56%).

Findings. As in the first scenario, taking culture into account as a way to focus further thinking increased considerably with experience level, $\chi^2(1) = 9.88$, $p = .002$, OR = 6.94. Specifically, culture was noted by 53% of the expert group, 22% of the novice group, and only 5% of the laypeople. The cross-cultural experts also scored significantly higher on the measure for

considering the alternative that the governor was not anti-U.S. ($M = 1.29$) than novices ($M = 0.83$) and laypeople ($M = 0.95$), $t(58) = 2.23$, $p = .030$, $d = .65$. Finally, participants in the expert group (59%) and novice group (57%) were more likely to explicitly mention that they should suspend judgment and obtain more data than were the laypeople (30%), $\chi^2(1) = 4.04$, $p = .044$, OR = 3.15. Correlations between metacognitive measures were computed, and none were statistically significant.

Again, we provide some examples to illustrate the strategies. The first is an example of considering alternative hypotheses:

> There are obviously a spectrum of possibilities here. It could be that the governor is expecting the U.S. to leave at some point in the future, possibly in the near future and he's hedging his bets by building his relationships with the [adversary]. It could be that he is genuinely working with the U.S. and just taking a different approach that's working in our favor. Or, it could be some possibly something in between those two scenarios, or maybe something else entirely.

And here are a couple of excerpts in which participants explicitly note the importance of suspending judgment on the matter:

> I'd certainly want to find out what it is and not simply make a lot of assumptions and go rushing in . . . And I would try to approach this with an open mind.

> But, I don't know that there's enough evidence there to support the fact that that's counter to our mission.

Discussion

Cultural researchers sometimes describe cross-cultural interactions as involving the same kinds of thinking styles routinely used by expert scientists (Osland & Bird, 2000). The present study specifically set out to test this claim by using "think-aloud" methods often used to investigate scientific reasoning, inquiry and other topics in high-level cognition. In particular, cross-cultural interactions can result in confusion or conflict when the actions of a person from another culture are inconsistent with expectations about how people from that culture are likely to behave. The current study investigated differences in the strategies that cross-cultural experts and novices use to make sense of cultural surprises, and build their understanding of other cultures. The results indicated several differences between the strategies used by experts and nonexperts to make sense of cultural anomalies. In the first, "inquiry"-oriented vignette, experts tended to ask questions that would explicitly challenge fundamental assumptions underlying their conception of the culture. Novices and laypeople, however, were far less likely to seek a deeper understanding of the behavior. Consequently, they tended to consider superficial, alternative actions to rectify the situation, as compared with the experts. In the second, "hypothesis testing"-oriented vignette, the experts were more likely to consider the alternative hypothesis than novices and laypeople. Experts and (trained) novices stressed the importance of suspending judgment. Only the experts consistently leaned toward giving the benefit of the doubt while further attempting to understand the puzzling behavior. Finally, in both scenarios, experts were more likely to mention the importance of considering culture in their explanations for the cultural surprises than novices or laypeople.

Limitations

The present research has shown some success in investigating metacognitive strategies within cross-cultural interactions, yet also had some limitations. Open-ended think-aloud protocols were collected to understand how people react cognitively to surprising cross-cultural behaviors, with an emphasis on metacognitive strategies related to improving culture-appropriate

explanations of those behaviors. As is typical for think-aloud investigations, the current study involved relatively few participants as compared with large-scale survey research studies. The effects being examined were of medium to large size, as indicated by the ORs, enabling statistically significant results for the samples collected. One direction for future research would seek to obtain converging validation of the results with larger samples of participants performing simpler, structured tasks that allow for more efficient data collection and processing, yet afford similar insight into metacognitive responses.

Another potential limitation is that the current procedure examined only the initial phase of the full cultural sensemaking process, and as such, reflected a "one-shot" attempt to understand the situation. In that single-shot attempt in the inquiry scenario, for example, experts were more likely to ask "why did that occur." A more complex, interactive procedure would enable inquisitive participants to actually seek out further information and find answers to their questions. For example, the experts would presumably be more likely to arrive at improved explanations in such a procedure and implement better solutions, given their greater propensity to inquire in the current task. More interactive procedures along these lines have sometimes been used in studies of scientific reasoning (Dunbar, 1993). It would be useful to construct and implement similar task environments for further investigation into the cognitive and metacognitive processes underlying cultural sensemaking.

Implications

The present study lends empirical support to notions that an important part of cross-cultural competence involves metacognitive processes invoked to cope with cultural surprises. At the outset, we identified five core processes and strategies that we hypothesized to be associated with competent cultural sensemaking, including noticing anomalies, instantiating a general cultural schema, inquiring into causes, considering alternative explanations, and suspending judgment. The empirical evidence provided strongest support for instantiating a general culture schema, inquiring into causes, and considering alternative explanations as aspects of cultural sensemaking expertise. Some support, albeit mixed, was also found for suspending judgment. Although cross-cultural experts mentioned the importance of suspending judgment in a heated situation more than laypeople, trained novices were just as likely to mention it as the experts. This result may suggest that cultivating an attitude of willingness to suspend judgment in such matters is fairly widely endorsed and adopted at present. The possibility should be further investigated, perhaps with more emotionally charged scenarios that make it more difficult to remain calm and suspend one's judgment. Experiencing culturally surprising behavior can be decidedly unpleasant, evoking negative affect that closes off further productive thought about the event (Matsumoto et al., 2001). By strengthening emotional impact as a variable within the situation, we may gain a stronger test of differential ability to suspend judgment. Finally, we did not find support for noticing anomalies as a differentiator. This is likely due to a ceiling effect with the particular materials used, as most people attended to the anomaly across experience levels. Future tests with scenarios and task requirements that increase the difficulty for noticing anomalies are needed to better determine the relative contribution of the strategy to cultural sensemaking and cross-cultural competence. A related possibility for future research along these lines would be to develop and test a typology of cultural situations and surprises, and to then map the corresponding metacognitive strategies that support cultural sensemaking within each class. This would enable a more refined examination of the precise conditions under which each strategy applies, as well as their distinctions and interrelations. In the present study, we found few significant correlations between strategies, and those were fairly modest, suggesting that the strategies represent relatively distinct skills that pertain to making sense of unexpected behaviors. The present and suggested future research thus moves in a direction advocated by Van Dyne and colleagues (2012) toward narrowing and further refining theoretical conceptualization in CQ and cross-cultural competence.

In the present study, we examined metacognitive strategies that individuals may use to resolve cultural surprises. Another important line of research has been the investigation of relations between individual personality characteristics and intercultural adaptability, broadly speaking (e.g., Van Oudenhoven & Van der Zee, 2002). A natural question is whether and how trait-like personality characteristics such as "open-mindedness" and "flexibility" might relate to the adoption of metacognitive strategies. One possibility is that personality serves as a precursor to metacognitive strategy employment, which then enhances cultural adaptability. For example, people who report greater flexibility (as measured by self-report with items such as "I work according to a strict scheme" or "I avoid surprises" indicating lack of flexibility), might be more apt to suspend their judgment about unexpected behaviors. Although intuitively compelling, a "mediation hypothesis" along these lines has been studied in the context of CQ and received mixed support (Ward & Fischer, 2008). An alternative possibility is that there are particular metacognitive strategies that people may acquire that aid in resolving cultural surprises, but that specific implementation of the strategies depends on personality. For example, someone who reports the tendency to work according to a strict scheme and has adopted metacognitive strategies might study a great deal about a culture prior to a visit to avoid being surprised to the extent possible. In general, the relations between acquired strategies associated with cultural sensemaking competence and personality traits are likely to be fairly complex.

A related issue concerning metacognitive strategies for cultural sensemaking has to do with the possibility of their acquisition by individuals who have little preexisting cross-cultural experience. Metacognitive strategies are sometimes discussed as especially advanced skills, ones that cannot possibly be learned by individuals who have not already amassed considerable experience operating in a foreign cultural milieu. However, the term *metacognition* has been used in two distinct senses, and it is important to separate the specific meaning intended to evaluate this claim. One way that metacognition has been used is as it is here, that is, with reference to learning and reasoning strategies used to resolve cultural surprises. Another process that is sometimes referred to in discussions about metacognition involves cultural frame switching, that is, quickly and effortlessly drawing on second (or *n*th) cultural knowledge to interpret a situation (Benet-Martínez, Leu, Lee, & Morris, 2002; Klafehn, Banerjee, & Chiu, 2008). Metacognition in this sense certainly requires deeply encoded, highly accessible cultural knowledge that is unlikely to be acquired without considerable direct experience.

Our contention here is that metacognitive strategies in the former sense can be learned with little or no cross-cultural background. Indeed, we suspect that early acquisition of such strategies could prove useful for efficiently acquiring deep culture-specific knowledge from experiences, as needed to support more advanced processes such as cultural frame switching. The current findings show it is possible to identify and codify individual metacognitive strategies involved in cultural sensemaking, such as asking questions that tap explanatory reasoning. This result indicates that such strategies might be explicitly taught and fostered in the context of intercultural training. Consider research into self-explanations as an example of how similar metacognitive strategy identification and development has proceeded in the cognitive science of instruction. Using a think-aloud approach with 10 participants, Chi and colleagues found that generating explanations to oneself (self-explaining) directly facilitates the integration of new into existing knowledge (Chi, Bassok, Lewis, Reimann, & Glaser, 1989). These researchers showed that the specific metacognitive strategy of self-explanation was relevant to the acquisition of problem-solving skills when studying worked-out examples. Specifically, the best learners were found to spontaneously generate many self-explanations that refined and expanded their understanding as they studied examples from a text, whereas poor learners did not. Subsequent work further demonstrated that self-explanation facilitates learning when it is explicitly promoted (Chi, De Leeuw, Chiu, & Lavancher, 1994), and the initial results have been replicated by a variety of researchers.

That is, self-explanation is a readily adopted and effective strategy when taught to novices. To teach metacognitive strategies most effectively in the context of cross-cultural interactions, further research is needed to determine whether prompting and training specific strategies will indeed accelerate cultural learning. Cross-cultural training that emphasizes metacognitive strategies early on may help to accelerate cross-cultural competence by providing sojourners with the means to gain more from future experiences.

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Declaration of Conflicting Interests

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Note

1. Malle's (2004) analysis clarifies some ambiguities in the usage of "attribution," though in one common use attribution formation means giving an explanation of behavior.

References

Alberdi, E., Sleeman, D. H., & Korpi, M. (2000). Accommodating surprise in taxonomic tasks: The role of expertise. *Cognitive Science*, *24*, 53-91.

Ang, S., & Van Dyne, L. (Eds.). (2008). *Handbook of cultural intelligence: Theory, measurement, and applications*. Armonk, NY: M. E. Sharpe.

Ang, S., Van Dyne, L., Koh, C., Ng, K. Y., Templer, K. J., Tay, C., & Chandrasekar, N. A. (2007). Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. *Management and Organization Review*, *3*, 335-371. doi:10.1111/j.1740-8784.2007.00082.x

Archer, C. M. (1986). Culture bump and beyond. In J. M. Valdes (Ed.), *Culture bound: Bridging the cultural gap in language teaching* (pp. 170-178). Cambridge, UK: Cambridge University Press.

Atran, S., Medin, D. L., & Ross, N. O. (2005). The cultural mind: Environmental decision making and cultural modeling within and across populations. *Psychological Review*, *112*, 744-776.

Barton, S., & Sanford, A. (1993). A case study of anomaly detection: Shallow semantic processing and cohesion establishment. *Memory & Cognition*, *21*, 477-487. doi:10.3758/bf03197179

Benet-Martínez, V., Leu, J., Lee, F., & Morris, M. W. (2002). Negotiating biculturalism. *Journal of Cross-Cultural Psychology*, *33*, 492-516. doi:10.1177/0022022102033005005

Bhawuk, D. P. S., & Brislin, R. W. (2000). Cross-cultural training: A review. *Applied Psychology: An International Review*, *49*, 162-191.

Bhawuk, D. P. S., Sakuda, K. H., & Munusamy, V. P. (2008). Intercultural competence development and triple-loop cultural learning. In S. Ang, & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, method, and applications* (pp. 342-355). Armonk, NY: M. E. Sharpe.

Brislin, R. W., Cushner, K., Cherrie, C., & Yong, M. (1986). *Intercultural interactions: A practical guide*. Beverly Hills, CA: Sage.

Chi, M. T. H., Bassok, M., Lewis, M. W., Reimann, P., & Glaser, R. (1989). Self-explanations: How students study and use examples in learning to solve problems. *Cognitive Science*, *13*, 145-182.

Chi, M. T. H., De Leeuw, N., Chiu, M.-H., & Lavancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science*, *18*, 439-477. doi:10.1207/s15516709cog1803_3

Chinn, C. A., & Brewer, W. F. (1993). The role of anomalous data in knowledge acquisition: A theoretical framework and implications for science instruction. *Review of Educational Research*, *63*, 1-49.

Dunbar, K. (1993). Concept discovery in a scientific domain. *Cognitive Science*, *17*, 397-434.

Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis: Verbal reports as data* (Rev. ed.). Cambridge, MA: MIT Press.

Fiedler, F. E., Mitchell, T., & Triandis, H. C. (1971). The culture assimilator: An approach to cross-cultural training. *Journal of Applied Psychology*, *55*, 95-102.

Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, *51*, 327-358.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, *34*, 906-911.

Gauld, C. (1982). The scientific attitude and science education: A critical reappraisal. *Science Education*, *66*, 109-121.

Gelfand, M. J., Erez, M., & Aycan, Z. (2007). Cross-cultural organizational behavior. *Annual Review of Psychology*, *58*, 479-514.

Gentner, D., & Stevens, A. L. (1983). *Mental models*. Hillsdale, NJ: Lawrence Erlbaum.

Gourgey, A. F. (2001). Developing students' metacognitive knowledge and skills. In H. J. Hartman (Ed.), *Metacognition in learning and instruction: Theory, research and practice* (pp. 17-32). Dordrecht, Netherlands: Kluwer Academic.

Graesser, A. C., Baggett, W., & Williams, K. (1996). Question-driven explanatory reasoning. *Applied Cognitive Psychology*, *10*, S17-S31.

Haddock, C. K., Rindskopf, D., & Shadish, W. R. (1998). Using odds ratios as effect sizes for meta-analysis of dichotomous data: A primer on methods and issues. *Psychological Methods*, *3*, 339-353.

Hugh-Weiner, G. (1986). The "learning how to learn" approach to cross-cultural orientation. *International Journal of Intercultural Relations*, *10*, 485-505.

Kim, Y. Y. (1991). Intercultural communication competence. A systems-theoretic view. In S. Ting-Toomey, & F. Korzenny (Eds.), *Cross-cultural interpersonal communication* (pp. 259-275). Newbury Park, CA: Sage.

Klafehn, J., Banerjee, P. M., & Chiu, C.-Y. (2008). Navigating cultures: The role of metacognitive cultural intelligence. In S. Ang, & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications* (pp. 318-331). Armonk, NY: M. E. Sharpe.

Koehler, D. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin*, *110*, 499-519.

Kuhn, D. (2000). Metacognitive development. *Current Directions in Psychological Science*, *9*, 178-181. doi:10.1111/1467-8721.00088

Kulkarni, D., & Simon, H. A. (1988). The process of scientific discovery: The strategy of experimentation. *Cognitive Science*, *12*, 139-176.

Malle, B. F. (2004). *How the mind explains behavior: Folk explanations, meaning, and social interaction*. Cambridge, MA: MIT Press.

Mathieu, J. E., Goodwin, G. F., Heffner, T. S., Salas, E., & Cannon-Bowers, J. A. (2000). The influence on shared mental models on team process and performance. *Journal of Applied Psychology*, *85*, 273-283.

Matsumoto, D., LeRoux, J., Ratzlaff, C., Tatani, H., Uchida, H., Kim, C., & Araki, S. (2001). Development and validation of a measure of intercultural adjustment potential in Japanese sojourners: The Intercultural Adjustment Potential Scale (ICAPS). *International Journal of Intercultural Relations*, *25*, 483-510. doi:10.1016/s0147-1767(01)00019-0

Mynatt, C. R., Doherty, M. E., & Tweney, R. D. (1978). Consequences of confirmation and disconfirmation in a simulated research environment. *Quarterly Journal of Experimental Psychology*, *30*, 395-406.

Ng, K., van Dyne, L., & Ang, S. (2009). From experience to experiential learning: Cultural intelligence as a learning capability for global leader development. *Academy of Management Learning & Education*, *8*, 511-526.

Osland, J. S., & Bird, A. (2000). Beyond sophisticated stereotyping: Cultural sensemaking in context. *Academy of Management Executive*, *14*, 65-79.

Rohner, R. P. (1984). Toward a conception of culture for cross-cultural psychology. *Journal of Cross-Cultural Psychology*, *15*, 111-138.

Sandoval, W. A., & Reiser, B. J. (2004). Explanation-driven inquiry: Integrating conceptual and epistemic scaffolds for scientific inquiry. *Science Education*, *88*, 345-372.

Sanford, A. J., & Graesser, A. C. (2006). Shallow processing and underspecification. *Discourse Processes*, *42*, 99-108. doi:10.1207/s15326950dp4202_1

Schraagen, J. M. (1993). How experts solve a novel problem in experimental design. *Cognitive Science*, *17*, 285-309.

Schunn, C. D., & Anderson, J. R. (1999). The generality/specificity of expertise in scientific reasoning. *Cognitive Science*, *23*, 337-370.

Sieck, W. R. (2010). Cultural network analysis: Method and application. In D. Schmorrow, & D. Nicholson (Eds.), *Advances in cross-cultural decision making* (pp. 260-269). Boca Raton, FL: CRC Press.

Sieck, W. R., Grome, A. P., Smith, J., & Rababy, D. A. (2010). Expert cultural sensemaking in the management of Middle Eastern crowds. In K. L. Mosier, & U. M. Fischer (Eds.), *Informed by knowledge: Expert performance in complex situations* (pp. 105-121). New york, NY: Taylor & Francis.

Sieck, W. R., Merkle, E. C., & Van Zandt, T. (2007). Option fixation: A cognitive contributor to overconfidence. *Organizational Behavior and Human Decision Processes*, *103*, 68-83.

Taylor, E. W. (1994). Intercultural competency: A transformative learning process. *Adult Education Quarterly*, *44*, 154-174. doi:10.1177/074171369404400303

Triandis, H. C. (1975). Culture training, cognitive complexity, and interpersonal attitudes. In R. Brislin, S. Bochner, & W. Lonner (Eds.), *Cross-cultural perspectives on learning* (pp. 39-77). New York, NY: Wiley.

Triandis, H. C. (2006). Cultural intelligence in organizations. *Group & Organization Management*, *31*, 20-26.

Van Dyne, L., Ang, S., Ng, K. Y., Rockstuhl, T., Tan, M. L., & Koh, C. (2012). Sub-dimensions of the four factor model of cultural intelligence: Expanding the conceptualization and measurement of cultural intelligence. *Social and Personality Psychology Compass*, *6*, 295-313.

Van Oudenhoven, J. P., & Van der Zee, K. I. (2002). Predicting multicultural effectiveness of international students: The Multicultural Personality Questionnaire. *International Journal of Intercultural Relations*, *26*, 679-694. doi:10.1016/s0147-1767(02)00041-x

Wan, C., Chiu, C.-Y., Peng, S., & Tam, K.-P. (2007). Measuring cultures through intersubjective cultural norms: Implications for predicting relative identification with two or more cultures. *Journal of Cross-Cultural Psychology*, *38*, 213-226. doi:10.1177/0022022106297300

Ward, C. (2004). Psychological theories of culture contact and their implications for intercultural training and interventions. In D. Landis, J. M. Bennett, & M. J. Bennett (Eds.), *Handbook of intercultural training* (3rd ed., pp. 185-216). Thousand Oaks, CA: Sage.

Ward, C., & Fischer, R. (2008). Personality, cultural intelligence and cross-cultural adaptation: A test of the mediation hypothesis. In S. Ang, & L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications* (pp. 159-173). Armonk, NY: M. E. Sharpe.

Wiley, J., Goldman, S., Graesser, A. C., Sanchez, C. A., Ash, I., & Hemmerich, J. (2009). Source evaluation, comprehension, and learning in internet science inquiry tasks. *American Educational Research Journal*, *46*, 1060-1106.

Yates, J. F., Ji, L.-J., Oka, T., Lee, J.-W., Shinotsuka, H., & Sieck, W. R. (2010). Indecisiveness and culture: Incidence, values, and thoroughness. *Journal of Cross-Cultural Psychology*, *41*, 428-444.