CHAPTER NINE

Athletes, Murderers, and a Chinese Farmer: Cultural Perspectives on Sensemaking

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Introduction

In naturalistic contexts, people often need to make sense of complex and sometimes contradictory information to prepare for effective decision making. This presents a problem for teams. If three people work together in a complex and dynamic situation, each may identify a different 'sense' of the situation. This is because sensemaking depends on past experiences and current goals as well as on how each person attends to, selects, categorizes, and integrates available information. These processes are sensitive to individual but also to national differences in cognition.

The increased internationalization of transportation, commerce, communication, and technology has dramatically increased global interdependence. The expansion of social, technical, and economic systems across national borders has made it more common for multicultural teams to work together on planning, coordination, decision making and other complex tasks. Professionals are more likely to be asked to make predictions about what allies, competitors, or adversaries might do. This means professionals need good information. Advances in technology are expanding the availability of information. Finding information on the Internet and elsewhere is not a problem; facing the confusion and contradictions in this information can be overwhelming. These trends contribute to the

urgency of understanding national differences in cognition that influence information use and sensemaking in complex and dynamic environments.

Our research group has collected naturalistic data in a variety of international setting. In samples of multinational peacekeeping personnel, commercial pilots, and international students in U.S. universities, we have identified cognitive differences in how people from different groups work together. We have learned that people from different groups sometimes have dramatically different views about how teams should function with regard to monitoring, team orientation, leadership, trust, and communication (Klein and McHugh, 2005). This chapter addresses national differences in cognition that may influence how people search for information and select from the information available; how they handle contradictory and/or changing information; and how they organize and categorize this information to make sense of new situations. Differences in performing macrocognitive tasks, including sensemaking, make team coordination difficult, common ground evasive, and prediction error-prone. Without an understanding of the impact of national differences on sensemaking, multinational interactions will remain haphazard.

We make the case that sensemaking, like other macrocognitive processes, is shaped by cognitive differences that vary over national groups. Understanding these national differences in cognition can improve team functioning during multinational interchanges and allow people to better anticipate how people of other national groups will act. Moreover, an understanding of national differences can do more than support multinational interchanges and improve predictions. Currently, it is primarily Western researchers using Western research paradigms with Western participants who undertake research on macrocognition. Extending our study to national variations in cognition can fundamentally

alter and extend our understanding of sensemaking and other macrocognitive functions including planning, coordination, and common ground. This can make the macrocognitive framework more universal and add testable hypotheses to our research programs.

In this chapter, we will explore four national differences in cognition: Attention, Causal Attribution, Tolerance for Contradiction, and Perception of Change. These have been documented in laboratory studies, which may shape the way people use information and understand the natural world. Naturalistic and laboratory researchers have sometimes been considered to be warring armies. We believe this is a mistake. To understand why we have borrowed laboratory data to address sensemaking, a macrocognitive processes, we need to look at the goals of naturalistic decision making. Naturalistic decision making emerged, in part, to capture the richness of real world contexts and in part as a response to the limitations of parametric laboratory research. The existence of limitations in field research does not mean that we must choose between the two. Rather, just as traditional experimental researchers might enrich their science by considering the outcomes of naturalistic studies to formulate better laboratory questions, so too would NDM researchers do well to use laboratory outcomes to identify new dimensions and approaches to understanding cognition in the world. It is in this spirit that we turned to laboratory research on Analytic and Holistic thinking to suggest national differences important during sensemaking in naturalistic settings.

Before we begin this examination of culture and sensemaking, a few caveats are needed. First, most research on culture and cognition has compared Westerners, people from English speaking nations and northern Europe, with East Asians, principally people from Japan, Korea, and China. These comparisons probably do not capture the variations in

cognition found worldwide and may even distort some groups. A full review will have to wait until we have a broader representation of nations in the research literature. Second, while comparisons among national groups have shown clear cognitive tendencies in cognition for specific groups, we make no claim that these tendencies describe every person. To do so would ignore the power of individual differences. Third, cultures are dynamic systems that emerge from a particular setting and that change with modernization and contact with other groups. We cannot assume that patterns identified in a nation's rural communities will describe patterns among urban people or that patterns identified in the past are true today. The patterns we identify are only meant to be useful starting points understanding a particular group. Finally, national groups differ in many ways: customs, behavior, values, ideologies, and social roles. The emphasis in this chapter is on cognition and not on the other important ways in which national groups differ.

In this chapter, we define sensemaking within the macrocognitive framework and outline some of the demands that make it vulnerable to national differences in cognition. We present the four cognitive differences identified in laboratory settings, describe how each is linked to cognition in natural settings, and suggest how each might influence the course of sensemaking. Finally, we describe the implications of these differences for sensemaking and more generally for macrocognition.

Sensemaking

> You are driving to an important meeting in a GPS-equipped rental car in an unfamiliar city. You have the directions from your host. You need to attend to the road, stay alert for unexpected driving patterns, and watch for your next turn. If there is a conflict between the GPS and your directions, you will have to decide what to do; if you make an error, you will need to figure out how best to recover. As you approach your destination, you will need to watch for parking places.

In such complex situations, we may face an unpredictable stream of information – the trajectories of other vehicles, obscure or hidden street signs, confusing or contradictory directions, and unfamiliar driving customs. While much of the available information may be ignored, some of it demands immediate explanation, interpretation, and action. *"Why did that happen?" "What does this mean?" "What should we do now?"* We must organize, interpret, and use the information to make sense of continual changes by differentiating what is relevant from irrelevant (Choo, 1998). People use their past experiences to interpret and reinterpret situations and to form possible explanations as new information becomes available. *Sensemaking* is the process that people use to identify compelling problems, construct meaning, select frameworks for new information, and provide causal explanations (Weick, 1995). It builds on other macrocognitive processes, such as problem detection and problem identification, and it triggers and guides adaptive planning and decision making. If successful, it can guide us to our important meeting on time.

Sensemaking begins when a person becomes aware of a compelling problem: a change, anomaly, or surprise in the stream of information (Thomas, Clarke, and Gioia, 1993; Weick, Sutcliffe, and Obstfeld, 2005). The recognition of any of these can initiate the gathering of additional information (for example, Thomas, Gioia, and Ketchen, 1997). Categorizing information allows us to verify findings by comparing similar cases, past and present. This may help suggest plausible explanations or propose effective actions. Making sense of situations in this way can lead to effective action by individuals and by organizations (Daft and Weick, 1984). Actions, in turn, produce changes in the environment that reflect on the effectiveness of one's sensemaking. This can allow closure,

propel additional action, or suggest reinterpretations (Thomas, Shankster, and Mathieu, 1994). In this way, sensemaking is a dynamic and ongoing process.

Klein, Phillips, Rall and Peluso (forthcoming) suggest a data/frame model of sensemaking to describe the deliberate effort undertaken to understand events. They propose that incoming information can suggest frames – mental models for organizing and understanding. These frames are similar to Minsky's (1975) notion of frames as structures for representing known situations. They may include information about dynamic relationships among components, expectations for the future, and appropriate actions. The frame helps to delineate what counts as data and guides the search for additional information. Contradictions and inconsistencies may provide cues for elaborating the frame or reconsidering previously discarded data. If people cannot explain events by elaborating their initial accounts, they must question their frame, perhaps rejecting it and shifting to another in their repertoire. People differ in how hard they work to preserve their original frame. They may, for example, be lured down a 'garden path' to explain away inconsistent data by deciding that the data is unreliable. Some people may track several frames and, as events develop, compare these frames to find one that fits best. Both Weick's and Klein *et al*'s frameworks identify crucial sensemaking processes. Their formulations suggest several questions about sensemaking and the variation it exhibits. The answer to each question may vary across national groups.

What is an anomaly or problem? Identifying a problem is important but what is considered a problem may differ from one person to another and from one national group to another. This is especially true when problems are ill-defined. When problem identification differs, the subsequent sensemaking will also differ.

What frames are available to provide an initial sense of the situation and how is one selected in a particular case? People use their own experiences to suggest frame(s) for a specific situation and these frames guide further exploration. When people have had different experiences, they are likely to use different frames. To the extent that national settings provide different experiences, these experiences can shape the pool of available frames for the group.

What is the range and content of information considered? A compelling problem may call for additional investigation and action. Information is considered based on its relevance to the current sense of the situation and the explanatory frames that are being used. Because people use differing frames, the information they select can differ. Even when there is a common frame for understanding, people may vary in the scope and the types of information to which they attend. Because national groups differ in the range and amount of information considered relevant, selection and the sensemaking that follows is likely to vary.

How is material categorized or otherwise organized? In order to deal with the large store of available material, people categorize information (Hamilton and Trolier, 1986). Differences in categorization can reduce information overload but at the same time can change subsequent information gathering and lead to differences in sensemaking.

What counts as an explanation? Sensemaking helps explain ongoing events in a way that allows for future actions. When people differ in causal beliefs, they will accept different causal explanations. This can generate different action plans.

How open are people to new or contradictory information? In dynamic situations, people often face contradictory information and this has been exacerbated with

the advent of the Internet. There are individual differences in openness to new and to contradictory information: what it takes to change frames during sensemaking. If there are national differences in how people deal with contradictory information, these can also influence sensemaking.

These questions about sensemaking are part of our ongoing research agenda. When people from different nations work together on complex problems, the processes underlying sensemaking sometimes show considerable variability. National groups may bring their own distinct cognitive styles to teamwork. Predicting the actions of those from other nations is more difficult if there are cultural variations in cognition.

In the next section, we review the origins and nature of four dimensions of Analytic-Holistic Thinking: Attention, Causal Attribution, Tolerance for Contradiction, and Perception of Change. We describe how these cultural differences may influence what is considered a problem, the information deemed necessary to address a problem, and the way it is attended to, selected, categorized, interpreted, and used to make sense of complex situations. Each of the differences can shape the course of sensemaking in natural settings and can introduce confusion in multinational settings.

Cultural differences in cognition

People from Western nations, including Americans, tend to be Analytic thinkers and focus on objects and dispositions. Those from Eastern Asia show more Holistic thinking and focus on relationships. Analytic thinkers view the world as composed of separate elements that can be understood independently while holistic thinkers focus on the relationships among different elements (Nisbett, 2003). Choi, Koo, and Choi (under review) propose four dimensions of Analytic-Holistic thinking. These dimensions provide the conceptual

basis for the present analysis. The dimension of *Attention* defines the scope of information considered or needed: Analytic thinkers focus on central features in the field while Holistic thinkers attend to the field as a whole. *Causal Attribution* directs the search for explanations to situational or dispositional causes. Analytic thinkers target dispositional causes while Holistic thinkers include situational causes. *Tolerance for Contradiction* describes the difference between Analytic differentiation, polarizing goals and options to define the most important, on one hand, and Holistic naïve dialecticism, merging goals and options by synthesis, on the other. *Perception of Change* describes beliefs about change, whether phenomena are viewed as linear by analytic thinkers or as cyclical, non-static patterns by holistic thinkers. These national differences in cognition can make sensemaking vulnerable to cultural differences.

Analytic and holistic differences can be understood from two perspectives. First, the Ecocultural Model provides a framework for understanding how ecological constraints are related to perceptual and cognitive differences leading people from different ecological settings to see the world differently. The work was based on field work with 21 traditional groups, from North America, Africa, Australia, and Europe engaged in a variety of subsistence patterns including farming, herding, hunting and gathering. Berry (1976) reported political stratification, social stratification, and family organization as they related to cognitive and perceptual functioning. He reported consistent relationships between ecological demands on the one hand and perception and cognition on the other. These ecocultural constraints provide a lens through which members of a group see the world (Klein, 2004).

Patterns of cognition are relatively enduring because they grow out of the socialization practices within a particular culture, and they have survival value for people in that culture. Groups who, in recent generations, engaged in hunting and gathering, for example, are more likely to exhibit field independent perception while those who have, in recent generation, engaged in farming are more likely to exhibit field dependent perception (Berry, 1986). Adults who have these adaptive skills are likely to be more successful in their culture.

Cognitive patterns appear to be perpetuated by social structure and childrearing patterns. Caregivers model and reinforce the patterns successful in and characteristic of the culture. The role of caregivers in shaping cognition is seen in the difference between the childrearing of Japanese and Americans. Fernald and Morikawa (1993) report how Japanese mothers use few labeling nouns and many more verbs when playing with their babies. This serves to focus the infant's attention on relationships and the context of objects, "See the mother feeding the little girl." In contrast, American mothers label many objects and focus on categories of objects when playing with their babies, "Let's put all the red blocks in this box." These lessons from the early years of life are consistent with later cognition. The Japanese adult looks for relationships while the American looks for distinctions.

A second perspective for understanding Analytic-Holistic differences comes from Richard Nisbett's recent work. Nisbett (2003) asserts that the analytic and holistic systems of thought originated from two ancient philosophic traditions: Greek Aristotelian thought and Chinese Confucius thought, respectively. The Greeks saw power as located in the individual's sense of personal agency. Their Analytic thinking is seen in the tradition of

debate (Cromer, 1993), the rule-based understanding of the world (Lloyd, 1991), and the speculative creation of causal models about the nature of the objects and events. In contrast, the Chinese tradition held a sense of reciprocal social obligation or collective agency. Individuals felt that they were a part of a large and complex system where behavior should be guided by the expectation of the group. In ancient China, debate was not generally encouraged (Cromer, 1993). Understanding of the natural world proceeded by intuition and empiricism rather than formal models (Lloyd, 1991). The social system focused attention on the larger broader picture and cultivated holistic thinking.

The four dimensions, attention, causal attribution, tolerance for contradiction and perception of change, considered in this chapter stem from the *Analytic-Holistic* distinction (for example, Nisbett, 2003; Nisbett, Choi, Peng, and Norenzayan, 2001). These dimensions are further explored below.

Attention

Our attention allows us to limit the information available for sensemaking in a complex environment. Consistent with early mother-child communication patterns, holistic thinkers, including East Asians, attend to the relationships among objects and context. They see the whole picture emphasizing relationships and interconnections, a more field interdependent view, at the expense of a focal object. Also consistent with early communication patterns, analytic thinkers, including most Westerners, look to individual objects and items rather than to the field as a whole. The Westerners pay more attention to individual parts and they are more field independent. How might this look in the cockpit of a commercial plane?

> There can be a lot going on in the cockpit during an emergency- multiple conversations with multiple people talking to the pilot – it is impossible to process them all. Flight instructors and check pilots report a

> common trend: Middle Eastern and Chinese pilots have more trouble with prioritizing information during overload. They are less able to 'turn off' the low priority conversations. They work to attend to all of them and often miss the most important input. It is as if they are afraid to miss anything because they give it all equal importance (Klein, Klein, and Mumaw, 2001).

These observations illustrate differences in how different cultural groups see and attend to their auditory world. Westerners typically focus on focal information, even to the expense of contextual information. Other groups appear to share attention to focal information with more contextual information including conversations and routine functions. The strength is that this information may be more available for later use. The cost is less attention to immediate, focused demands.

Masuda and Nisbett (2006) looked at these same phenomena in the laboratory. They showed Americans, presumably analytic, and Japanese, presumably holistic, a set of video clips depicting an aircraft in flight over a crowded airfield. A large aircraft, a medium sized plane, and a helicopter are in the foreground. Peripheral objects such as control tower and additional planes appeared in the background. In the animated clips, there were changes related to the plane in flight and the large aircraft on the ground, the focal objects, and in the peripheral objects and context. Participants were asked to report changes from the first to the last frame. The set of video clips include many changes in the physical environment so the viewer can only attend to some of it. The goal was to capture attention difference between the American and Japanese samples. What did they see? The more analytic Americans noticed more changes in properties such as color, shape, and number of the aircraft in flight. They noticed, for example, changes in the position of the flight aircraft's wheel. They were less likely to notice changes in the background or the distance between the helicopter and planes. The Japanese participants noticed more changes in background,

for example, the control tower in the background and the changes in the distance between the helicopter and the planes indicating attention to relationship between two objects. They noticed fewer changes in the plane, the focal object.

Differences in attention are not limited to the physical environment but have also been shown using social stimuli in a simple but elegant experiment. Masuda and his colleagues (Masuda *et al*., under review) showed Americans and Japanese participants 56 stimuli each consisting of a central cartoon figure together with four smaller background cartoon figures. The facial expression of the central figure was depicted as Happy, Neutral, or Sad. The smaller figures for each stimulus were depicted as Happy, Neutral, or Sad. When Americans rated the emotion of the central figure, their judgment focused on the central figure, uninfluenced by the emotions of the background figures. In short, they performed as requested. In contrast, the Japanese participants modulated their judgments to reflect the emotions of the small surrounding figures. If a neutral figure was surrounded by happy figures, they rated the figure as more happy. This study found no consistent gender by culture interaction. In a later study, Americans, Japanese, Koreans and Taiwanese, were asked to make this same judgment. The Americans attended to the central figure while participants from the three East Asian groups modulated their judgments of the central figure by the emotions of the background figures (H.A. Klein *et al*., 2006). They attended to the social context of the cartoon figure not just the figure alone. These holistic thinkers are likely to have more peripheral social information available for later use.

East Asians were also found to attend to both background information and focal information in solving complex decision making tasks. Strohschneider and Guss (1999) gave Asian Indians and Germans an interactive computer simulation of a small semi-

nomadic tribe. They were asked to take the role of a developmental aide worker and work to improve the conditions of the tribe over time. To do this, they could ask for information they thought necessary. Even though Indian participants generally asked for less information than did the German participants, they asked for more background and context information, such as the social conditions, in their effort to accomplish their task.

In a similar study, Gelfand, Spurlock, Sniezek and Shao (2000), extended the role of attention to judgments of information usefulness. Participants were given relational or individuating information about a target person they were to interact with across four situations. They were asked to rate the usefulness of the information and how confident they thought they were in predicting their own and the target's behavior across the four situations. Chinese students saw relational information - social groups, family, social class - as more useful for predicting their own and other person's behavior, whereas US students favored individual information such as personal accomplishments (Gelfand *et al*., 2000). Because of this difference, it is likely that analytic and holistic thinkers would have different information available at the beginning and during sensemaking.

Sensemaking starts with awareness of an anomaly or problem that focuses attention. It continues to the selection and evaluation of a frame to provide a sense of the situation. When national groups differ in their initial attention to the visual field, to social context, and to problem space, they are likely to notice different anomalies. When people vary in the range of information they consider relevant, they will have different examples and counter examples for use in sensemaking. Holistic thinkers may use information more intuitively because they have more information available to consider. Analytic thinkers may favor rule or cost-benefits analysis because they attend to a narrow set of information. Taken together,

attention appears to direct problem identification and set the stage for subsequent sensemaking.

Causal Attribution

Attribution describes how people assign cause (Heider, 1958) and so directs the selection and use of information. Dispositional attribution identifies internal causes such as competence, personality, and values as most explanatory. Situational attribution looks also to external causal factors such as task demands, environment barriers, and surrounding people. Analytic thinkers, including Westerners, typically attribute behavior to the actor's disposition (Gilbert, Pelham, and Krull, 1988) while ignoring situational causes (for example, Gilbert and Malone, 1995). Holistic thinkers, including East Asians, use both situational and dispositional factors to identify the driving forces for behavior and events (for example, Choi *et al*., 1999; Morris and Peng, 1994). Because both dispositional and situational factors are included, sensemaking is likely to be systemic in nature.

To study the differences in attribution as reflected in press coverage, Markus and her colleagues (Markus, Uchida, Omoregie, Townsend, and Kitayama, 2006), reviewed Japanese and American media accounts from the 2000 and 2002 Olympics for explanations of Olympic performances. Coverage from 77 Japanese athletes and 265 Americans athletes were coded and analyzed. The analysis provided contrasting responses to a journalist's question, " How did you succeed?" as recorded in a respected newspaper from their native nation. Would it be dispositional, hard work and discipline, or situational, the support received from teammates and a good night's sleep the night before? The Japanese accounts included more categories describing athletes' positive and negative personal attributes, background, and social and emotional experience. American media accounts included

fewer categories and emphasized positive personal characteristics and features of the competition. Capturing this difference, one Japanese athlete responded, “Here is the best coach in the world, the best manager in the world, and all the people who support me – all of these things were getting together and became a gold medal. So I think I didn’t get it alone, not only by myself.” In contrast, an American, responded, “ I think I just stayed focused. It was time to show the world what I could do. I am just glad I was able to do it. I knew I could beat Suzy O’Neil, deep down in my heart I believed it, and I know this whole week the doubts kept creeping in, they were with me on the blocks, but I just said, “No, this is my night.”

In a follow-up laboratory study, participants reviewed the explanations from both Japanese and American media and chose the most relevant information about the Olympic athletes (Markus *et al*., 2006). Responses mirrored that of each national press: the Americans favored dispositional explanations while the Japanese used more categories and found the situational components more compelling.

Morris and Peng (1994) address the question of attribution, looking at media treatment of two well-covered mass murders. One of the crimes was committed by a Chinese graduate student and the other by an Irish-American postal worker. The researchers reviewed, coded, and analyzed dispositional and situational attributions provided by the articles related to the crime over a two-month period published in New York by The New York Times and the Chinese-language World Journal. The English language news paper accounts reflected significantly more dispositional attributions. They describe the graduate student as having a “very bad temper,” and “psychological problems with being challenged” and the postal worker as “man was mentally unstable,” and “had

repeatedly threatened violence". The Chinese language newspaper provided more situational explanations for the graduate student - "did not get along with his advisor," and was "isolated from the Chinese community", and for the postal worker – "gunman has been recently fired" and "followed the example of a recent mass slaying in Texas."

The researchers then asked American and Chinese graduate students to rate probable causes and their importance as well as things that might have averted the tragedies. Their judgments were consistent with the journalistic report: the American students included more dispositional causes and rated them as more important while the Chinese students included both dispositional and situational causes and rated both as important. Taken together, this research confirms attribution differences.

Choi, Dalal, Kim-Prieto and Park (2003) used Morris and Peng's (1994) murder incident to confirm the attributional differences between groups. They asked participants to read a scenario describing the murder:

> Suppose that you are the police officer in charge of a case involving a graduate student who murdered a professor (the dead professor was the graduate student's advisor). Why would the graduate student possibly murder his or her advisor? As a police officer, you must establish the motive.

After reading this scenario, participants were given a list of 97 potentially useful facts for making sense of the murder. They were asked to indicate which of the facts they considered irrelevant. For example:

> Whether or not the graduate student was unhelpful.
>
> Whether or not the professor was religious.
>
> Whether or not the graduate student was far away from his/her hometown.
>
> Whether or not the graduate student liked rock music.

Americans, with their analytic thinking, excluded more information as irrelevant than did a sample of Koreans when they make sense of the scenario (Choi *et al.*, 2003). The same difference was found when Americans were compared to samples of Japanese, Korean, and Taiwanese students (H.A. Klein *et al.*, 2006), all presumably holistic thinkers. Overall, Westerners attended to a more focused range of information while holistic thinkers attend to information that is more diverse (Choi, Choi, and Norenzayan, 2004).

An early laboratory study provided a parallel indication of the influence of attribution on sensemaking. Miller (1984) presented Americans and Hindu Indians with this scenario describing a motorcycle accident:

> This concerns a motorcycle accident. The back wheel burst on the motorcycle. The passenger sitting in the rear jumped. The moment the passenger fell, he struck his head on the pavement. The driver of the motorcycle – who is an attorney – as he was on his way to court for some work, just took the passenger to a local hospital and went on and attended to his court work. I personally feel the motorcycle driver did the wrong thing. The driver left the passenger there without consulting the doctor concerning the seriousness of the injury – the gravity of the situation – whether the passenger should be shifted immediately – and he went on to the court.

Participants were asked why the driver left the passenger at the hospital without staying to consult about the seriousness of the passenger's injury. While both Americans and Indians mentioned the state of the driver at the time of the accident as a reason for his leaving, the Americans were more likely to attribute the behavior to the disposition of the driver, such as irresponsibility or drive to succeed at work. The Indians, in contrast, were more likely to also mention situational attributions, such as responsibilities and obligations at work. One accident, different attributions.

Research into causal differences also suggests the power of information. Choi and Nisbett (1998) manipulated information saliency in a scenario to determine causal attribution outcome. When situational information was limited, both Koreans and Americans used dispositional attribution to explain outcomes. However, when situational information was salient, Americans ignored the information that did not fit their dispositional frame while Koreans were likely to change frames. In making sense of an organizational scenario, Lin (2004) presented Malaysians and Americans with scenarios consisting of both dispositional and situational information. They were then given recognition tests of the information presented in the scenarios and attribution assessments of the scenarios. Participants' holistic tendencies were also measured. The study found Malaysian to be more holistic in their thinking than Americans. They remembered significantly more situational information and identified both dispositional and situational explanations while Americans rated situational causes as less likely. The different value placed on situational information would be expected to lead to different explanations during sensemaking.

Causal attribution and categorization appear to be linked. People who favor dispositional explanations appear to group objects and concepts using objective traits while those who favor situational explanations group by relational characteristics. We can see this difference in a simple task. *What goes with the cow? Chicken or grass?* If you categorize based on dispositions, you will categorize the cow with the chicken because they are both animals. If you categorize based on situational attributions, you will group the cow with the grass because cows eat grass. Norenzayan *et al*. (2002) found that Japanese participants typically chose relationship-based categorization with the most similar attributes grouped

while US participants were more likely to use single attributes and formal rules. Similarly Ji and colleagues (Ji, Zhang, and Nisbett, 2004), showed participants sets of three words, for example: 'Cow –Milk – Pig' or 'Foot –Shoe – Hand'. When asked to identify the pair that belonged together, East Asians categorized based on relationships (that is, foot and shoe) while Americans favored dispositional categorization (that is, cow and pig). Faced with a complex task, people may seek a frame that uses a category based on past experience. If we experience stomach distress, we may categorize it with our last experience with stomach distress. If that was appendicitis, we might rush to the hospital while if it was a minor flu, we might drink hot tea. Classification can support sensemaking and decision making by guiding the selection of comparison cases. Classification may also make it easier to access information later to revise the sense of the situation.

Because people from different cultures begin with distinctive causal explanations, they may attend to, value, and accept different information. They categorize information using different dimensions, generate different explanations for situations, and make different predictions for future events (Choi *et al*., 1999; Choi and Nisbett, 1998; Ji, Nisbett, and Su, 2001). These differences shape their sense of the problem space and direct their planning and decision making. This can create problems in settings where exchanges of information are important. Differences in attribution can mean preference for different information management processes, one that are rich with related or connected information and the other, focused but detailed information. When multinational team members seek and retain different information this can take them in different directions.

Tolerance for Contradiction

Tolerance for Contradiction describes how people typically manage divergent information. Analytic thinkers avoid contradictions whenever possible (Peng and Nisbett, 1999). Information, goals, and options are polarized to identify the most important feature of a situation. Consistent with Analytic logic, each statement, philosophy, or technique must be true or false but not both. In contrast, holistic thinkers tend to use naïve dialecticism. They deal with contradiction by searching for the "Middle Way" between opposing propositions, retaining and synthesizing basic elements of each. Holistic thinkers tolerate contradiction because they see truth in opposing views (Peng and Nisbett, 1999).

Peng and Nisbett (1999) compared cultural folk wisdom reflected in everyday language using proverbs from traditional Chinese and American sources. A dialectical proverb contains contradiction. For example, "beware of your friends not your enemy" and "too humble is half proud". A nondialectical proverb contains no such contradiction. For example, "one against all is certain to fall" and "for example is no proof". They found four times as many dialectical proverbs in the Chinese source as compared to the American suggesting contradiction plays a larger role in the Chinese folk wisdom. They then asked American and Chinese research participants to evaluate the proverbs. American participants preferred nondialectical to dialectical American proverbs and the Chinese participants preferred dialectical to nondialectical Chinese proverbs. To control for familiarity of proverbs, Yiddish proverbs were used. Again, the result reflects a preference for dialectical proverbs by the Chinese than the American participants.

Two other domains capture differences in tolerance for contradiction. For the Western world, a religious system is seen as having integrity in its representation and

expression of truth. A person can be a Christian or a Moslem but not both. In contrast, the pattern of Japanese life may include Shinto, Buddhist and even Christian expressions. Chinese religious expression may incorporate both Buddhist and Taoist elements. For many people in Peru, Catholicism and traditional pagan worship stand side by side. These are not seen as conflicting but rather as capturing a broader reality.

Similarly, the Western world has generally adopted a biological model for healing. We demand medications and treatments based on sound science and research. While there is recent interest in holistic and alternative therapeutic approaches, mainstream medicine remains 'science' based. In contrast, in holistic cultures, the use of state-of–the–art science is not seen as incompatible with a wide variety of traditional healing practices ranging from herbs to rituals evoking the aid of higher powers. In these groups, shamans using rituals to counter the possibility of a curse as the source of illness, are not seen as contradictory to modern medicine.

Tolerance for contradiction influences openness to new and contradictory information during sensemaking. Dialectical thinkers seek potential truth in divergent positions while differentiation thinkers seek the correct explanation and explain away other options. Choi and Nisbett (2000) looked at cultural differences in the judgment of contradiction. In the Good Samaritan story below, taken from Darley and Batson's Good Samaritan study (Darley and Batson, 1973), the character is described as religious, generous, and helpful but also under time pressure and stress.

> John, a seminary student, is very religious, generous, and helpful. He is taking a sermon course and has to give a practice sermon as a course requirement. On the day he was supposed to give the sermon he was 10 minutes late for class. The professor was known to be harsh with students for being late. While John was

> rushing to class, he saw a man lying on the ground needing help. If John stayed to help he would not make it to class.

Participants were assigned to one of three conditions. They were told John helped the man, he did not help the man, or they were told nothing about the outcome. They were then asked about their expectations and reactions to alternative outcomes.

Choi and Nisbett (2000) expected that Koreans and Americans would react differently when given contradictory information and they did. The Koreans showed more hindsight bias than did the Americans in the 'no help' condition, accommodating this new information. They saw the conclusion opposite to their initial one as also plausible and were less surprised by it. Americans were more surprised when they were told John did not help the man, contradicting their expectation. The same finding was confirmed with a story where the target was described negatively but ended up doing a positive action. The Americans here also were more surprised by the new information. The Koreans were less influenced by the 'mismatch'.

To study this same distinction, Peng and Nisbett (1999) used pairs of statements to present possible conflicts to participants from China and the US. For example:

> A) A social psychologist studies young adults and asserted that those who feel close to their families have more satisfying social relationships.
>
> B) A developmental psychologist studies adolescent children and asserted that those children who were less dependent on their parents and had weaker family ties were generally more mature.

They queried East Asian and Western participants to see if statements A) and B) were seen as contradictory or if they would both be true? The East Asians, thinking dialectically,

understood the two statements as non-contradictory and parts of a whole rather than as dichotomous descriptions. They accepted the seeming contradiction as multiple perspectives of a single truth (Chu, Spires, and Sueyoshi, 1999; Nakamura, 1985). In contrast, differentiating reasoning which is typical of Westerners seeks constancy. Because contradictory propositions are unacceptable by formal logic, they believe that contradictory statements cannot both be true. Differentiation thinkers polarized the contradiction, decided which position was correct, and explained away the other position. They considered the propositions in a restricted context rather than embedded in a broader context (Cromer, 1993). Hence, Westerners saw statements A) and B) as opposing, and decided which one was correct.

During sensemaking, differences in tolerance for contradiction influence the way information is selected and retained. These differences provide conflicting paths in complex situations. Differentiation thinkers seek the best goal while dialectical thinkers seek a harmonious, intermediate goal. In choosing the best goal, the differentiation thinkers may reduce cognitive dissonance by avoiding or dismissing contradicting information. They may, however, exclude information needed as the situation unfolds, new information emerges, and existing frames must be reexamined or changed. Differential thinkers may also be more likely to seek out confirming rather than disconfirming information. They simplify information to reduce overload (O'Reilly, 1980; Weick, 1979). In contrast, dialectical thinkers may experience more information overload and have difficulty in settling on a course of action (Choi *et al*., 2000). At the same time, they may see more information as related (Choi and Nisbett, 2003) and so may experience little dissonance and be more prepared for change and surprise.

During sensemaking, information can reduce ambiguity (Weick, 1995). However, people who avoid contradictory information may err in not considering alternate positions and valid objections. People who are comfortable with contradiction remain open to new information longer. They may track several frames simultaneously so that they can merge frames or modify them. Their readiness to change their sense of the situation and their decisions may depend on how much they can prolong the sensemaking process. These differences can hinder collaboration when high tolerance people are more flexible in decision making and view the low tolerance people as rigid and/or if low tolerance people seek to complete work and view high tolerance people as indecisive.

Finally, tolerance for contradiction extends to criticism and self-appraisal. Differentiation thinkers are more likely to be threatened by information that questions their choices and are more likely to disregard unfavorable information. In contrast, dialectical thinkers may welcome unfavorable information and not necessarily evaluate it as threatening. Their awareness of situational constraints allows them to see the external pressures on their choices relieving a sense of failure or dissonance (Choi *et al*., 1999; Hiniker, 1969). Criticism may be seen as information that can lead to improvement.

Overall, differences in tolerance for contradiction mean that dialectical and differential thinkers may use conflicting information in different ways which may lead to differences in selection and retention of information. Together, these differences are expected to generate different problems, approaches, and goals for sensemaking and also for planning, decision making and team interaction.

Perception of Change

Perception of Change describes the belief about the nature of change. Is change viewed as a linear, monotonic pattern, or as a cyclical, dynamic pattern? Holistic thinkers appear to see the world as cyclical and so seek to understand one point in time by reference to long-term cyclic patterns of change (Nakamura, 1985). An ancient Chinese folk tale illustrates this cultural belief about change:

> One day an old Chinese farmer's horse ran away. His neighbors came to comfort him, but he said, "How can you know it isn't a good thing?" A few days later, his horse came back, bringing a wild horse with it. His neighbors came to congratulate the old man, who said, "How can you know it isn't a bad thing?" A few weeks later, the old man's son tried to ride the new horse and fell off, breaking his leg. Again, the neighbors came to comfort the old man, who said, "How can you know it isn't a good thing?" Some months later, a war broke out, and all the young men in the region were recruited for the war. The old man's son was spared because of his broken leg (adapted from Ji, Nisbett, and Su, 2001).

In contrast, Analytic thinkers have a linear view of change (Ji, Nisbett, and Su, 2001; Peng and Nisbett, 1999). Western folk tales reflect this perception of change. The hero or heroine is a wonderful person in an unfortunate situation but all comes out well in the end. Grimms' Tales for Young and Old capture this difference (Grimm and Grimm, 1977).

> Sleeping Beauty (Brier Rose in the German version) tells us that at the celebration given to celebrate her birth, one of 13 Wise Women of the realm was not invited and so placed a curse on the baby. Nevertheless, Sleeping Beauty "…grew to be so beautiful, so modest, so sweet-tempered and wise that no one who saw her could help loving her." While things were bad for a time—a pinprick and 100 years of sleep—in the end, her prince came and all turned out well. "The prince and Brier Rose were married in splendor, and they lived happily to the end of their lives." The lives of Snow White and Cinderella (Ashputtle in the German version) follow similar paths.

Holistic thinkers, like the old Chinese farmer, believe that reality, as a process, is always in flux and expect that ups and downs will alternate cyclically (Peng and Nisbett,

1999). They see everything in the world as connected with complex interactions among elements. In contrast, Westerners with their linear perspective, expect stability over time with few dramatic changes. The neighbor in the old farmer story represents this view as do the 'happily ever after' Grimm's fairy tales endings.

Predictions about change are part of how we make sense of the world. Ji, Nisbett, and Su (2001), asked Chinese and Americans to make predictions about the future patterns of twelve natural events including economic growth rates and world cancer death rates. They reviewed twelve graphs showing three points to indicate the development of the rate across three periods of time. For example, the points on the graph of global economy growth rates showed annual percentage change in real GDP, of 3.2%, 2.8%, and 2.0% for 1995, 1997, and 1999, respectively. Participants were asked to predict the probability for the trend to go up, down, and remain the same. They also indicated what they thought the next two points would be. The predictions could show growth or decline and the rate of change could accelerate or decelerate. Americans made more predictions consistent with the given trend whereas Chinese were more likely to deviate from trends making predictions in the opposite direction.

In a second study, Ji *et al*. (2001) asked people to predict the course of their own life happiness. American and Chinese participants were presented with eighteen trends: six linear and twelve nonlinear trends, four were parabolic nonlinear trends. They were asked to select the trend that best represented their expectations for happiness throughout their lifetime. The Chinese participants were likely to predict nonlinear rates of change or directions of movement, and parabolic nonlinear change for both rate and direction of

change. In contrast, Americans selected the linear trend, moving in one direction, to represent their life happiness.

Both studies found Chinese participants more likely than American participants to assume that upcoming events would deviate from the current trend and even reverse direction. Americans made predictions in the direction consistent with the current trends with more stability. The Chinese participants also reported greater confidence about their prediction than did Americans. The studies suggest that Americans may be more likely to respond to immediate information while the Chinese look at things holistically and from a long term perspective.

A concept of change provides a frame for making sense of an ongoing situation and for formulating expectations about an unfolding situation. Differences in beliefs about change and the resulting differences in expectations mean that different events are considered to be anomalous. When the view of the world is stable, there may be less need to review a frame. When the world is seen as in constant change, a person may be constantly reviewing the frame as well as anticipating change. This difference is important as a particular sense of how a situation might change guides planning and action.

Discussion

Implications for Sensemaking and Macrocognition

National differences in cognition shape the way people approach macrocognitive tasks. The Cultural Lens model describes the emergence and mechanisms by which cognition can vary for different national groups (Klein, 2004). As described by the Cultural Lens model, people see the world through different lenses. Each culture provides schemas for information management and sensemaking that tend to generate different interpretations

(Bhagat, Harveston and Triandis, 2002). Sensemaking is sensitive to cultural variations because it reflects the complex lives of people and their cognitive plasticity. The four dimensions described in this chapter illustrate how specific differences can shape the nature of sensemaking and other macrocognitive functions. A few examples illustrate this:

What is an anomaly or problem? Cultural differences in attention guide the detection of anomalies. For holistic thinkers, an anomaly or problem can be very broad encompassing the context and including situational, interactional, and systemic factors. In contrast, the analytic thinker focuses on features central to the task at hand. Cognitive notions about the nature of change also guide the identification of anomaly. A change in a trend is anomalous for analytic thinkers but not necessarily for holistic thinkers.

What frames are used to integrate information and provide a sense of the situation? For holistic thinkers, the solution to a problem is to find the middle way – a compromise position. Holistic thinkers may have more complex frames with interconnected causal factors. In contrast, for analytic thinkers, only the best option will do. Concepts of change also contribute because people with a cyclical rather than linear view about events may be more willing and ready to anticipate shifts in the flow of event and to incorporate this in their sense of a situation.

What is the range and content of information considered? Once an anomaly is identified, differences in attention shape the range of awareness and the search for sense. While analytic thinkers may discard information if it does not fit into the dominant frame, holistic thinkers may try to accommodate dissenting information by extending frames. They may be less likely to discard information as irrelevant because things are viewed as interconnected. Those who use a holistic approach may attempt to incorporate information

that supports seemingly contradicting goals. Because holistic thinkers, with their situational attribution, incorporate a wide range of information as potentially relevant, they are more likely to experience information overload. In contrast, analytic thinkers, using more dispositional attributions, focus on key information and so may lack contextual information when problems shift.

How is material categorized or otherwise organized? Causal attribution helps define salient categories for organizational schemas. Cultural differences in the nature of causal attribution will affect the categories and classification schemes employed by sense makers.

What counts as an explanation? Cultural differences in the nature of causal attribution will determine what counts as an acceptable explanation. Some people want single underlying cause while others look for a nuanced set of factors. The nature of the explanation is a key step towards sensemaking.

Openness to new or contradictory information. People with broad attributions, both dispositional and situational may be more open to contradictory information because they believe all information is part of a meaningful whole. People from cultures that tend to avoid contradiction may ignore or explain away potential contradictions. A rejection of contradictory information can lead to a cleaner sense but the sense may not reflect reality. Embracing contradictory information can lead to a more comprehensive and realistic solution but may overload information management capacity.

Implications for Team and Organizational Processes

Cultural differences in cognition can impose constraints on multinational teams and on organizations. Team sensemaking shares all the complexities of NDM because goals may

be ill-defined and consensus lacking, information may be incomplete and ambiguous, decision makers may be pursuing multiple or competing objectives, and real constraints limit the time available to manage the information at hand. National differences in cognition further complicate teamwork by shaping information sharing, and affecting communication patterns during collaboration. People from different groups may seek and transmit different information, assign different causes, and use different frames for sensemaking. Together these cognitive differences can lead to different senses of the situation resulting in different decisions about how to act. When the professionals who make up multinational teams encounter anomalies, unexpected events, and discrepancies with implications for their organizations, they may differ radically in their subsequent sensemaking, problem solving, and decision making (see also McHugh, this volume). Differences in cognition can have benefits by providing different views and diverse solutions. Understanding cultural differences may enable multinational teams to share information more effectively in order to arrive at a common understanding that is richer than the interpretation forged from any single cultural perspective.

The difficulties are even more pronounced in multinational organizations where cultural differences in cognition point to different problems and frames, and lead to different assessments of information and problem resolution (Bhagat, Harveston and Triandis, 2002). This is an important issue because organizational psychologists describe the importance for organizations to identifying information needs; acquiring, organizing, and storing information; developing information products and services; distributing information; and using information in order to continually learn (Choo, 1998; Cohen and Levinthal, 1990). The goal is to harness organizations' resources and

capabilities to enable the organization to make sense of and adapt to a changing environment. These processes are critical in complex domains such as international commerce, communication, military operations and aviation. However, Choo (1998) emphasized that information management must address the social and situational context of information use. In view of this, we propose that the theories of information management should include variation in cultural cognition. By understanding cultural differences, organizations have the opportunity to shape communication based on group's information needs and to be aware of the additional demands for consensus building.

Next steps

While this chapter suggests several relationships between culture and sensemaking, it also reveals gaps in the research literature and suggests an agenda for future work. We believe high priority needs to be given to several areas of research:

Additional Research

While we can describe conceptual links between cultural differences and sensemaking, there is little data available for directly testing these predicted links. We need both naturalistic observation studies and microworld experimentation to identify culture-related patterns of sensemaking in different groups. One reason for this void has been the dearth of paradigms for measuring sensemaking. New efforts are now underway to assess these complex processes (for example, Klein *et al*., 2006) which may provide tools for exploring the impact of national differences on sensemaking. Our laboratory is exploring methods to effectively describe and measure sensemaking patterns.

Additional Dimensions

While this analysis has explored four specific cognitive dimensions with implications for sensemaking, several other dimensions may also contribute to sensemaking differences across national groups and deserve research attention. *Tolerance for Uncertainty* describes reactions to uncertainty (Hofstede, 1980). This may influence comfort with incomplete information and dynamic change. *Hypothetical-Concrete Thinking* describes the distinction between thinking that is based on abstract speculation and thinking that is grounded in the reality of past cases (Markus and Kitayama, 1991). Hypothetical thinkers would select frames and attend to information that allows hypothesis-driven sensemaking while concrete thinkers would seek past cases to understand current anomalies and suggest solutions. National groups also differ in their *Time horizon*. Some look to the distant future while others look to the days or weeks ahead (Kluckholn and Strodtbeck. 1961). This is reflected in the scope of sensemaking and the information considered. *Mastery-Fatalism* describes the efficacy people feel for taking action and making changes (Kluckholn and Strodtbeck, 1961). It may influence reactions to problems and the kinds of solutions seen as plausible. The frames available to people would reflect their expectations for efficacy. In organizational settings, social and interpersonal differences may also be powerful forces. *Power distance* describes the extent to which members of a group expect and accept the uneven distribution of power (Hofstede, 1980). During team sensemaking, high Power Distance can reduce input from lower status group members hastening decision making while reducing the engagement and input of knowledgeable group members (see also McHugh, this volume).

Managing Information

In a myriad of domains including military, transportation, and business, information management is both important and vulnerable during sensemaking. Blunders in these domains can compromise judgment and decision making (Choo, 1998). Information management is vulnerable because the *supply* of information is immense and varied in content, reliability, and accuracy. People must have enough data to identify the problem but excessive information can make it difficult to 'see' what is relevant. Overload, not scarcity may be the bigger challenge, because information is often managed under time pressure and stress (Choo, 1998). An important direction for future research will be to describe the role of cultural cognition on the mechanisms underlying information management. Research underway in our laboratory is exploring the role of culture-linked cognition on information management.

Additional Regions

Current research has focused on comparisons between Western and East Asian groups. This is an important start but leaves a number of important regions almost untouched. These include South America, sub-Saharan Africa, Southeast Asia, Eastern Europe, the Arab Middle East, and the Indian subcontinent. We need a better understanding of these regions for two reasons. First, the dimensions of difference we study are ones seen between the West and East Asia. To understand human variation, we need to look at a broader range of civilizations. Second, among the less studied regions are ones with great importance for commerce and conflict resolution. Our ongoing research includes samples from both Southeast Asia and India extending the available information in these critical regions (Klein *et al*., 2006).

Conclusion

As long as macrocognition is grounded primarily in research with Westerners, we can only claim an understanding of Western thinking, not human thinking. Sensemaking is a good starting point for describing the effect of cultural differences on macrocognition. These processes are sensitive to cultural variations because they are embedded in the complex lives of people who vary in upbringing, ecocultural constraints, and social pressures. Our understanding of macrocognition will gain as we appreciate the variations possible for pursuing each of these functions. The inclusion of cognitive variations in our descriptions of sensemaking may help to describe this complex, dynamic process, and the variations it exhibits around the world. Future efforts should extend this work to other complex processes including decision making and planning/replanning.

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