DISTINGUISHING FACTS AND OPINIONS IN NEWSPAPER ARTICLES: A CROSS-CULTURAL STUDY BETWEEN CHINESE AND AMERICANS

JING FENG

Sichuan University, BA, 2000

Mentor
Mitchell Rabinowitz, PhD

Readers
John C. Houtz, PhD
Joseph G. Ponterotto, PhD

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DEDICATION

This work is dedicated to my parents Yueli and Liangji, my husband Paul and my son Ryan Edgar.

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Abstract

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Jing Feng, PhD

Fordham University, New York, 2012

Mentor: Mitchell Rabinowitz, PhD

The purpose of this study was to examine how Chinese and American college students categorized facts and opinions in newspaper articles. The participants included 71 Chinese college students who were attending a big national university in Southwest China and 72 American students recruited from a private university in New York City. The stimulus material was administered through SurveyMonkey, an online survey service. The results indicated that Chinese participants were more likely to categorize statements taken from *China Daily* as facts. Also, Chinese participants tended to favor statements taken from news articles regarding Program for International Assessment (PISA) scores. As for American participants, there appeared to be consensus in the context of general statements and in the news articles regarding Chinese currency. No agreement was found in the Chinese sample. The results of pattern analysis showed in both cultural groups facts were primarily represented by Pattern 6. As categorizing facts, Chinese participants tended to use Pattern 5 more frequently than their American counterparts in the articles regarding Chinese currency. As categorizing opinions, participants in both cultural groups were more likely to use patterns which included "I agree" (i.e., Pattern 4, 5, 6) than patterns which included "I disagree" (i.e., Pattern 1, 2, 3). Moreover, it was found that Chinese participants were more likely to use a pattern of disagreement than American participants.

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CHAPTER I

THE PROBLEM

Introduction

Over the last two decades, Richard Nisbett and his colleagues have conducted a series of cross-cultural studies and found that East Asians (e.g., Chinese) and Westerners (e.g., Americans) perceive and analyze their worlds in different ways (Ji, Peng, & Nisbett, 2000; Ji, Zhang, & Nisbett, 2004; Nisbett, Peng, Choi, & Norenzayan, 2001; Norenzayan, Smith, Kim, & Nisbett, 2002). The researchers characterized East Asians' thinking system (e.g., Chinese, Japanese, Koreans) as holistic, referring to a thinking mode that emphasizes relationships and connections to the context and reasoning based on experience and intuition. Nisbett and his colleagues (2001) implied that the holistic mode of thought has been primarily influenced by Chinese Confucius culture which promotes harmony, an orientation toward the group, and a hierarchical social order. The Chinese culture strongly represents a "collective" culture where people tend to perceive "oneness" with other people (Hui, 1988; Hui & Triandis, 1986). Therefore, the conceptual framework of Hui and Triandis (Hui, 1988; Hui & Triandis, 1986) proposes an emphasis of collectivism. That is the tendency of making decisions and acting in accordance with others, and sharing each other's successes and failures.

Westerners' thinking system, described as analytic, focuses on the detachment of the object from its context and reasoning based on rules and logic (Nisbett et al., 2001). According to the researchers, the analytic mode of thought has been deeply affected by the ancient Greek culture which is in favor of an individualistic or independent social orientation. As compared to the Chinese culture, the ancient Greek culture puts emphasis on "self and independence" rather than "group and the complex interpersonal relationship" (Nisbett et al., 2001). The ancient Greek

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culture as typically representing the Western culture carries major characteristics of "individualism." The individualists separate themselves from others (e.g., Kagicibasi, 1997; Markus & Kitayama, 1991). People in this culture tend to seek independence and autonomy in judgment, decision making and actions (Markus & Kitayam, 1991).

Nisbett and his colleagues' research suggested that cultural background may affect people's cognitive processes. Research examining cognition across East Asian and Western culture primarily focused on four basic cognitive processes: attention and perception, categorization, attribution, reasoning/dialectical thinking.

Attention and Perception

Cultural differences in attention and perception are commonly discussed in the context of two cognitive styles: field dependence and field independence (e.g., Nisbett et al., 2001; Witkin & Berry, 1975). The terms field dependence and field independence are used to designate two major cognitive styles in the area of perception and attention (Cole & Scribner, 1974). A person with a field-dependent style should be attending to the social environment and organize the world in terms of relationships among events in the environment. A person with a field-independent style perceives the world in a way that the object is separated from the field, and organizes the world based on his/her logical analysis (Berry, 1981, 1991; Cole & Scribner, 1974; Nisbett et al, 2001; Witkin & Berry, 1975).

A growing body of research has shown that East Asians (e.g., Chinese, Japanese) are more likely to be field dependent and the Westerners (e.g., Americans) tend to be more field-independent (Choi & Nisbett, 1998; Hong, Chiu, & Kung, 1997; Kitayama & Masuda, 1997; Lee, Hallahan, & Herzog, 1996; Miller, 1984; Morris & Peng, 1994; Peng & Nisbett, 1999). For example, Ji et al. (2000) conducted a study to test whether Chinese are more field-dependent

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than Americans. The researchers presented participants with Rod-and-Frame Test developed by Witkin and his colleagues (as cited in Ji et al., 2000). In this task, the participant looks into a rectangular box framing a rod that sits inside it. The task is to report when the rod appears to be vertical. The study found that Chinese participants made more errors on the test than did American participants indicating that Chinese were more influenced by the position of the frame. The results suggested that it is more difficult for Chinese than Americans to isolate and analyze an object while ignoring the field in which it is embedded. Similar findings were discussed in a study of examining attention to the field between Japanese and Americans (Masuda & Nisbett, 2001). The researchers presented realistic animated scenes of fish and other underwater objects to Japanese and Americans and asked them to report what they had seen. In describing details of the fish, the researchers found that Japanese participants made around 70% more statements than Americans about background aspects of the environment (e.g., "There was a lake or pond.") The results indicated that Japanese perception of the object is oriented to the field in which it is attached.

The cognitive model of field dependence and field independence provided a theoretical foundation for research looking at cultural differences in people's perception. In research involving Japanese and American college students, Masuda, Gonzalez, Kwan and Nisbett (2008) conducted two studies looking at how participants perceive people's facial emotions. It was found that Japanese participants' perception and attention were more likely to be affected by surrounding objects or environment than their American counterparts. The results supported the assumption that East Asians (e.g., Japanese) held a tendency of field dependence where they attached the object to the field and viewed things as a whole; whereas, Westerners (e.g., Americans) were inclined to separate the object from the field and viewed things piece by piece.

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Empirical evidences of East Asians being field dependent versus Westerners being field independent were also found in a study looking at whether different thinking systems (holistic versus analytic) would affect people's webpage perception (Dong & Lee, 2008). The experiment presented a webpage prototype to a group of Chinese, Koreans, and Americans. As a result, people from a holistic thinking system (i.e., Chinese and Koreans) tended to browse a webpage by scanning the entire page, that is, perceive the context and the field as whole. People from an analytic thinking system (i.e., Americans), however, appear to focus on each piece of information one-by-one. They also appeared to pay attention to the page title and read the navigation bar while few of Chinese and Korean participants did so. The results indicated East Asians who are holistically-minded tended to be field dependent; whereas, Westerns who are analytically-minded tended to be field independent.

Categorization

Given East Asians' focus on relationships and contexts versus Western people's attention to the object and its properties, the two groups were expected to organize the world differently (Nisbett et al., 2001). Research has found that Westerners organized the world into categories and use rules more than East Asians; whereas East Asians were more inclined to organize in terms of similarities and relationships (e.g., Chiu, 1972; Choi, Nisbett, & Smith, 1997; Gentner & Medina, 1998; Smith, Patalano, & Jonides, 1998; Unsworth, Sears, & Pexman, 2005). For example, in a study investigating how Chinese and American children form categories, Chiu (1972) found that Chinese tended to group objects based on their relationships and the context; whereas, Americans tended to categorize objects into certain groups. Ji et al. (2000) found the same results as Chiu (1972) did with adult Chinese and American students. Participants were asked to describe verbally which two of three objects were most closely related. The results

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showed that Chinese were more likely to group objects based on some kinds of relationships, either functional (e.g., pencil and notebook) or contextual (e.g., sun and sky). In contrast, Americans were more likely to group objects on the basis of some feature shared within a category, such as notebook and magazine. Using Chiu's (1972) sorting task, Unsworth et al. (2005) also found that East-Asians may group objects based on relationships as well as category membership; whereas, Americans had a stronger tendency towards using categories to organize information.

In addition, the effect of language was examined to see whether it intervened the cultural effect on categorization between Chinese and European Americans (Ji et al., 2004). The results suggested that a cultural effect was found to be significant regardless of language. Moreover, Gutchess et al. (2006) conducted research examining whether the effect of culture on categorization would vary by age. The results suggested that cultural differences in categorical organization were larger for elderly adults than young adults. There was an interaction effect between culture and age on categorization.

Attribution

In addition to the cultural differences in perception and categorization, research has also shown East-West differences in causal attribution which studies how people explain and understand the causes behind behaviors and environmental occurrences. East Asians tended to use more contextual factors in explaining persons and behaviors, whereas Westerners see behavior as a product of someone's internal dispositions and would not pay too much attention to situational factors (Hong, Chiu, & Kung, 1997; Norenzayan, Choi, & Nisbett, 2001; Lee, Hallahan, & Herzog, 1996; Miller, 1984; Morris & Peng, 1994). Some cross-cultural studies of causal attribution looked at how Eastern and Western people differ when they were asked to

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describe a person (self or other), which provided people an opportunity to infer what kind of causal theory of behavior they have. For example, Shweder and Bourne (1982) asked Hindu Indians and Americans to describe their acquaintances and found that Hindu Indians' descriptions were referred much to roles, social identities, and occupations that were more likely to be contextual variables. Comparatively Americans' descriptions spoke more toward personality traits which were personal variables. Miller (1984) demonstrated the same pattern when studying how people described each other. The researcher found that when explaining other people's behaviors Hindu Indians stressed contextual determinants of behavior. For example, one Hindu adult participant discussed a deviant behavior involving an agent's cheating a customer out of money paid for work. The Hindu participant explained the behavior by reference to the agent's socioeconomic position: "The man is unemployed. He is not in a position to give that money." In contrast, Americans emphasized dispositional characteristics. For example, an American adult discussed a deviant behavior involving an agent cheating on her income tax return. The participant explained the neighbor's behavior by reference to her personality characteristics: "That's just the type of person she is. She's very competitive."

In a self-description test, Cousins (1989) found that Japanese described themselves using more contextual variables; whereas, Americans described themselves in a more abstract and general way. The tendency that East Asians' self- descriptions were more concrete and social than those of Americans was also found for Koreans (Rhee, Uleman, Lee, & Roman, 1995) and Chinese (Ip & Bond, 1995; Triandis, McCusker, & Hui, 1990).

East-West differences were also found in how people explain a variety of behaviors. Joan Miller (1984) compared social explanations of Hindu Indians with Americans. The results showed that Americans explained their acquaintances' behaviors in terms of corresponding

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people's dispositions and traits; whereas, Hindu Indians explained similar behaviors in terms of context-specific factors such as social roles and obligations. In addition, Morris and his colleagues (Morris, Nisbett, & Peng, 1995; Morris & Peng, 1994) conducted research among Chinese and American participants looking at how they understood and explained two murder cases that had occurred in the United States. It was found that when explaining murder cases Chinese participants were more likely to attribute causes to situational factors such as social norm, media influences, etc; however, American participants' explanations were more related to the murderer's/victim's personal dispositions, for example, many American participants thought the murderer was "mentally unstable."

The similar results were also found in a study examining how Japanese and American participants evaluating consequences of a series of events (Maddux & Yuki, 2006). In general, Japanese participants perceived social events as affecting a larger number of people. They also perceived themselves as more responsible for the indirect and distal consequences and felt worse about these indirect consequences. In a more recent study of looking at how Chinese and Americans view responsibilities of a murder case, Hou and Tang (2009) found that in Chinese judgment the intention of the "murderer" and consequence of the event plays a big role in the Chinese's judgments about responsibility; whereas, American participants tend to attribute the "murderer" more responsibility for the results of the crime regardless whether or not the crime was intentional or unintentional. This indicated that Chinese tended to take into account more contextual factors in their attribution process than their American counterparts.

Reasoning and Dialectical Thinking

Throughout research looking at cognition across cultures, psychologists have documented East-West differences in the process of reasoning/logical thinking. Two different cognitive

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strategies have been found to be implemented in human thinking. One strategy was associative or similarity-based in nature which reflected temporal contiguity and statistical regularities among features. This cognitive strategy was described as intuitive, experience-based. The other strategy employed symbolic representations and logical structure using rules in analyzing the world. This cognitive strategy was described as formal, rule-based (Smith, Langston, & Nisbett, 1992; Tversky & Kahneman, 1983). The two different reasoning systems have reflected the cognitive outlooks of East Asian and Western cultures. Research has documented that East Asians, who were considered to be holistic, were more likely to base reasoning on their personal experience, make categorizations based on similarity and continuity, seek the "middle-way" when confronting contradiction; whereas, people in Western cultures, who were considered to be analytic, tend to use rules, abstract representations and base reasoning on their logical thinking (Norenzayan et al., 2002).

The most prominent research in examining the difference between rule-based and experience-based thinking was conducted by Norenzayan (1999). One of his studies looked at the learning of categories by application of rules versus using experience-based knowledge, such as exemplar memory. Rule-based categorization referred to categorizations made based on a rule and sufficient features. For example, if someone decides that his coworker is a bachelor because he satisfies the rule "bachelor is an unmarried adult male." Exemplar-based categorization, in contrast, was based on similarity relationships between the new object and exemplars stored in memory that share a set of features. The more similar the new object and the retrieved exemplar were, the more likely it was that the new object and the retrieved exemplar belong to the same category. In this case, the person would not judge whether his coworker was a bachelor based on the rule that "a bachelor is an unmarried male." Instead he may think his coworker was a

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bachelor because his coworker matched a lot of characteristics with his relative who is a bachelor.

Moreover, literature of reasoning indicated that East-West differences were also found in people's dialectical thinking, that is how people deal with contradiction. People with the higher level dialectical thinking are more likely to accept contradictions and vice versa. Peng and Nisbett (1999) conducted five studies in comparing Chinese and Americans in terms of the extent to which participants would accept different kinds of contradictions. The findings, in general, revealed that Chinese were inclined to accept contradictions and believe that truth lies on both sides; whereas, Americans were less likely to compromise to contradictions and regard truth as residing on one side. The results reflected a Confucius tradition of taking a "middle-way" in a contradictory situation and a Western philosophy in which formal logic is emphasized.

In contrast to the results found in Peng and Nisbett's research, Ho (2004) found that there were no cultural differences in dialectical thinking. The researcher, however, found a relationship between cognitive ability and dialectical thinking, that is higher cognitive ability is associated with better dialectical thinking. Differences were also found in three thinking dispositions in terms of their relationship with dialectical thinking. Higher need for cognition and hypothetical thinking were associated with better dialectical reasoning, while commitment to beliefs was associated with poorer dialectical thinking skills.

Research Questions

The research investigating East-West differences in cognition has established a foundation for the current study examining how people from Eastern and Western cultures evaluate and process information/knowledge which contains a mix of facts and opinions. More specifically, the first goal of the study is to investigate how people in the East Asian culture (i.e.,

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Chinese) and Western culture (i.e., American) evaluate knowledge, e.g., distinguish facts and opinions. It is assumed that people possessing different cognitive styles would present different strategies/patterns to distinguish facts and opinions.

The second goal is to investigate whether media sources would affect the perception of information. People learn about the world by acquiring information/knowledge from a wide variety of media such as newspapers, television, the internet, etc. In particular, the general public tends to heavily rely on newspapers to receive information regarding current events (Hoffman & Wallach, 2007). In a study conducted by the Pew Research Center for People and the Press (2002), over half of participants believed that the quality of newspaper reporting is the highest compared to other forms of media; however, Xiang and Sarvery (2007) noted that newspaper reporting can describe an event factually correct but convey different messages and stimulate different perceptions about the event. The extent to which the news reporting is accurate and objective had become a concern among newspaper readers (Hoffman & Wallach, 2007).

Media researchers use the term "media bias" to describe different perceptions created from an objective event by slanting information (e.g., Gentzkow & Shapiro, 2006; Hoffman & Wallach, 2007; Xiang & Sarvery, 2007). In particular, media bias has been well documented in coverage of U. S. politics (e.g., Ajami, 2001; Alterman, 2003; Coulter, 2003; Franken, 2003; Goldberg, 2003). In the United States, some people perceive the media as being biased toward the liberal (Coulter, 2003; Goldberg, 2003); others perceive the U.S. media as being biased in favor of the conservative (Alterman, 2003; Franken, 2003). Partisan bias is often perceived in newspapers. For instance, it is widely thought by conservatives that *The New York Times* is biased toward the liberal. The liberal bias of *The New York Times* was well demonstrated by Gentzkow and Shapiro (2006) comparing reports on the same event by *Fox News*, *The New York*

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Times, and *Al Jazeera*, an English-language web site of the Arabic language satellite network *Al Jazeera* (AlJazeera.net). The event was about a battle that American troops fought in the Iraqi city of Samarra on December 2, 2003. Based on the same set of underlying facts, there was an apparent different "take" on the event between the *Fox News*' story and *The New York Times*' story. While presenting the number of killings and injuries from the Iraqi side, Fox News reported the battle as a successful defense; while *The New York Times* commented on the battle saying the killings may instigate Iraqi anger against Americans and negatively affect U.S. involvement in Iraq. *The New York Times* comments reflected the perceived political inclination of being anti-war, while the *Fox News* comments were perceived by some as pro-war.

In the construct of media bias, the media outlets (e.g., newspapers) and individual journalists are accused of slanting information in news reporting (Hoffman & Wallach, 2007); however, some media researchers (e.g., Eveland & Shah, 2003; Lee, 2005) did not attribute biases in news to ownership of the media or journalist attitude. Instead, they thought media bias perception was related to an audience's own political preferences, ideological positions and personal interests (Lee, 2005). Bias perception research has suggested that in the context of news reporting, supporters of political groups or issues think the media unfairly favor their opponents (Beck, 1991; Gunther & Chia, 2001; Perloff, 1989). The construct of bias perception may explain the phenomenon that people who accuse the U.S. media of being liberal tend to be conservatives and people who accuse the U.S. media of being conservative tend to be liberals.

People's perception of the information in the context of news may be either influenced by biases that have already existed in newspapers or by readers' own preferences or inclinations in politics, ideologies, social values, etc. In the current study, the researcher used a methodology in which participants were asked to evaluate a set of statements selected from a Chinese and an

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American newspaper. The newspaper articles provided the study with a context where facts and opinions were mixed and can sometimes be controversial. In this context, there is often ambiguity as to what should be considered a fact versus an opinion.

In order to represent two different cultures, four articles regarding two topics were selected, two from a Chinese newspaper and two from an American newspaper. The American newspaper chosen to be used in the study was *The New York Times*, the Chinese newspaper chosen was *China Daily*. *The New York Times* is an American daily newspaper published in New York City. It is one of the largest metropolitan newspapers in the United States. According to the latest figures from the Audit Bureau of Circulations, for the six months ending in September 30, 2011 the total average circulation for *The New York Times* was 1,784,242 (see http://accessabc.wordpress.com/2011/11/01/the-top-25-u-s-newspapers-from-september-2011-fas-fax/). *China Daily* is the only national English-language newspaper in China. The average daily circulation is more than 200,000, one-third of which is abroad in more than 150 countries and regions. *The New York Times* is regarded as one of the most prestigious and well-respected newspapers. It is also considered representative of U.S. news media in general. *China Daily* is a principal representative of the Chinese press to non-Chinese speaking consumers of Chinese media (Ismail & Berkwitz, 2009).

The two newspapers obviously share similar features in that both have a large circulation and are influential domestically and abroad; however, the two newspapers are published in two nations that have distinctive press systems. The United States press is representative of a Western model of media which embodies the belief that government should not interfere in news collection and dissemination and that the press should be independent of authority (Hachten, 1999). Comparatively, China is among one of those countries whose press system is categorized

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as authoritarian, which differs substantially from that of the United States. In the authoritarian model, a news organization is prohibited from challenging, criticizing, or in any way undermining political machinery and officials in power. Diversity of views is not encouraged. Consensus and standardizations are promoted for mass communication (Hachten, 1999). Some media researchers describe the Western press system as "a watchdog of government that exposes injustice in the system," whereas, the press system in China has been viewed as a tool of ideological control for the authority, e.g., the Chinese Communist Party (Jiang, 2006; Pan, 2000).

The current study is a replication of a study that was conducted by Feng and Rabinowitz in 2007 looking at how Chinese and Americans distinguish facts and opinions. The researchers gave out a questionnaire which contains two major sections. In the first section, participants were presented with a set of statements of common knowledge that were considered to be unambiguous facts or opinion such as "Dogs are animals," "Children are happy and care-free." Participants were asked three questions about those statements: (a) how much do you believe the statement is true; (b) how much do you think other people believe the statement is true; and (c) do you think it is a fact or an opinion? In the second section, four articles regarding two topics were presented. Two articles for each topic were selected from *The New York Times* and *People's Daily* (the English version of a large Chinese daily newspaper). A set of statements were taken from each article for participants to evaluate followed by the same questions given in the first section. Based on the responses to the three questions, Feng and Rabinowitz (2007) derived six patterns with which participants would rate a statement.

The pre-assumed six rules are: Pattern 1 represents the condition where you do not think the statement is true and do not expect others to either. Pattern 2 represents that you do not think the statement is true but think others might or might not think it was true. Pattern 3 represents

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that you do not think the statement is true but think others would see it as true. Pattern 4 represents that you think the statement is true but believe others would think it was not true. Pattern 5 indicates that you think the statement is true but that other people might or might not think it was true. Finally, Pattern 6 represents a statement you think is true and believe others would also think is true.

The initial hypothesis in Feng and Rabinowitz's study (2007) was that a fact is something that you believe is true and think others would also judge to be true; whereas, an opinion is something that you think might or might not be true and others may or may not agree with it. The researchers found that Pattern 6 (I think it is true and I think others do also.) was predominately used by both Chinese and Americans in categorizing facts in the context of common knowledge and newspaper articles. However, Americans appeared to also use Pattern 5 (I think it is true, but others may or may not) to categorize a fact in the context of a newspaper article. In categorizing opinions, both Chinese and Americans seem to use a wide variety of rules rather than one or two specific pattern(s).

In examining whether culture, sources of statements (general knowledge versus newspaper articles) and newspaper article topic affect the number of facts and opinions that were categorized, Feng and Rabinowitz (2007) did not find any significant results. There was a consistency in categorizing facts and opinions in the context of common knowledge and newspaper articles (across the two topics) as well. The percentages of the statements categorized as fact and opinion were around 50% for both Chinese and Americans. The researchers also found that across the two participant samples, two sources of statements (general knowledge versus newspaper articles), and two newspaper article topics there was little consensus as to

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which were facts and which were opinions; however, the data showed a tendency that there was slightly more agreement among the Chinese participants than their American counterparts.

According to Feng and Rabinowitz's study (2007), both Chinese and American participants categorize a fact as something that they agree with and other people would also agree with; however, the Americans also regard a fact as something which they agree with and other people may or may not agree with. In fact, the researchers did not find either culture or the source of statements as a factor that significantly affected the agreement on certain statement as to whether it was a fact or an opinion. In addition, there was little consensus across the two culture samples and the two types of statements (common knowledge versus news paper articles). The results did not fully support the hypothesis that Chinese and Americans vary in the ways they categorize facts and opinions because of the East-West differences in cognitive processes.

It is worth noting that in Feng and Rabinowitz's study there were two apparent limitations that may have affected how conclusions were drawn. First, both Chinese and American participants were recruited using a convenient sample that resulted in a very small and nonrepresentative sample. Second, the Chinese sample was presented the questionnaire in a different way than the American sample. American participants completed the questionnaire in class, during class time; while Chinese participants were sent the questionnaire via email and completed the questionnaire independently at different times.

The main purpose for the current study to replicate Feng and Rabinowitz's study (2007) is to fix problems in Feng and Rabinowitz's study (2007). In the current study, the researcher worked to increase the size of the sample and distribute the questionnaire in the same manner for both American and Chinese participants.

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The current study examined the cultural differences in considering the effects of the sources of statements. Specifically, the study attempted to address the following questions: (a) if Chinese and Americans do categorize some statements as facts and some as opinions, is there consensus as to which statements are facts and which are opinions; (b) how do Chinese and Americans define facts and opinions; (c) There is a tendency for people to favor information that is in accordance with their preconception regardless of whether the information is true (Baron, 2000). So, are people biased as to how they interpret the information from different sources? For example, would American people agree more with statements selected from an American newspaper than those from a Chinese newspaper; and (d) if there is a bias, is it affected by culture? That is, which culture tends to be more biased on the sources of information? It is hypothesized that (a) Chinese are more likely to agree on certain statements as to whether it is a fact or an opinion than Americans; (b) the dominant criterion that both Chinese and Americans use to define a fact is that a fact is something that I agree with and I expect other people would agree with also; however, Americans are expected to use some other criteria to define a fact. In order to categorize an opinion, people from both cultures will use a variety of criteria rather than one; and (c) the sources of statements will affect the ways in which people categorize facts and opinions within and between the two cultures. It is expected that there is more likely a consensus as to which are facts and which are opinions among the common knowledge statements than the news article statements regardless of culture; Chinese tend to categorize more statements selected from the Chinese newspaper as facts than those from the American newspaper; whereas, Americans tend to categorize more statements taken from the American newspaper as facts than those from the Chinese newspaper. It is also expected that people from each culture are more likely to take those statements that favor or are close to their cultural or social value as facts

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regardless of article topics. These hypotheses are made based on the findings in Feng and Rabinowitz's study (2007) as well as the literature and empirical studies that documented the cognitive differences between East Asians and Westerners (e.g., Nisbett et al., 2001).

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CHAPTER II

REVIEW OF RELATED LITERATURE

In the early and mid-20th century psychological research was conducted primarily in industrialized societies like the United States and Western Europe. Relatively healthy, affluent Caucasian people were used as participants. Therefore, psychologists and researchers usually referred to mainstream psychology as Western psychology. The prevailing opinion in Western psychology was that it is a "natural science" that studies universal laws of human behaviors (Adamopoulos & Lonner, 2001; Jahoda, 1980; Segall, Dasen, Berry, & Poortinga, 1999). People of this opinion believed that human beings function universally based on these basic psychological processes regardless of different environments and cultures (Matsumoto, 2001; Sternberg, 1982).

In spite of the mainstream opinion of "universality of human thought and behavior" in psychology, there were several strands of independent efforts looking at "culture" as a determinant or at least an intervening variable in explaining human thought and behavior during the past century (e.g., Rivers' work as cited in Sternberg, 1982). A comprehensive review of the world's psychological literature (Lonner & Adamopoulos, 1997) showed that even the so-called father of modern experimental psychology, Wilhelm Wundt, was among the pioneers in exploring relationships between culture and basic psychological processes. Wundt (Wundt' work as cited in Sternberg, 1982) heavily criticized the theoretical perspective proposed by Lazarus and Steinthal (Lazarus and Steinthal's work as cited in Sternberg, 1982) that psychology was to study general laws governing the change and development of the mind. He claimed that the universal aspect of the development of higher mental processes should be analyzed in cultural-historical contexts. Wundt's basic idea strongly resembled the socio-historical approach of cross-

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cultural research today; however, no empirical evidence was provided by either Wundt himself or his followers to support this premise. It was not until the mid-to-late 1960s that independent and isolated research efforts in culture and psychology were connected and converged. Harry Triandis and John Berry were among the initiators. It was then that the modern cultural psychology movement was started.

Psychological Differentiations

The largest program of research in cross-cultural cognitive psychology has been pursued by John Berry and the late Herman Witkin emphasizing the concept of psychological differentiation (Sternberg, 1982). In early research, Witkin (Witkin's work as cited in Sternberg, 1982) proposed two cognitive styles that represented two different ways in which people perceived the physical world, i.e., a global style and an articulate style. In Witkin's theory, a person with the global style attended more to the environment, focused more on relations among events and tended to attach him/herself to the field; whereas, a person with the articulate style attended less to the field and was inclined to distinguish between phenomena that were internal and external to it.

Based on Witkin's cognitive style framework, John Berry characterized the two styles as field dependent (i.e., global style) and field independent (i.e., articulate style). The two terms indicated Berry's focus on the influence of the surrounding field on human's perceptual behavior. In an attempt to comprehend how ecological and cultural factors affect cognitive style development, Berry (1966, 1971, 1975, 1976, 1987) developed an ecocultural model and carried out his work within the model. Berry's model indicated that ecological and acculturational variables, to some extent, equally and independently contributed to the development of cognitive styles. The ecological element emphasized human interaction with environmental features (e.g.,

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temperature, rainfall, and soil quality). The different environmental features shaping up economic entities were referred to by Murdock (1969) as "exploitive subsistence pattern," where societies may be classified as gathering, hunting, pastoral, fishing and varieties of agriculture. Based on the classification of societies, Murdock (1969) developed two demographic patterns: "settlement pattern" and "size of population units." The "settlement pattern" classified people's life styles in their societies including fully nomadic, semi-nomadic, semi-sedentary, and fully sedentary. It was shown that hunting and gathering societies were predominantly nomadic or semi-nomadic with small population units, and agricultural and pastoral societies were predominantly sedentary or semi-sedentary with much larger population units.

Considering culture as an adaption to ecology, two cultural elements were incorporated into the ecological dimensions: social stratification and socialization. Nimkoff and Middleton (1960) found that social stratification can be linked to subsistence pattern that the bulk of the societies classed as "agriculture present" were also classified as "highly stratified," whereas, among the societies classified as "hunting or gathering" most were in the "low stratification" category. A possible relationship between ecology and socialization was found in a study looking at the cultural effect on child rearing practice (Barry, Child, & Bacon, 1959). The results showed that people in agricultural and pastoral societies tended to train their children to be "responsible" and "obedient," whereas, children in hunting and gathering societies were trained to be more "achievement-seeking," "self-reliant," and "independent."

For the acculturation element of the model, Berry (1976) included such factors as experience of western schooling, and availability of wage employment and the degree of urbanization. These factors may influence an existing culture and change it to some extent. It was evident that Berry's ecocultural model had some relevance for the theory of psychological

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differentiation (Witkin, 1978). A comprehensive review on the relationships between the model and the theory was provided by Witkin and Berry in 1975, which established a baseline for their later work looking at cultural variations in psychological differentiations. According to Witkin and Berry (1975), people with the field-dependent style were most likely to live in agricultural societies and be associated with a sedentary lifestyle, high population density, high social stratification, socialization emphasizing compliance, less western schooling and low wage employment; whereas, people with the field-independent style were most likely to live in hunting and gathering societies and be associated with a nomadic life style, low population density, low stratification, practices emphasizing assertion, more western schooling and high wage employment.

Since 1975, cross-cultural work has continued on the theory of psychological differentiation. The most prominent research based on the ecocultural framework was conducted by Sinha (1979, 1980) and his colleagues (Sinha, 1988; Sinha & Bharat, 1985) in India. The researchers looked at the effects of the ecocultural variables including the subsistence and settlement pattern (i.e., nomadic hunter-gatherers versus sedentary agriculturists; Sinha, 1979), family practices (three forms of marriage in the Cis-Himalayan region of India: monogamous, polyandrous, polygynandrous; Sinha & Bharat, 1985), and the experience of formal schooling; Sinha, 1988). The results showed significant group differences between nomadic hunter-gatherers and sedentary agriculturists, which supported the ecocultural model; however, this particular study only looked at the society type as a whole instead of examining the distinctive roles of ecological demands, social structures, and socialization practices. As a result, Sinha and Bharat (1985) did not find significant effect of family type/child rearing practices on cognitive styles; however, in a study looking at schooled and unschooled children in two ethnic groups in

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two contrasting ecological contexts (hills and plains) in Nepal, the authors (1988) found significant main effects for ecology and schooling. Schooling differences were considered to be consistent with previous studies and the cognitive differentiation theory showed the impact of formal education.

Collectivism and Individualism

In a comprehensive review of the theoretical frameworks, assumptions, and unique characteristics of the cross-cultural comparative approach in psychology, Berry and Sam (1997) noted that the ecocultural model had been one of the leading paradigms or frameworks in contemporary cross-cultural research. The authors also highlighted another noteworthy contemporary theoretical approach: collectivism-individualism. In the social sciences, the constructs of collectivism and individualism were considered to primarily define the characteristics of Eastern and Western worlds (Hsu, 1983).

According to Mills and Clark (1982), the constructs were defined by the definition of self and its perceived relation to a group, values relevant to group or personal goals and social interaction styles and patterns. The core element of collectivism was the emphasis of "oneness" with other people which implied an orientation toward group, interdependence, situation and social context (Cross, Bacon, & Morris, 2000; Hui, 1988; Hui & Triandis, 1986; Kagitcibasi, 1997; Markus & Kiayama, 1991). Hui and Triandis (1986) proposed a conceptual framework with three facets to underlie collectivism. The three basic facets were (a) consideration of other's opinion and decision, (b) sharing of each other's success, and (c) sharing of each other's failure. This framework reflected the essence of collectivism, i.e., people thought about how their behaviors and actions may affect the benefits and costs of others. Also, collectivists were expected to attain a goal through collective efforts and would share in the glory of each other's

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achievements. By the same token, they considered a person's failure as the whole group's failure. In contrast, the major characteristic of individualism seemed to be the "separateness" of oneself from others (Kagitcibasi, 1997; Markus & Kitayama, 1991) which implied a focus on the individual rather than the group. Compared with collectivism, individualists valued autonomy in judgment, decision making and actions, getting ahead of others, striving for personal achievements, and developing one's unique identity which was different than others. To summarize individualists' characteristics, three elements were drawn from the existing literature: independence, competitiveness and uniqueness (e.g., Markus & Kitayama, 1991; Singelis, Triandis, Bhawuk, & Gelfand, 1995; Triandis, 1989; Triandis & Gelfand, 1998).

Hofstede (1980, 1983) noted that individualistic culture dominated in most northern and western regions of Europe and in North America, whereas the collectivistic cultural pattern was common in Asia, Africa, Latin America and the Pacific. However, the literature showed that each collective or individual culture was likely to have unique aspects (Triandis, 2001). For example, arguments within the in-group were seen as undesirable in many East Asian collectivist cultures, where harmony within the group was a strong value. But in Mediterranean collectivist cultures, argument within the in-group was acceptable (Triandis, 2001).

Throughout cross-cultural research, the collectivist culture such as Chinese, Japanese, Korean and Singaporean mostly refers to East Asian cultures which were greatly influenced by Confucianism, a philosophy originated in ancient China. It promotes harmony, an orientation toward the group, and a hierarchical social order. Confucianism especially emphasizes obligations obtained between emperor and subject, parent and child, husband and wife, older brother and younger brother, and between friends. The organization of ancient Chinese society made the individual feel that they were part of a group, whether a family or village, and that the

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behavior of the individual should be guided by the expectations of the group. Such an emphasis on collective agency resulted in the Chinese valuing in-group harmony (Nisbett et al., 2001). The Western culture usually refers to Western European and North American culture which is greatly influenced by ancient Greek culture. Greek civilization is considered to give rise to European civilization and post-Columbian American civilization. One of the most remarkable differences between ancient Chinese and Greek culture is that the ancient Greeks developed a sense of personal freedom. The characteristics of the ancient Greeks are strongly related to their tradition of debate, that ordinary people participated in the debate of the marketplace and the political assembly and could challenge even a king (Nisbett et al., 2001).

This following presents a review of two lines of research in regard to culture and psychology. The first focuses on East-West differences in a variety of cognitive processes. The review of the research builds up a theoretical framework for the current study and provides empirical evidence in support of the hypotheses of the current studies. The second research looks at how people evaluate information, more specifically, how people distinguish facts from beliefs (opinions). The research was initially conducted within United States, a typical western culture. As an extension, the topic has also been studied across East and West populations. The review of previous fact and belief research provides a reference to the current study in terms of experimental design and research methodologies.

Culture and Cognitive Processes

Given the evident differences in Western and Eastern Asian culture, a question has risen in the field of psychology: do Western and Eastern Asian people think differently? If they do, how? This seems to be a broad question that requires evidence from a variety of disciplines in addition to psychology.

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This current study attempts to address the question from one basic psychological process which is cognition. The reason for focusing on cognition is that the research of cognition looked at a group of mental processes in which individuals obtained and utilized knowledge of objects in their environment. The investigation of cognitive processes across cultures was especially informative because it informed us about how the environment and other socio-cultural factors helped to shape, mold and transform the way people process, think, and act in the world (Mishra, 2001). The following section will provide a review of the literature looking at how cultural background affects people's most basic cognitive processes: attention and perception, categorization and reasoning/problem solving.

Since the early 1990s, the research on cognition between Eastern and Western cultures has caused rising attention in the field of psychology. Richard Nisbett has made the most prominent contribution in studying how and why East Asians and Westerners think differently. Over the past two decades, Nisbett and his colleagues have conducted a series of studies examining different cognitive processes between two distinctive cultures: East Asian and Western. In these studies, the East Asian samples were mostly young adults in or from China, Korea and Japan. The Western samples were usually young adults, white American in the United States. In their research, Nisbett and his colleagues characterized the thinking system of East Asians as "holistic" emphasizing relationships and connectedness between object and field. The researchers noted that the holistic mode thinking was developed from the traditional Chinese view, tracing back to ancient Chinese societies that emphasized harmony and wholeness; whereas, the Western thinking system was characterized as "analytic" which tended to isolate the object from the field and categorized it with respect to its properties. The researchers noted that

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the analytic mode of thinking was greatly influenced by ancient Greek culture which advocated democracy and freedom, and stresses logic and reasoning.

Perceptual Process

In the domain of perception, Witkin and his colleagues demonstrated that there were substantial individual differences in the extent to which people differentiate an object from the field in which it appears (Witkin & Berry, 1975; Witkin et al., 1954). In studying the thinking system between East Asians and Western people, Nisbett and his colleagues indicated that East Asians should be more field-dependent and people of Western cultures should be more field independent (Ji et al., 2000; Nisbett et al., 2001).

The existing literature provided some theoretical as well as empirical evidence for the notion that East Asians and Western people were different in the degree to which they separated an object from the field in which it was embedded. This notion can be explained through comparing the origin of sociocognitive systems between ancient Chinese and Greek societies. Chinese civilization was based on agriculture which promoted substantial cooperation among people. The ancient Chinese society was hierarchically organized: the King or the emperor had a great power controlling the lives of individual Chinese. Thus, economy and social order were centralized and harmony was emphasized. All those social characteristics were associated with "collectivist" or "interdependence" social orientation. In contrast, the Greek economy was not completely reliant on agriculture. The Greek ecology allowed economic activities like fishing, trading and shipping which were closer to the modern market economy. Greeks developed a sense of freedom from the politically decentralized social organization and favored public speaking and debate.

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In recent years, an increasing number of empirical studies have been done in comparing perceptual processes between East Asians and people of Western cultures (e.g., Americans) (Chalfonte & Johnson, 1996; Ji et al., 2000; Park, Nisbett, & Hedden, 1999; Yates & Curly, 1996). For example, Masuda and Nisbett (2001) presented realistic animated scenes of fish and other underwater objects to Japanese and Americans and asked them to report what they had seen. Results showed that Japanese and Americans equally mentioned the details of the fish; however Japanese made more statements (about 70% more) on the background objects indicating that Japanese attended to the object more than the Americans. In addition, a subsequent recognition task found that Japanese tended to perform lower when the fish was shown with an inappropriate background. In contrast, Americans recognition of the object was unaffected by the inappropriate background. This task demonstrated that Japanese's field-dependent cognitive style of linking the object to the field; whereas, American was field-independent so that they could detach the object from the field.

The most popular tests used in examining field dependence included the Embedded Figures Test (EFT; as cited in Ji et al., 2000) and the Rod and Frame Test (Witkin et al., 1954). In the Embedded Figure Test, a small figure was shown to participants who were then asked to find it in a larger more complicated figure. Not all studies using the EFT found significant differences between Eastern Asians and Westerners (Bagley, 1995); however, Kühnen et al. (2000) compared various Western populations with Malaysians and found Malaysians substantially more field-dependent than any of the Western groups. In the Rod and Frame Test, the participants looked into a rectangular box framing a rod that sat inside it. The task was to report when the rod appeared to be vertical. Field dependence was indicated by the degree to which judgments about the position of the rod were influenced by the position of the frame. Ji

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and her colleagues (Ji et al., 2000) found that East Asian participants made weaker judgments about the position of the rod under the influence by the position of the frame. This suggested that East Asians were less likely to detach an object from the field in which it was embedded. In other words, East Asians tended to be more field-dependent.

The hypothesis that East Asians and Westerners are different in their perception of object or field was tested in an interesting study that looks at how people from different cultures perceived people's facial emotion (Masuda et al., 2008). The researchers conducted two studies involving Japanese and American college students. In Study 1, participants were asked to view cartoons showing a happy, sad, angry, or neutral person surrounded by other people expressing the same emotion as the central person or a different one. As a result, Japanese participants were more likely to be influenced by the surrounding people than their American counterparts when they perceive the central person's facial emotion. Study 2 examined participants' eye-tracking movements and found that Japanese pay more attention to the surrounding people than did Americans. The results indicated that Japanese had a tendency of field dependence where they attached the object to the field and viewed things as a whole; whereas, Americans were inclined to separate the object from the field and viewed things piece by piece.

In recent years, industrial scientists have capitalized on research of cognitive styles to study technology-related matters. For example, Dong and Lee (2008) conducted a study comparing webpage perception of people with different cognitive styles. It was hypothesized that differences between holistic thought and analytic thought can be reflected in webpage perception. An experiment was carried out among Chinese, Korean and Americans. Participants were presented a webpage prototype in their native language. For example, Chinese participants were exposed to a Chinese version of the prototype. The experiment used the Eye Gaze

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Development System and the software EMT tracker to record eye-tracking movements. It was found that Chinese and Koreans tended to browse a webpage by scanning the entire page, that is, perceive the context and the field as whole. Americans, however, appear to focus on each piece of information one-by-one. They also appeared to pay attention to the page title and read the navigation bar while few of Chinese and Korean participants did so. The findings were consistent with what was proposed in the cross-cultural cognitive style model: holistically-minded people were more likely to be field dependent while analytically-minded people tended to be more field-independent.

Categorization Process

Given East Asians' focus on relationships and contexts versus Western people's attention to the object and its properties, the two groups were expected to organize the world differently (Nisbett et al., 2001). Research has found that Westerners organized the world into categories and use rules more than do East Asians; whereas East Asians were more inclined to organize in terms of similarities and relationships (e.g., Chiu, 1972; Choi et al., 1997; Gentner & Medina, 1998; Smith, Patalano, & Jonides, 1998; Unsworth, Sears, & Pexman, 2005). For example, in a study investigating how Chinese and American children form categories, Chiu (1972) presented items consisting of three pictures of human, vehicle, furniture, tool or food categories to the participants. Shown a picture of a man, woman and child, the Chinese children were more likely to group the woman and child together because "the mother takes care of the baby." In contrast, American children were much more likely to group the man and woman because "they are both adults." The results indicated that Chinese tended to group objects based on their relationships and the context; whereas, Americans tended to categorize objects under certain groups. Ji and Nisbett (Ji, Nisbett, & Su, 2001; Ji et al., 2000) found the same results as Chiu (1972) did with

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adult Chinese and American students. Participants were asked to describe verbally which two of three objects were most closely related. The results showed that Chinese were more likely to group objects based on some kinds of relationships, either functional (e.g., pencil and notebook) or contextual (e.g., sun and sky). In contrast, Americans were more likely to group objects on the basis of some feature shared within a category, such as notebook and magazine. Using Chiu's (1972) sorting task , Unsworth, Sears, and Pexman (2005) also found that East-Asians may group objects based on relationships as well as category membership; whereas, Americans had a stronger tendency towards using categories to organize information.

It was evident that East Asians and Western people generated categories in different ways. More recent efforts started to examine some variables that may intervene the cultural effect in categorization (Gutchess et al., 2006; Ji et al., 2004). Ji and his colleagues (2004) conducted an examination of language effects on categorization between Chinese and European Americans. In the study, the Americans participants were tested in English and the Chinese participants were tested in either English or Chinese. One hundred nineteen Chinese students participated in the study in China and 131 participated in the United States. The researchers found that regardless of language or location of testing Chinese participants grouped objects more on the basis of relationships and less on the basis of category membership than did European Americans. More importantly, the data suggested that the cultural differences between Chinese and European Americans were not an artifact of the testing language.

Research on cultural variations between Eastern and Western cultures has usually been conducted with young adults. Given this limitation, two studies were conducted to examine cultural differences in categorization in both younger and older adults (Gutchess et al., 2006). The purpose of these studies was to look at how age would interact with the cultural influence on

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categorization. Across two studies, 112 young (aged 18–22) and 112 elderly (aged 60–78) drawn from two cultures (American and Chinese) encoded words presented in their native language. The results suggested that cultural differences in categorical organization were larger for elderly adults than young adults. There was an interaction effect between culture and age on categorization.

Attribution Process

Casual attribution studies how people explain and understand the causes behind behaviors and environmental occurrences. East Asians tended to use more contextual factors in explaining person and behaviors, whereas Westerners see behavior as a product of someone's internal dispositions and would not pay too much attention to situational factors (Hong, Chiu, & Kung, 1997; Lee, Hallahan, & Herzog, 1996; Miller, 1984; Morris & Peng, 1994; Norenzayan et al., 2002). In the domain of casual attribution, a series of studies examined the East-West differences from different aspects. Some studies looked at how Eastern and Western people differ when they were asked to describe a person (self or other), which provided people an opportunity to infer what kind of causal theory of behavior they have. For example, Shweder and Bourne (1982) asked Hindu Indians and Americans to describe their acquaintances and found that Hindu Indians' descriptions were referred much to roles, social identities, and occupations which were more likely to be contextual variables. Comparatively Americans' descriptions spoke more toward personality traits which were personal variables. Miller (1984) demonstrated the same pattern when studying how people described each other. The researcher found that when explaining other people's behaviors Hindu Indians stressed contextual determinants of behavior. For example, one Hindu adult participant discussed a deviant behavior involving an agent's cheating a customer out of money paid for work. The Hindu participant explained the behavior

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by reference to the agent's socioeconomic position: "The man is unemployed. He is not in a position to give that money." In contrast, Americans emphasized dispositional characteristics. For example, an American adult discussed a deviant behavior involving an agent cheating on her income tax return. The participant explained the neighbor's behavior by reference to her personality characteristics: "That's just the type of person she is. She's very competitive."

In a self-description test, Cousins (1989) asked Japanese and American college students to describe themselves in the Twenty Statement Test (TST), in which they were asked to complete 20 statements beginning with the words "I am." Cousins (1989) found that American participants used general abstract personality traits (e.g., "I am curious." "I am sincere.") three times as often as Japanese participants did. Japanese description of self more often reflected their social identities (e.g., "I am a Keiyo student.") or referred to specific contexts (e.g., one who plays mah-jong on Friday nights). The results showed that Japanese described themselves using more contextual variables whereas Americans described themselves in a more abstract and general way. The tendency that East Asians' self- descriptions were more concrete and social than those of Americans was also found for Koreans (Rhee et al., 1995) and Chinese (Ip and Bond, 1995; Triandis , McCusker., & Hui, 1990). In these studies, the TST was used. Responses to the TST showed that East Asian participants' (either Korean or Chinese) self-descriptions were more contextualized than those of their American counterparts implying they had a more contextualized theory of behavior.

Some studies looked at the East-West differences in attribution patterns through examining how people explain a variety of behaviors. Joan Miller (1984) was one of the earliest researchers who found the direct evidence showing contextualized orientations for Asians to explain social events. In her study, the researcher contrasted social explanations of Hindu Indians

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with Americans. The participants were selected across three age groups (8–, 11–, and 15–year–old children and adults) from both cultures to explain an acquaintance's behavior that had a good outcome and another behavior that had a bad outcome. Participants' responses were content analyzed and coded as to whether they were abstract dispositional ones or contextual ones. Americans explained their acquaintances' behavior, either good or bad, predominantly in terms of corresponding traits, whereas Hindu Indians explained similar events in terms of social roles, obligations, and other context-specific factors. Contextual attributions were twice as frequent for Indians as frequent for Americans, but dispositional attributions were twice as common for Americans as for Indians. The cultural difference was larger for bad behavior than for good behavior. Miller also found that such cultural differences appear gradually through socialization. American and Indian children were much more like each other in their causal attributions than American and Indian adults. Dispositional attributions increased with age for American participants but not for Hindu Indians.

Similar East-West differences in causal attribution were found in studies conducted by Morris and his colleagues (Morris, Nisbett, & Peng, 1995; Morri & Peng, 1994). The participants were Chinese and American graduate students from the University of Michigan. The researchers presented to the participants two events that had occurred in the United States. One was about a Chinese graduate student (Lu) at a Midwestern university, angry at what he regarded as ill treatment at the hands of his advisor, shot and killed the advisor and several bystanders. The other news was about a postal worker (Mcllvane) in Detroit, angry at what he regarded as ill treatment by his supervisor, shot and killed the supervisor and several bystanders. Morris and Peng (1994) asked the participants to explain the two events. The results showed that situational factors were given greater weight overall by Chinese than American subjects in both Lu's and

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Mcllvane's murder cases. For example, Chinese participants rated significantly higher than the Americans on "Americans' extremely individualistic and selfish values" and "American movies and television glorify violent revenge tactics" as a major cause to the two murders. Comparatively, the American participants weighted significantly more on personal dispositions than the Chinese participants as the major cause in Lu's murder case. For example, they rated significantly higher on "Lu was mentally imbalanced because his life consisted only of work, without other activities which relieve stress," and "Lu drove himself crazy by putting too much pressure on himself," however, no significant difference was found between the Chinese and American participants in their rating of personal disposition factors in Mcllvane's murder case. In addition, Morris and Peng (1994) analyzed accounts of the two incidents in an English language newspaper and in a Chinese language newspaper. They found that the English newspaper focused on the mental instability and other negative dispositions of the murder as possible causes. For example, the newspaper wrote "the man was mentally unstable," "darkly disturbed man who drove himself to success and destruction," and "he had a short fuse." In contrast, the Chinese newspaper emphasized contextual, situational, and even societal factors. For example, it wrote "Lu did not get along with his advisor," "tragedy reflects the lack of religion in Chinese culture," and "followed the example of recent mass slaying in Texas."

According to the existing research in causal attribution, it is clear that East Asians and Western people would explain and understand the causes of an event in different ways. More recent research revealed a focus on the opposite side of the coin; that is, how people from different cultures are aware of the potential consequences of events. It is assumed that if cultural differences were found to affect the perceived "causes of events" they should affect the perceived "consequences of events" also. Maddux and Yuki (2006) capitalized on Eastern-

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Western cultural differences in thinking systems (i.e., holistic versus analytic) and initiated research looking at how these cultural differences would influence perceptions of the consequences of events. The researchers hypothesized that compared to Westerners East Asians may be more aware of consequences in the broader context that is relatively indirect and distally related to the focal event. The hypothesis was tested in a series of four studies. The samples across the four studies included European Americans (Caucasian), Asian Americans and Japanese. Study1 asked participants to observe a picture of a person making a shot in a game of pool and evaluate how much the shot would affect four subsequent events. In Study 2, being presented with a picture of a scene of nature, participants were told that the area on the picture had turned into a national park and they were instructed to list possible consequences that would result following the area becoming a national park. In Study 3 and Study 4, participants were asked to read a scenario with regard to a company layoff (in Study 3) and a car accident (in Study 4). Open-ended and closed-ended questions were used to assess participants' social responsibly and their affective reactions. As a result, Study 1 showed that compared to their Caucasian counterparts Asian Americans thought a single shot in a game of billiards had a broader impact on subsequent shots. In Study 2, Japanese were more likely to generate a list with indirect consequences of the event than did Americans. In Studies 3 and 4, compared to Americans, Japanese participants perceived social events as affecting a larger number of people. They also perceived themselves as more responsible for the indirect and distal consequences and felt worse about these indirect consequences.

Building on the results from Maddux and Yuki (2006), Hou and Tang (2009) conducted a research comparing responsibility attribution in Chinese and American cultures. The sample was comprised of Chinese college students in China and American college students in the U.S.

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Participants were asked to read a scenario regarding an awful break-up between a young woman and her boyfriend which resulted in a murder and respond to a set of questions that were designed to measure participants' views on responsibility. It was found that intention of the "murderer" and consequence of the event plays a big role in the Chinese's judgments about responsibility; whereas, American participants tend to attribute the "murderer" more responsibility for the results of the crime regardless of whether or not the crime was intentional or unintentional. This indicated that Chinese tended to take more contextual factors in their attribution process; whereas, Americans took fewer.

Cultural differences were not only found in evaluating causes/consequences of social events but also in understanding reasons of academic success/failure. Research found that East Asians explained their academic outcomes in a different way than their Western counterparts. Stevenson and Stigler (1992) reported that children, parents, and teachers in East Asia believed effort was a far more important determinant of children's academic achievement than ability, whereas their American counterparts believed the opposite. For example, when asked whether they agreed with the statement "The tests you take can show how much or how little natural ability you have," children in Japan and in China tended to disagree, but American children strongly agree with it. Overall, East Asians' attributions for achievement were shown to be less internal than American's attributions.

East Asians' emphasis on effort and hardworking in learning was also demonstrated by a study looking at epistemological beliefs of Hong Kong teacher education students (Chan, 2003). The study found that the Hong Kong teacher education students hold strong beliefs in effort and hard-work associated with learning; however, in terms of beliefs about learning, people in western countries especially in North America were inclined toward innate/fixed ability

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(Schommer, 1990, 1994). Chan (2003) thought the results reflected that Confucius Chinese culture placed high value on education, effort, and hard-work.

Reasoning and Dialectical Thinking Process

Psychologists have documented two different cognitive strategies that are implemented in human thinking. One strategy was associative or similarity-based in nature which reflected temporal contiguity and statistical regularities among features. This cognitive strategy was described as intuitive, experience-based. The other strategy employed symbolic representations and logical structure using rules in analyzing the world. This cognitive strategy was described as formal, rule-based (Evans & Over, 1996; Neisser, 1963; Smith, Langston, & Nisbett, 1992; Tversky & Kahneman, 1983). The two different reasoning systems have reflected the cognitive outlooks of East Asian and Western cultures. Research has documented that East Asians, who were considered to be holistic, were more likely to base reasoning on their personal experience, make categorizations based on similarity and continuity, seek the "middle-way" when confronting contradiction; whereas, people in Western cultures, who were considered to be analytic, tend to use rules, abstract representations and base reasoning on their logical thinking (Norenzayan et al., 2002).

In examining the difference between Westerners and East Asians in rule-based and experience-based thinking, Norenzayan (1999) conducted a series of studies. One study looked at the learning of categories by application of rules versus using experience-based knowledge, such as exemplar memory. Rule-based categorization referred to categorizations made based on a rule and sufficient features. For example, if someone decides that his coworker is a bachelor because he satisfies the rule "bachelor is an unmarried adult male." Exemplar-based categorization, in contrast, was based on similarity relationships between the new object and exemplars stored in

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memory that share a set of features. The more similar the new object and the retrieved exemplar were, the more likely it was that the new object and the retrieved exemplar belong to the same category. In this case, this person would not judge whether his coworker was a bachelor based on the rule that "a bachelor is an unmarried male." Instead he may think his coworker was a bachelor because his coworker matched a lot of characteristics with his relative who is bachelor.

Using a well-developed paradigm in categorization research (Allen & Brook, 1991; Patalano, Smith, Jonides, & Koeppe, 2001; Smith, Patalano, & Jonides, 1998), Norenzayan (1999) presented East Asian, Asian American, and European American students with cartoon animals on a computer screen and told them that the animals belonged to different categories, some being from Venus and some from Saturn. In order to learn to categorize the animals, some participants were trained in an exemplar memory condition where participants were asked simply to observe a series of the cartoons and initially make guesses as to which animal belonged to which category. Feedback was given after each guess. As participants repeated categorizing the same animals, they could rely on their memory of previous exemplars to assign the animals to their appropriate categories. Some participants went through a formal rule-based category learning procedure. They learned a complex rule which consisted of categorizing based on whether or not the animal had three out of five bodily features. The results showed that East Asians and European Americans performed equally well in the exemplar memory categorization condition. However in the rule condition, European Americans made fewer classification errors than East Asians.

Research has shown that the experiential thinker not only used exemplar memory but also family resemblance as a strategy for reasoning. This strategy of family resemblance referred to the categorization based on a group of exemplars. Some exemplars were believed to be more

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similar to the category than others (Rosch, 1978; Rosch & Mervids, 1975). The assumption was that if East Asian thinking was more experiential than Western thinking, then East Asians may be more tempted to rely on family resemblance and less willing to categorize objects based on a simple rule. Norenzayan (1999) conducted a study to test this assumption, examining how Westerners and East Asians classified objects and judge category similarity. Participants were undergraduate students including European Americans, Asian Americans and East Asians from a big public university. The stimuli used were similar to those used by Kemler-Nelson (as cited in Norenzayan, 1999). Each stimulus set had one abstract structure, constructed from four binary features. Each stimulus set corresponded to one item (e.g., flower), and was composed of a target object and two categories (Group 1 and Group 2), four objects were designed to belong to each category. One of the four binary features always defined or determined each category. For example, all four images of the flower had either a short or long stem. The results showed that when asked which category the target object belonged to, all participants across cultural groups made classification decisions that were most likely rule-driven. This replicated cross-culturally a well-known finding in past research with American participants, which showed that free classification was persistently made by unidimensional rules, even when a unidimensional rule conflicts with family resemblance structure (Ahn & Medin, 1992; Medin, Wattenmaker, & Hampson, 1987; Regehr & Brooks, 1993); however, when participants were given instructions to pay attention to overall similarity, cultural differences emerged. Under these instructions, European Americans tended to choose the rule category to the same degree as in the free classification condition, whereas East Asians tended to choose the family resemblance category. Asian Americans this time were in between, their preferences being equally divided between either rule category or family resemblance.

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The previous two studies conducted by Norenzayan (1999) examined the actual cognitive processes of East Asians and Westerners in ways by which they categorize and organize concepts. In order to further his investigation in cultural differences between East Asian and Westerners in their reasoning process, the researcher engaged in broader cognitive tasks in his later study examining reasoning based on logical structure and reasoning based on empirical beliefs. Early cultural psychologists (Cole, Gay, Glick, & sharp, 1971; Luria, 1976; Scribner, 1977) found that people in non-western cultures (e.g., Scribner used a sample of Uzbek farmers in the former Soviet Union, the Kpelle of West Africa, and the Maya in Mexico) tended to derive thought empirically rather than logically. Especially when using empirical beliefs and logic were in conflict, non-western people's preference of empirical beliefs became salient.

There has been a series of research in psychology looking at the extent to which one's reasoning was guided by experiential knowledge of the world or logic. According to the findings, the believability of the conclusion may interfere with logical evaluations. That was valid arguments with implausible conclusions may be mistakenly thought to be invalid, and invalid arguments with plausible conclusions may be mistakenly thought to be valid. This was known as the belief bias effect in psychology (Evans, Barston, & Pllard, 1983; Newstead, Pollard, Evans, & Allen, 1992; Revlin, Leirer, & Yop, 1980). If one favored strategy of logic, one should ignore the empirical content of the conclusion and simply make evaluations based on logical rules.

Very little research examined the bias belief effect from cultural aspects. The purpose of Norenzyan's study was to examine the bias belief effect between a Western and non-Western culture. In Norenzayan's study (1999), participants were European American students from a university in the United States and Korean students from a university in Korea. For each concrete argument presented, the participants were asked to evaluate argument validity and conclusion

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believability. Four arguments were generated for each of the four argument types: valid/believable, valid/unbelievable, invalid/believable, and invalid/unbelievable. Listed here are examples of arguments of each type.

- Valid/believable: all cold-blooded animals like water, fish are cold-blooded animals, fish like water.
- Valid/unbelievable: if a country has a warm climate, it cannot host Winter Olympic Games, Australia can host Winter Olympic Games, Australia does not have a warm climate.
- Invalid/believable: no vegetable-loving animals eat meat, some water-loving animals eat meat, some vegetable-loving animals are not water-living animals.
- Invalid/unbelievable: all flowers have petals, potatoes do not have petals, potatoes are flowers.

After participants evaluated the 16 arguments, they were asked to evaluate an additional 8 arguments having the same logical structure as the prior arguments except that they were presented in abstract form, instantiated in letters and foreign words. Thus, each participant evaluated a total of 24 arguments. A manipulation check for believability was conducted by a separate group of European Americans and Korean students. The results showed that European Americans and Koreans agreed that believable conclusions were indeed believable and unbelievable ones were indeed unbelievable indicating the believability manipulation was successful for both cultures. In comparing the ratings of European Americans and Koreans for believable and unbelievable conclusions, Koreans found believable conclusions to be significantly less believable than European Americans did, however, the ratings of European Americans and Koreans did not differ for unbelievable conclusions. The results indicated that

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Koreans had stronger belief bias than European Americans did. In comparing the ratings of European Americans and Koreans for valid and invalid arguments (abstract and concrete), Koreans were more likely to evaluate the arguments as valid when the conclusion was believable, and less likely to do so when the conclusion was unbelievable indicating that Koreans had a stronger belief bias.

Norenzayan's three cross-cultural studies compared the cognitive processes of European American, Asian American and East Asian students. In each study, a cognitive conflict was created between rule-based and experienced-based thinking. His research was guided by a central hypothesis that Westerners were more likely to use the strategy of logical reasoning; whereas, East Asians tended to categorize and organize the world based on experience. The results of the three studies supported the central hypothesis from different aspects. Studies 1 and 2 examined cognitive processes in response to perceptually driven, artificially-constructed categories. Study 1 showed that when a complex rule was in conflict with exemplar memory, European Americans made fewer classification errors in category learning than East Asians. East Asians were also slower in rule applications than European Americans, regardless of whether the rule conflicted with exemplar memory. In Study 2, participants were asked to judge similarity of the object to the category and instructed to attend to all properties of the categories. The results showed that East Asians' responses were based on family resemblance, whereas those of European Americans were based on rules. Study 3 investigated deductive reasoning. East Asians showed a stronger belief bias than European Americans, judging valid arguments with unbelievable conclusions to be less valid than valid arguments with believable conclusions. Besides the cultural differences found in those cognitive processes between European American and East Asians, this research also found that Asian Americans were either similar to European

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Americans, or intermediate between European Americans and East Asians. This finding may reflect a socialization and centralization of Asian Americans into a Western thinking mode.

In addition to research looking at two major reasoning systems (intuitive versus formal logical), a line of research aimed to explore differences between East Asians and Westerners as in terms of their dialectical thinking. Generally, dialectical thinking refers to the tendency toward acceptance of contradictions and use of contradictory facts or ideas to understand relations among objects or events (Ho, 2004; Peng & Nisbett, 1999; Peng, Spencer-Rodgers, & Nian, 2006). According to the existing literature, Chinese have been known as dialectical thinkers, to be specific, they tended to integrate apparent oppositions or embrace clashing but instructive viewpoints. They see things in a meaningful whole in which the elements are constantly changing and rearranging themselves (Peng et al., 2006). In Western tradition, however, contradiction is considered as a temporary state that will finally move to one direction-from a contradiction to a synthesis. The western model of dialectic thinking is still based on the laws of formal logic, which do not tolerate contradiction (Ho, 2004).

Peng and Nisbett (1999) conducted a research investigating cultural differences between East Asians and Westerners in dealing with contradiction. The research was comprised of five studies. Study 1 was designed to assess different preferences between Chinese and American university students for proverbs taken from Chinese culture and American culture. The study found that there were nearly four times as many dialectical proverbs in the Chinese book as in the American book, suggesting that contradiction is more likely to be stressed in Chinese than in American culture. In addition, Americans greatly preferred non-dialectical Chinese proverbs to dialectical American proverbs, and the Chinese preferred dialectical to non-dialectical Chinese proverbs. As a follow-up, Study 2 was conducted among a group of graduate students who were

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Chinese and non-Jewish Whites. Participants were presented with linguistically neutral, unfamiliar proverbs chosen from Yiddish proverbs. The results showed that Chinese preferred more dialectical Yiddish proverbs than Americans did. Study 3 looked at how people from the two cultures would resolve social contradictions. The study found that Chinese were more likely to adopt a compromising approach when dealing with social contradictions; whereas American participants' resolution tended to be non-compromising and blaming one side for the causes of the problems. Study 4 was conducted based on the assumption that Chinese people are less likely than Westerners to engage in debates and formal argumentation (e.g., Becker, 1986). The study looked at different preferences in argument forms. In other words, which were more persuasive to participants: logical argument or dialectical argument? As expected, the results indicated that American participants preferred the arguments that applied the law of non-contradiction and Chinese preferred the arguments that applied the principal of holism. Study 5 was designed to explore cultural differences in dealing with contradictory information. Participants were presented with brief descriptions of a set of findings of scientific studies which were apparently contradictory. They were instructed to indicate how much they believed each of the statements to be true. As a result, if there is an apparent contradiction between two opposing perspectives, Americans tended to believe that one must be right and other must be wrong; whereas, Chinese participants were inclined to believe that both side of a contradiction might be right, and the truth lies between the two perspectives. Altogether, the results from the five studies suggested that East Asians (e.g., Chinese) were more likely to take a "middle-way" to resolve a contradiction while Westerners' (e.g., Americans) approach reflected a linear, formal logic thinking where truth only exists on one side.

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Peng and Nisbett's work has been considered to be the pioneer in studying cultural differences in dialectic thinking; however, the research has also been criticized for its limitations in methodology (Chan, 2003; Ho, 2004). For example, Ho (2004) suggested that the proverbs and solutions presented in Peng and Nisbett's research were not equally relevant and important in both cultures. The researcher further noted that culture can be one factor that affect people's dialectical thinking, but its effect may interact with other factors, such as cognitive ability and thinking disposition. Ho (2004) conducted a set of analyses to assess the effect of cognitive ability and thinking disposition in addition to culture. Cognitive ability was measured by the short form of the Wechsler Abbreviated Scale of Intelligence (WASI) consisting of the Vocabulary (verbal measure) and Matrix Reasoning (nonverbal measure) subsets. In order to assess participants' thinking disposition, the researcher designed a questionnaire consisting of a number of intermixed subscales which examine aspects of decontextualized, differentiated, and hypothetical thinking believed to be important to rational thinking in general. Three thinking dispositions were generated: need for cognition, hypothetical thinking, and commitment to beliefs. Participants were Chinese and European Canadian university students. In contrast to expectations, results revealed no cultural differences in dialectical thinking; however, there was a relationship between cognitive ability and dialectical thinking, that is higher cognitive ability is associated with better dialectical thinking. Differences were also found in three thinking dispositions in terms of their relationship with dialectical thinking. Higher need for cognition and hypothetical thinking were associated with better dialectical reasoning, while commitment to beliefs was associated with poorer dialectical thinking skills.

This literature review provided abundant empirical evidence that differences exist between East Asians and Westerners in their basic cognitive processes: perception,

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categorization, causal attribution and reasoning; however, the researcher should be cautious and not simply conclude that East Asians and Westerners are systematically different in thinking.

First of all, most of the studies testing Eastern versus Western differences in cognitive processes were conducted in experimental situations using tests and tasks (e.g., Choi, Nisbett, & Smith, 1997; Chiu, 1972; Gutchess et al., 2006; Miller, 1984; Norenzayan, 1999; Witkin et al., 1954). For example, Witkin's Embedded Figures Test (EFT) and the Rod and Frame Test have been widely used in looking at the tendency of field dependence and field independence between the Eastern and Western populations (Bagley, 1995; Ji et al., 2000; Kühnen et al., 2000). In experimental research, researchers maintained control over all factors that may affect the results of an experiment. The use of experimental control was well represented in one of the Norenzayan's studies (1999) that examined strategies of classification between the East Asians and the Americans. In a free classification task without giving any instruction, all participants across the two cultural groups made classification decisions that were overwhelmingly rule-driven. However, when all the participants were instructed to pay attention to overall similarity, the Americans tended to choose rule-based category to the same degree as in the free classification condition; whereas, the Chinese participants tended to choose family resemblance category. Therefore, the results that were obtained in experimental situations were somehow manipulated and the generalizability of the results should be tested in different experimental environments using different tasks.

Secondly, most of the studies reviewed in this paper were investigating only certain aspects of cognition (e.g., perception) instead of people's thinking system as a whole. It was uncertain whether the cognition plays a sole role in people's thinking system. In studying the thinking system between East Asians and Westerners, Nisbett et al. (2001) suggested people pay

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attention to “cognitive content” when they are looking at “cognitive processes”. The “cognitive content” was referred by Nistbett et al. (2001) as metaphysics and epistemology. The researchers believed that metaphysics, epistemology and cognitive processes exist mutually dependent and reinforce the thinking system. Epistemology presents people’s beliefs about the nature of the world, which in turn determines the cognitive procedures that people use for solving particular problems (Hofer, 2008). For example, Westerners (e.g., Americans) believe that the knowledge is changing, unstable and complex; whereas East Asians like Chinese are more likely to view the knowledge as certain/simple and ability innate (Qian & Pan, 2002). Therefore, Westerners tend to make use of categorization and search for appropriate rules that apply to the categories; whereas, East Asians tend to classify objects based on resemblance and base their reasoning on experience.

Thirdly, how great the cultural differences can be is unclear at this point. The Western samples of population were mostly educated young adults (e.g., college or graduate students) in the United States; however, the East Asian participants could be college or graduate students studying in the United States or back in their home countries. It was expected that the East Asian participants who attended school in the United States were more likely to be influenced by Western epistemological beliefs than their counterparts back in their home countries. Thus, the East Asian samples recruited in the United States were assumed to be less radical in the Eastern culture direction. Some studies used second generation East Asian populations (i.e., East Asians who were born and grew up in the United States). The effects of acculturation made the Asian Americans think and behave more similar to the European Americans. For example, in studying the cultural differences in categorization and reasoning, Norenzayan (1999) found that the degree of differences between the Asian Americans and European Americans were lower compared

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with the degree of differences between European Americans and the Korean samples in Korea. This indicated that Asian Americans tended to use similar strategies as European Americans.

In the previous sections, the researcher have discussed limitations of current cross-cultural studies including sensitivity to the use of tests, tasks and experimental procedures, other variables that would confound culture, and frequent use of convenient samples. Being aware of these limitations, researchers have been looking for ways to maximize cultural validity in their studies (see discussion in Segall et al., 1999). Interest in every day cognition research has been burgeoning since the mid-20th century. Every day cognition research uses both psychological and anthropological approaches to allow people to display their real cognitive competence in the particular cultural milieu. It aims to capture the realities of the day-to-day psychological life of individuals. Researchers in this field study cognitive processes through observing behaviors of "ordinary people" in the context of daily life instead of on tests or tasks. Ordinary people usually refer to children and adults who had no or limited schooling. Many such observations were carried out in supermarkets, in factories, and in cocktail lounges (Rogoff & Lave, 1984).

One of the most prominent studies in the field of everyday cognition compared everyday arithmetic and school-based arithmetic (Ginsburg, 1982; Ginsburg, Posner, & Russell, 1981; Ginsburg & Russell, 1981; Nunes, Schliemann, & Carraher, 1993; Posner & Baroody, 1979; Schliemann, Carraher, & Ceci, 1997). The studies found that ordinary people (i.e., unschooled adults such as tailors and carpenters) tended to use trial-and-error methods to perform everyday arithmetic such as counting on fingers, manipulating pebbles, or using an abacus; whereas, schooled adults used school-based algorithms designed for the manipulation of symbols. The findings suggested that the unschooled adults did not make more errors than the schooled adults when performing elementary arithmetic such as breaking a problem into units, counting and

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adding concrete objects; however, the informal arithmetic skills showed their limits when dealing with more advanced arithmetic operations (addition, subtraction, multiplication, and division). Therefore, the researcher assumes that differences between ordinary people and schooled adults may occur when they deal with a situation that requires more advanced cognitive skills.

Everyday cognition is an attempt to study cognition in its sociocultural context; however, it remains relatively new. The research may overemphasize the particularities of knowledge in action (e.g., everyday arithmetic and everyday geometry). It seems that there is no strong theory that can be applied across situations.

In the field of cross-cultural psychology, we witnessed efforts to converge sociocultural theory and mainstream cognitive psychological approaches; however, as discussed previously, there were problems that made us cautious when interpreting findings, such as instrument reliability, sampling issues, cultural validity, etc.

In future research, the researcher should attempt to address those methodological issues to obtain unambiguous findings.

Review of Fact and Belief Studies

The initial research looking at how people categorize facts versus beliefs (opinions) was conducted by Rabinowitz and his colleagues (Rabinowitz, Acevedo, Casen, Kowalczyk, & Blau-Portnoy, 2011). Mitchell Rabinowitz, the first author, stated that the motivation to conduct this research came about a few years ago when he was watching the presidential debates. The author noticed that during these debates candidates frequently used phrases like “It’s a fact that . . .” “The fact is . . .” and “It’s my belief . . . .” In spite of his suspicion that whether the candidates were correct in labeling something as a fact or belief, the author thought this was rather a

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question of how individuals interpreted and used categories of facts and beliefs. In the research, Rabinowitz and his colleagues stressed that the ability to distinguish facts from beliefs (opinions) is important in our educational system as well as in our everyday life. For example, New York State Department of Education has included this topic as a curriculum in elementary school and incorporated within a variety of subject matters (NYSED, 2010; as cited in Rabinowitz et al., 2011). This ability was also considered to be crucial in our every life because people need to validate information from different sources in order to make a reasonable judgment and/or decision.

The research included five experiments, each of which presented participants with general statements about general world knowledge and statements from a specific domain (psychology, biology, history and politics). Participants were asked to answer three questions about each statement: i.e., first, on a scale of 1 (*strongly disagree*) to 4 (*strongly agree*), how strongly they agreed with the statements; second, on a 5-point scale ranged from 1 (*0%*) to 5 (*100%*), the percentage of the general adult population that would agree with the statement; finally, whether the statement was a fact or belief (opinion). From the two rating scales (you and others), the authors derived six patterns that could underlie the categorization process.

- Pattern 1: I don't agree and I don't think others will (Ratings 1 or 2 on "you" and Ratings 1 or 2 on others").
- Pattern 2: I don't agree but others might or might not(Ratings 1 or 2 on "you" and Rating 3 on "others").
- Pattern 3: I don't agree but I think others would agree(Ratings 1 or 2 on "you" and Ratings 4 or 5 on "others").

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- Pattern 4: I agree but I don't think others will agree(Ratings 3 or 4 on "you" and Ratings 1 or 2 on "others").
- Pattern 5: I agree but others might or might not(Ratings 3 or 4 on "you" and Rating 3 on "others").
- Pattern 6: I agree and I think others will(Rating 3 or 4 on "you" and Ratings 4 or 5 on "others").

Based on the six pre-assumed patterns, Rabinowitz and his colleagues (2011) developed four possible models that might represent the relation between facts and beliefs. The first model is labeled "distinct features." Within this model, it was expected that facts would be exclusively represented by Pattern 6 and beliefs by Pattern 1 through Pattern 5; that is, if a statement was something that you agreed with and you expected others to agree with, it would be considered a fact and other statements would be considered beliefs. The second model is labeled "belief creep." Within this model, facts are expected to be represented exclusively by Pattern 6; however, beliefs could be represented by Pattern 1 through 6; a belief could also be something you agreed with and expected others would agree with. The third model is labeled "facts creep." Within this model, facts are represented by Pattern 5 and Pattern 6; that is, in addition to Pattern 6 a fact might be something that you would agree with but you might expect others may or may not agree with. The fourth model is labeled "feature overlap." In this model, facts could be represented by a variety of patterns, similar to those representing beliefs. This model indicated that fact and belief may be two overlapping concepts.

The research found that in the context of general statements participants in all five experiments demonstrated a belief bias, a higher percentage of statements categorized as facts than beliefs. However, across content areas (psychology, biology, history and politics) there was

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variability as to whether the topics were seen as being primarily fact laden or belief laden. For example, statements in the content of biology were more likely to be considered factual; whereas, the information about political issues were seen as being primarily beliefs. In addition, the results showed that in the context of general statements participants in all five experiments agreed as to which statements were considered to be facts versus beliefs. Across five content areas, consensus was only found in the political domain where practically everyone thought that the statements were beliefs.

Most importantly, Rabinowitz and his colleagues (2011) revealed patterns of categorizing facts and beliefs in their research. In the context of general statements, the researchers found that facts were primarily represented by Pattern 6 while all the patterns were used for beliefs. This was consistent with the "belief-creep" model in their hypotheses. In three academic subject areas (i.e., psychology, biology, history), the findings supported the "fact-creep" model where facts were represented by Pattern 5 in addition to Pattern 6. For political statements and the statements about Better Bottle Bill, the pattern of facts was similar to that in academic subject areas where Pattern 5 in addition to Pattern 6 were primarily used. However, it was interesting to find the increased use of Pattern 1, 2, and 3 to categorize facts in this content. This indicated that for political statements and the statements about Better Bottle Bill, a higher percentage of fact statements were defined as something I don't agree with but expect others may or may not agree with.

In general, Rabinowitz et al.'s research demonstrated that people were able to distinguish facts from beliefs; however, patterns of categorizing facts and beliefs varied across different domains.

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An extensive line of research regarding this topic has been conducted across Eastern and Western cultures. Feng and Rabinowtiz (2007) conducted a study between 19 Chinese college students in Southwest China and 29 American college students in New York to investigate whether culture would affect the way how people categorize facts and opinions. In this study, participants were asked to answer the same three questions as in the previous fact and belief research (Rabinowitz et al., 2011). The stimulus material included the same 20 general statements as in the previous fact and belief research and a total of 54 statements taken from four articles in a Chinese newspaper (*People's Daily*) and an American newspaper (*The New York Times*). The four articles were regarding two topics: The relations between Taiwan and Mainland China and the 2004 U.S. presidential election. Although the study found a tendency that for news article statements Chinese participants were more likely to agree on which were facts and which were opinions than their American counterparts, there was no significant effect of culture on categorization of facts and opinions.

In another cross-cultural study conducted by Li and Rabinowitz (2012), a sample of Chinese college students from southeastern China were given the same categorization task with the 20 general statements. With that sample, on the average, 59.1% of the statements were categorized as facts. The related American sample, however, demonstrated a belief bias. The researchers also asked participants to categorize a set of statements about learning strategies. With those statements, the American sample categorized 72.4% as beliefs; the Chinese sample categorized 51.4% as facts. The results indicated that Chinese participants were less strict in labeling something as a fact.

It was interesting to note that in Li and Rabinowitz's study (2012) the Chinese sample presented a fact bias in categorization while Feng and Rabinowitz (2007) did not find any

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cultural differences in their study where both Chinese and American participants showed a belief bias. The mixed results generated by two different cross-cultural studies were not unexpected. First of all, sample sizes and experiment procedures may affect the results. For example, Feng and Rabinowitz's study was conducted with a very small sample where only 19 Chinese participated; whereas, Li and Rabinowitz had a significant larger sample that included 115 Chinese students. In terms of experiment procedure, Feng and Rabinowitz sent the stimulus materials to the Chinese participants through an email attachment. Therefore, participants answered the questions anywhere and anytime they liked. In Li and Rabinowitz's study, the Chinese participants finished the questionnaire in class within a period of time. The environment in which the experiment was administered may affect participants' psychological state such as feeling anxiety and motivation to complete the questionnaires. Second, limitations of cross-cultural studies were expected. As noted by Matsumoto and Yoo (2006), culture is a multidimensional construct. Within a culture, variability exists on the ecological level and individual level. For example, on the ecological level there were many relevant noncultural factors that may affect the between-group differences such as socioeconomic status, population density, religious practices and climate (Georgas & Berry, 1995; Georgas, Van de Vigjverm, & Berry, 2004). Moreover, group differences can also be attributed to the noncultural demographic variables on the individual level. This is a caveat when attributing group differences to a culture source. Comparing the Chinese sample of Li and Rabinowitz' study with that of Feng and Rabinowitz's study, the researcher found that Li and Rabinowitz sampled the participants in southeast China while Feng and Rabinowitz's participants were from southwest China. In addition, the two universities from which the participants were recruited vary in terms of

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reputation. It is easy to believe that there was some variation between samples because of the school they attended.

In summary, the previous fact and belief research indicates that people are able to distinguish facts from belief (opinions). It is found that patterns of categorizing facts and beliefs vary across domains. For example, people tend to classify more statements as facts in a content area where theories are usually scientifically approved (e.g., psychology and biology) than in a content area which usually raises controversies and arguments (e.g., politics) (Rabinowitz et al., 2011). The research also shows that culture has an effect on patterns of categorizing facts and beliefs (Li & Rabinowitz, 2012). That is Chinese are more likely to consider a statement as a fact showing a fact-bias; whereas, Americans tended to categorize a statement as a belief (opinion) demonstrating a belief-bias.

It is important to note that in this research Rabinowtiz and his colleagues (2011) have developed a model of categorizing facts and beliefs in which six patterns are generated based on responses from two rating scales, i.e., how strongly you agree with the statement and how many other people would agree with the statement. The current study has applied the model in the analyses.

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CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Participants

The sample consisted of 71 Chinese and 72 American undergraduate students. The Chinese participants were recruited in a national research university in Chengdu, the capital city of Sichuan province in China. A total of 90 undergraduate students from the department of computer science and engineering participated in the study, of which 71 completed the questionnaire. The response rate was 78.9%. There were 32 female and 39 male participants. The age of participants ranged from 18 to 24, the average was 20.8. The American participants were recruited from a national research university in New York in the United States. An email invitation was sent out to 391 undergraduate students at the university who enrolled in the fall semester of the 2010–2011 academic year. The link to the questionnaire was embedded in the email. A total of 72 students completed the questionnaire. The participation rate was 18.4%. The American sample consisted of 53 females and 19 males. Their age ranged from 18 to 45, with an average of 20.1 years. Seventy of 72 participants (97.2%) in the American sample identified themselves as United State citizens, of which 48 were White (including Middle Eastern), 10 (14.3%) were Hispanic or Latino, 6 (8.6%) were Asian, 4 (5.7%) were African American, and 2 were bi-racial. The American sample also included two international students, one was from Britain, and the other was from The Philippines. The U.S. participants also reported their concentration of study at school. The self-reported responses were categorized into nine major areas. Table 1 shows Frequency of participants by concentration areas. As can be seen, a larger percentage of participants were studying courses in the area of social studies.

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Table 1

Frequency of American Participants by Major

Major	*f*	*%*
Social studies(e.g., psychology)	23	31.9
Science (e.g., biology)	12	16.7
Business (e.g., marketing)	10	13.9
English	6	8.3
N/A	6	8.3
History	5	6.9
Arts (e.g., dance)	3	4.2
Math	3	4.2
Engineering (e.g., architecture)	2	2.8
Language (e.g., French literature)	2	2.8

Materials and Procedure

The questionnaire contained three sections. The first section collected participants' demographic information, i.e., sex, age, nationality/ethnicity. The second section presented 20 statements of general knowledge (e.g., the earth is round.) The statements were chosen to represent a continuum of statements that would be more or less fact-like. The attempt was to present 10 statements that were thought to be facts and 10 that were thought to be opinions. The statements were presented in random order. For each statement, the participant was asked to complete three tasks: (a) rate how strongly you agree with the statement on a 4-point scale ranged from 1 (*strongly disagree*) to 4 (*strongly agree*); (b) estimate the percentage of other

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people who would agree with the statement on a 5-point scale ranged from 1 (*0%*) to 5 (*100%*); and (c) decide whether the statement is a fact or an opinion. The third section presented four articles: two from *The New York Times* and two from *China Daily*, a Chinese newspaper published in English. The selected articles were related to two topics: Shanghai students' high performance on Program for International Student Assessment (PISA) exams and the rising of Chinese currency. Following each article, there were 10 statements for which the participant was asked to complete the same three tasks as presented in the second section.

The questionnaire was translated into Chinese for the Chinese participants. The following presents the procedure of how the researcher finalized the Chinese version of the questionnaire. First, the researcher, a native Chinese speaker translated the questionnaire into Chinese by herself. Then she presented the translated questionnaire to one of her colleagues who is also a native Chinese speaker and asked him to translate it back to English without seeing the original English questionnaire. After completion, the researcher compared the English questionnaire translated by her colleague to the original one. The differences between the translated English version and the original one were noted. The researcher investigated the differences and revised the Chinese version accordingly in order to increase the accuracy of the Chinese translation.

Because the Chinese sample was ethnically homogenous, the Chinese version of the questionnaire did not include the question asking for the participants' race/ethnicity.

Both the English and Chinese version of the questionnaire was administered through SurveyMonkey, an online survey service. As mentioned earlier, the American participants were sent an email invitation in which a link to the survey was embedded. The participants were able to work on the questionnaire anytime anywhere as they liked. Any participant who completed the questionnaire was offered an opportunity to win one of the two iPod Touches. They could email

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the researcher their email contact information for entering the drawing of an iPod Touch. At the Chinese site, the study was announced at a student gathering. After the announcement, the link to the questionnaire was sent to the students through QQ messenger, the largest instant messaging service in China. The students were asked to work on the questionnaire in their dormitories. All the responses were received within two hours. Since the students were participating in a group in a certain period of time, there might be some interactions between the students. Any participant who completed the questionnaire received ¥50 (around $8) as an incentive.

The research protocol was reviewed and approved by the Institutional Review Board (IRB) at Fordham University. The IRB Report of Action with approval for the Protocol for Human Subject Research is attached in the Appendix.

Data Analysis

The first set of analyses was conducted to examine whether culture, newspaper type or news article topic would affect categorization. For this purpose, the researcher first collapsed statements across two newspapers (*The New York Times* and *China Daily*) and computed the percentage of statements categorized as facts. A 2 × 2 (Newspaper type [*The New York Times*, *China Daily*] × Culture [Chinese, American]) repeated measure ANOVA was performed to investigate the effect of newspaper type and culture on categorization. Second, the researcher collapsed statements across two news article topics (PISA scores and Chinese currency) and again computed the percentage of statements categorized as facts. A 2 × 2 (New article topic [PISA scores, Chinese currency] × Culture [Chinese, American]) repeated measure ANOVA was performed to examine the effect of news article topic and culture on categorization.

The second set of analyses was conducted to investigate whether there was consensus as to which were facts and which were opinions. For this purpose, the choices for each statement

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were coded with a value of 0 for an opinion and 1 for a fact. If everyone agreed that a statement was an opinion, that statement had a mean score of 0; if everyone agreed that a statement was a fact, that statement had a mean score of 1. If half the participants said the statement was an opinion and the other half said it was a fact, the statement was expected to have an average score of .5. The purpose of the procedure was to understand which statements were categorized as facts and which were categorized as opinions.

To statistically evaluate whether there was consensus or not, the average consensus values for each statement was converted to a scale that ranged from 0 to .40. This was accomplished by giving a value for how far away from agreement (0 or 1) a statement was. The number of statements that had an average value either between 0 and .09 or between .90 and 1 was assigned the value of 0. The number of statements that had an average value between .10 and .19 or between .80 and .89 was assigned the value of .10. The number of statements that had an average value between .20 and .29 or between .70 and .79 was assigned the value of .20. The number of statements that had an average value between .30 and .39 or between .60 and .69 was assigned the value of .30. The number of statements that had an average value between .40 and .49 or between .50 and .59 was assigned the value of .40. If there was perfect consensus the new average consensus value would equal 0.

The consensus analysis was conducted with each culture group in the context of general statements and in the context of news article statements, respectively. As for news article statements, the researcher collapsed statements across newspaper types (*The New York Times* and *China Daily*) and looked at the consensus by newspaper type. Then the researcher collapsed statements across news article topics (PISA scores and Chinese currency) and looked at the consensus by news article topic.

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The third set of analyses was conducted to examine how people define a fact and an opinion based on the six pre-assumed patterns. The six patterns represent conditions where (a) you disagree with the statement, others disagree; (b) you disagree with the statement, others vary; (c) you disagree with the statement, others agree; (d) you agree with the statement, others disagree; (e) you agree with the statement, others vary; and (f) you agree with the statement, others agree.

The study hypothesized in the context of news article statements a fact was characterized dominantly by both Pattern 5 and Pattern 6. In order to test whether the use of Pattern 5 and Pattern 6 would differ in different cultural group, the researcher collapsed all news article statements and computed the percentage of statements categorized as facts. A 2 × 2 (Pattern [Pattern 5, Pattern 6], Culture [Chinese, American]) repeated measure ANOVA was performed to look at the pattern use for all news article statements as whole. Then the same procedure was conducted for statements from each individual news article. Also, the study hypothesized in the context of news article statements an opinion was represented by a combination of different patterns. In looking at patterns used to define an opinion, the researcher combined the opinion statements represented by Pattern 1, Pattern 2, and Pattern 3. Because these three patterns included the choices of "I disagree," the researcher labeled the combination as "disagreement." The researcher also combined the opinion statements represented by Pattern 4, Pattern 5, and Pattern 6 which included the choices of "I agree." Therefore, the researcher labeled this combination as "agreement." A 2 × 2 (Pattern combination [disagreement, agreement], Culture [Chinese, American]) repeated measure ANOVA was performed across all news article statements categorized as opinions. The same procedure was also conducted with statements from each individual news article. Analyses of the variables were conducted in SPSS version 18.

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CHAPTER IV

RESULTS

Categorizing Facts Versus Opinions

General Analysis of General Statements

The first goal of the study was to see whether participants distinguish facts from opinions. For the purpose of the study, the researcher started with the 20 general statements looking at how participants categorize facts versus opinions. The percentage of statements that a participant categorized as a fact or opinion for each cultural group was calculated. Chinese participants categorized 44.3% of the general knowledge statements as facts and 55.7% as opinions; American participants categorized 46.2% as facts and 53.8% as opinions. Even though the general statements were selected with the assumption of the researcher that 50% would be considered facts and 50% would be considered opinions, participants in both cultures appeared to have a more restrictive view of what was a fact and demonstrated what might be called an opinion bias.

A one-way ANOVA was performed to compare the percentage of statements categorized as opinions between Chinese and American group. The analysis found that the effect of culture was not statistically significant, $F(1, 141) = 0.83$, $p = .363$, $\eta^2 = .01$, indicating there was no cultural difference in terms of the percentage of statements categorized as opinions.

Furthermore, the researcher conducted an item analysis to look into which statements were more likely to be categorized as opinions in each cultural group. For each statement, this analysis calculated the average percentage of participants who categorized the statement as an opinion. Table 2 and Table 3 display the percentage of participants for each statement that was

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categorized as an opinion for Chinese and American samples, respectively. The results were presented in a descending order of percentage of participants.

As shown in Table 3, American participants demonstrated a very strong opinion-bias on 10 of 20 general statements; those 10 statements were categorized as an opinion by an overwhelmingly high percentage of American participants, from 97.2–100%. Similarly, the Chinese participants presented an opinion bias toward the same 10 statements also (see Table 2); however, compared to the American group the likelihood of rating those 10 statements as an opinion appeared to be less among Chinese participants, the percentage ranged from 66.2% to 91.5%. The following presents the top 10 general statements that were rated as an opinion by the majority of Chinese and American participants:

- Christmas is a holiday primarily for children.
- Sleeping with the windows open is good for you.
- Cats are friendly animals.
- Rock music has a bad influence on young people.
- It is okay to lie.
- Comic strips are funny.
- Rich people are happy people.
- The telephone is the greatest invention of all time.
- The longer you stay in school the smarter you will become.
- Children are happy and care-free.

In addition, there were three statements consisting of the researcher's special interest. They were: Item 12 (Books may be borrowed from the library.), Item 1 (A hammer is a tool used to pound nails.) and Item 7 (Cars require fuel in order to run.) It was interesting to see that

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Chinese and American participants ran counter in terms of their ratings on those three statements. For example, 77.5% of the Chinese participants (in comparing with 6.9% of the American participants) considered Item 12 as an opinion. In other words, Chinese participants demonstrated a strong opinion-bias on Item 12; whereas, American participants showed a strong fact bias on this item. The similar pattern between the two cultural groups was also found with Item 1 (A hammer is a tool used to pound nails.) and Item 7 (Cars require fuel in order to run.): 60.6 % of Chinese participants (in comparing with 11.1% of American participants) rated item *1* as an opinion and 52.1% of Chinese participants (in comparing with 16.7 % of American participants) rated Item 7 as an opinion. The results suggested that the three statements were more likely to be considered as opinions among Chinese participants; however, they tended to be categorized as facts among American participants.

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Table 2

Percentage of Chinese Participants for Each Statement Categorized as an Opinion

Item No.	*Description*	*%*
8	Christmas is a holiday primarily for children.	91.5
3	Rich people are happy people.	90.1
15	Rock music has a bad influence on young people.	88.7
17	The longer you stay in school the smarter you will become.	85.9
2	Children are happy and care-free.	77.5
12	Books may be borrowed from the library.	77.5
19	Comic strips are funny.	77.5
13	Cats are friendly animals.	70.4
5	The telephone is the greatest invention of all time.	69.0
9	Sleeping with the windows open is good for you.	66.2
16	It is okay to lie.	66.2
1	A hammer is a tool used to pound nails.	60.6
7	Cars require fuel in order to run.	52.1
20	The shape of a ball is round.	33.8
4	A pen is used for writing.	32.4
10	Thermometers are used to record temperature.	26.8
18	There are four seasons in the year.	18.3
11	A driver's license is required by law for driving a car.	12.7
14	Dogs are animals.	
6	There are three colors on the American flag/there are two colors on the Chinese flag	11.3 5.6

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Table 3

Percentage of American Participants for Each Statement Categorized as an Opinion

Item No.	*Description*	*%*
8	Christmas is a holiday primarily for children.	100
9	Sleeping with the windows open is good for you.	100
13	Cats are friendly animals.	100
15	Rock music has a bad influence on young people.	100
16	It is okay to lie.	100
19	Comic strips are funny.	100
3	Rich people are happy people.	98.6
5	The telephone is the greatest invention of all time.	98.6
17	The longer you stay in school the smarter you will become.	98.6
2	Children are happy and care-free.	97.2
7	Cars require fuel in order to run.	16.7
20	The shape of a ball is round.	15.3
1	A hammer is a tool used to pound nails.	11.1
18	There are four seasons in the year.	11.1
4	A pen is used for writing.	6.9
12	Books may be borrowed from the library	6.9
6	There are three colors on the American flag/there are three colors on the Chinese flag.	5.6
10	Thermometers are used to record temperature.	4.2
11	A driver's license is required by law for driving a car.	4.2
14	Dogs are animals.	1.4

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General Analysis of Newspaper Article Statements

A further analysis of how participants distinguish facts from opinions was conducted for the statements taken from newspaper articles. The researcher computed the average percentage of statements categorized as facts and opinions for each newspaper type (see Table 4). Generally speaking, both Chinese and American groups presented an opinion bias toward the newspaper articles statements. It is worthy to note that for statements taken from *The New York Times* there was not a big difference between Chinese and American participants in terms of the percentage of statements were categorized as opinions; however, in the China Daily articles, Chinese categorized almost half the statements as facts and half as opinions while their American counterparts categorized a higher percentage of statements (68.3%) as opinions. This suggested that statements taken from China Daily, American participants showed a stronger opinion bias than Chinese.

In order to assess whether culture (i.e., Chinese vs. American) and newspaper type (i.e., *The New York Times* vs. *China Daily*) had an effect on categorization, a 2 × 2 repeated measure ANOVA was performed with *The New York Times* and *China Daily* being the two levels of the within-subject factor and culture being a between-subject variable. To be specific, the researcher was looking at the percentage of statements categorized as facts as to how it varied between culture and across newspaper types. The means relevant to this analysis are presented in table 4. This analysis found that the main effect of newspaper type was significant, $F(1, 141) = 21.87$, $p = .000$, $\eta^2_p = .13$, indicating that there was a significant difference between *The New York Times* and *China Daily* in terms of the percentage of facts that were generated; The main effect of culture was also significant, $F(1, 141) = 6.23$, $p = .014$, $\eta^2_p = .04$, implying that Chinese and American group were different in terms of the percentage of facts

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that they categorized. There was a significant interaction effect between newspaper type and culture, $F(1, 141) = 54.17$, $p = .000$, $\eta^2_p = .28$. This suggested that the difference between Chinese and American participants in the percentage of facts varied between *The New York Times* and *China Daily*. Two independent sample *t* tests were conducted to compare the cultural difference for *The New York Times* statements and *China Daily* statements respectively. For *The New York Times* statements, the difference between the Chinese group ($M = .46$, $SD = 0.24$) and American group ($M = .48$, $SD = 0.16$) was not significant, $t(1, 141) = -0.53$, $p = .595$; For *China Daily* statements, the difference between the Chinese group ($M = .50$, $SD = 0.26$) and American group ($M = .32$, $SD = 0.16$) was significant, $t(1, 141) = 4.94$, $p = .000$, indicating that Chinese participants categorized a higher percentage as facts than their American counterparts in the China Daily articles.

In addition, responses to news articles were collapsed by the topic of the articles (i.e., PISA scores vs. Chinese currency). A 2 × 2 repeated measure ANOVA was performed to investigate whether culture and the topic of the articles had an effect on categorization of a fact. The analysis was conducted with the PISA article and the Chinese currency article being the two levels of the within-subject factor and culture being a between-subject variable. The means relevant to this analysis are presented in Table 5. This analysis found that the main effect of topic was not significant, $F(1, 141) = 0.16$, $p = .689$, $\eta^2_p = .00$, however, the main effect of culture was significant, $F(1, 141) = 6.23$, $p = .014$, $\eta^2_p = .04$, indicating that there was a significant difference between the two cultural group in terms of the percentage of facts that were categorized. The analysis also found an interaction effect between topic and culture, $F(1, 141) = 17.80$, $p = .000$, $\eta^2_p = .11$, this suggested that the difference between Chinese and American participants in the percentage of facts varied between the PISA articles and Chinese

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currency articles. Two independent sample *t* tests were conducted to compare the cultural difference for PISA article statements and Chinese currency statements respectively. For PISA article statements, the difference between the Chinese group (M = .52, SD = 0.24) and American group (M = .37, SD = 0.15) was significant, $t(1, 141) = 4.40$, p = .000, indicating that Chinese participants categorized a higher percentage of facts than their American counterparts in the PISA articles. For Chinese currency statements, the difference between the Chinese group (M = .44, SD = 0.28) and American group (M = .43, SD = 0.17) was not significant, $t(1,141) = 0.34$, p = .733, suggesting that there was no significant difference between the two cultural group in terms of the percentage of facts that was generated in the Chinese currency articles.

Consensus Analysis

Consensus Analysis of General Statements

The second goal of the study was to assess whether participants agreed with each other as to which statements were facts and which were opinions. To assess this, a value of 1 was given if the statement was categorized as a fact and a value of 0 was given if it was categorized as an opinion. If all participants categorized a statement as a fact, the statement would have an average value of 1. If all participants categorized a statement as an opinion, it would have an average value of 0. If half of the participants categorized a statement as a fact and the other half categorized it as an opinion it would have an average value of .50, which indicated that there was no consensus among participants. Figure 1 and Figure 2 display the number of statements within given ranges of the consensus scores for the general statements for Chinese and American. As can be seen, for American participants most of the general statements had an average consensus score in the range of .00–.09 (n = 10) and the range of .90–1.00 (n = 6); whereas, for Chinese participants, average consensus scores for the general statements vary across the ranges. The

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results implied that American participants tended to agree with each other as to which were facts and which were opinions while little agreement was demonstrated among Chinese participants.

To statistically evaluate whether there was consensus or not, the average consensus values for each statement was converted to a scale that ranged from 0 to .40. This was accomplished by giving a value for how far away from agreement (0 or 1) a statement was. The number of statements that had an average value either between .00 and .09 or between .90 and 1.00 was assigned the value of 0. The number of statements that had an average value between .10 and .19 or between .80 and .89 was assigned the value of .10. The number of statements that had an average value between .20 and .29 or between .70 and .79 was assigned the value of .20. The number of statements that had an average value between .30 and .39 or between .60 and .69 was assigned the value of .30. The number of statements that had an average value between .40 and .49 or between .50 and .59 was assigned the value of .40. If there were perfect consensus among all participants for all 20 general statements the new average consensus value would equal 0.

To assess whether there was consensus or not, the consensus value was compared to the expected value of .20 (the expected value if decisions were made by chance or randomly). If the consensus was significantly less than .20, the researcher asserted that there was consensus as to which statements were considered to be facts and which were opinions. The number of statements within given ranges of consensus scores for the general statements is presented in Figure 1 and Figure 2 for Chinese and American participants respectively. The converted consensus values for the Chinese and American sample were .20 and .02 respectively. One sample *t* test was performed for each cultural group to assess whether the converted consensus value was significantly less than the expected value of 0.20. The results showed that for the

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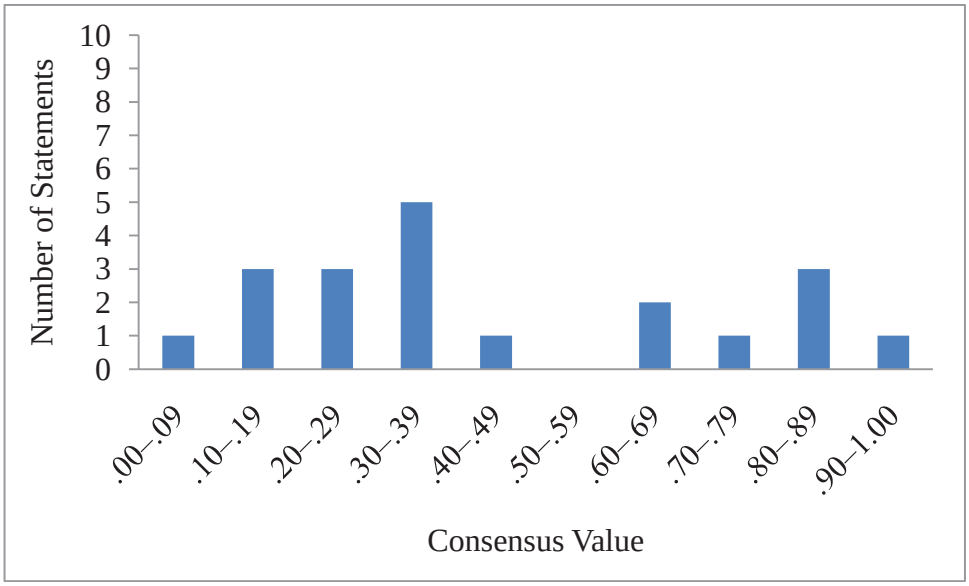
general statements American participants agreed as to which statements were facts versus opinions, $t(19) = -19.62$, $p = .00$. No consensus was found among Chinese participants $t(19) = -0.20$, $p = .85$.

Figure 1

Number of Statements as a Function of Average Consensus Value for General Statements for Chinese Participants



Consensus Analysis of Newspaper Article Statements by Newspaper Type

In order to examine whether there was consensus in newspaper article statements, the statements were collapsed by newspaper type. Figure 3 and Figure 4 display the number of statements within given ranges of the consensus scores for *The New York Times* for the Chinese and American participants respectively. Figure 5 and Figure 6 display the number of statements within given ranges of the consensus scores for *China Daily* articles for the Chinese and American participants respectively. The average consensus values for each statement were converted to a scale that ranged from .00 to .40. The converted consensus value was compared to the expected value of .20 to statistically assess whether there was consensus or not for those

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statements from *The New York Times* and *China Daily*. For *The New York Times* articles, the converted consensus value for Chinese was .34. The one-sample *t* test suggested that the converted consensus value was greater than .20, $t(19) = 7.43$, $p = 0.00$, indicating there was no consensus among Chinese participants. The converted consensus value for American participants was 0.18, which was not significantly less than .20, $t(19) = -1.31$, $p = 0.20$, indicating no consensus was found among American participants. For *China Daily* articles, the converted consensus values for Chinese was .32 which was greater than .20, $t(19) = 7.71$, $p = .00$, indicating there was no consensus among Chinese participants. The converted consensus values for American participants was .15, $t(19) = -1.88$, $p = .08$, again indicating no consensus because the converted consensus value was not significantly less than the expected value of .20.

Figure 2

Number of Statements as a Function of Average Consensus Value for General Statements for American Participants

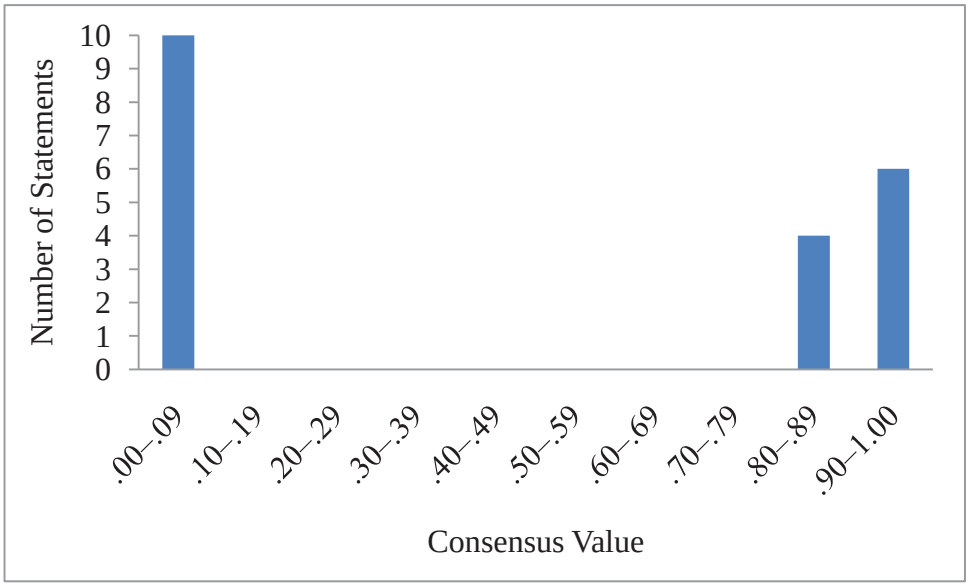

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Figure 3

Number of Statements as a Function of Average Consensus Value for The New York Times Statements for Chinese Participants

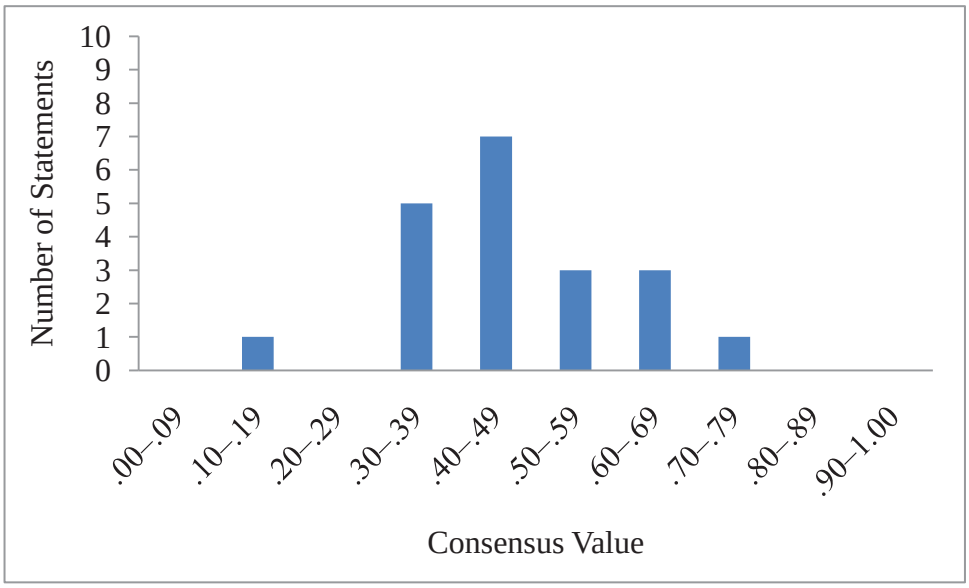

Figure 4

Number of Statements as a Function of Average Consensus Value for The New York Times Statements for American Participants

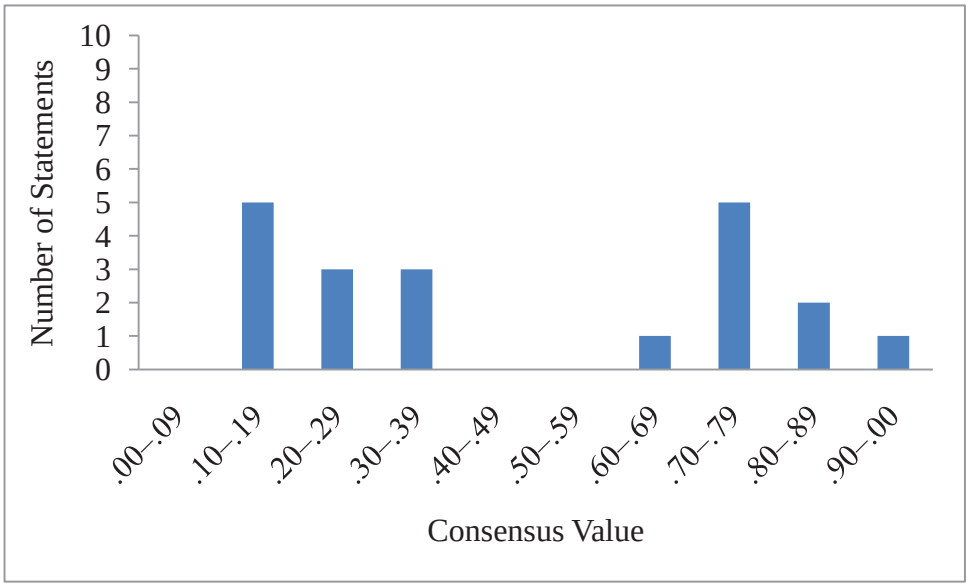

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Figure 5

Number of Statements as a Function of Average Consensus Value for China Daily Statements for Chinese Participants

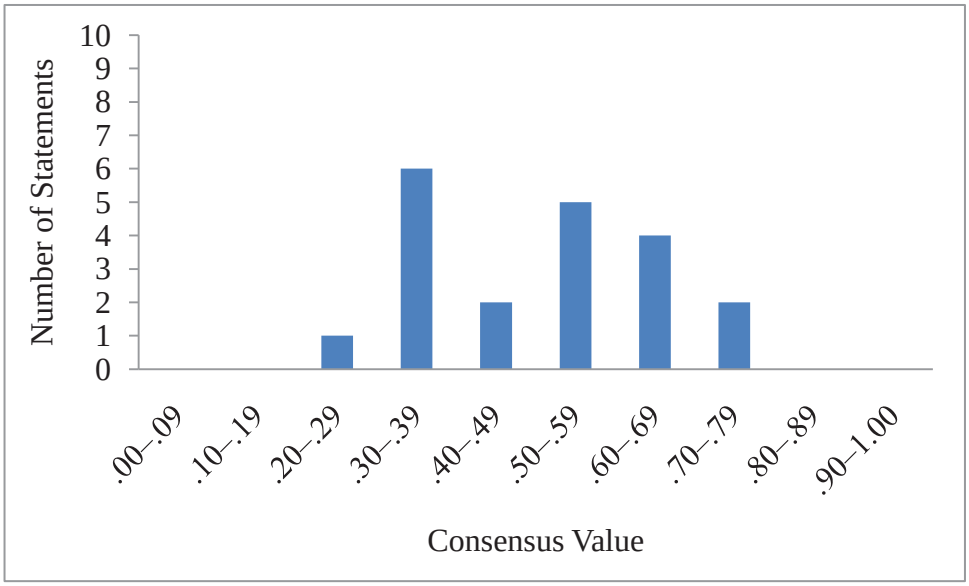
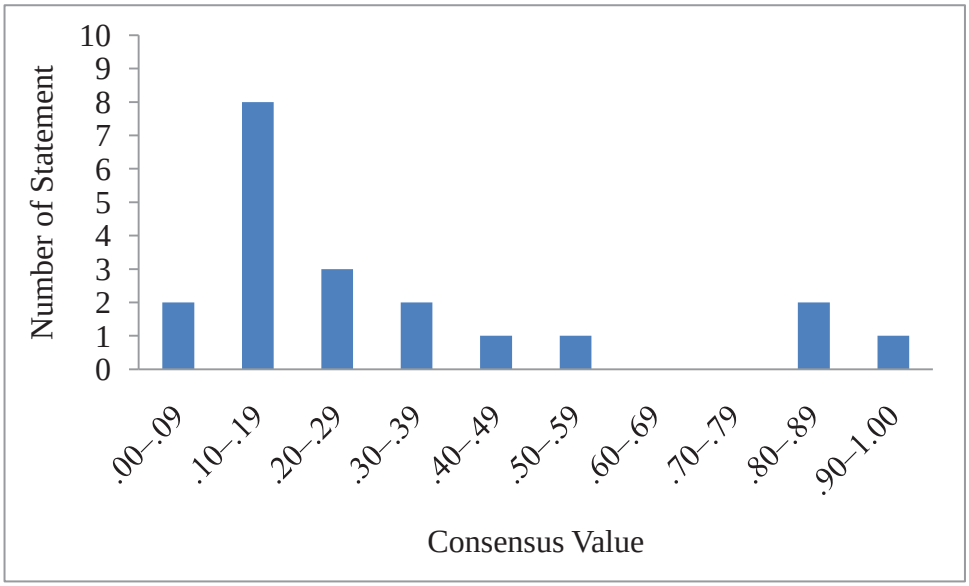


Figure 6

Number of Statements as a function of Average Consensus Value for China Daily Statements for American Participants



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Consensus Analysis of Newspaper Article Statements by Topic

Collapsing the newspaper article statements by topic, for the PISA article, the converted consensus values for Chinese was .30, which was greater than .20, $t(19) = 5.63$, $p = .00$; for Americans the converted consensus value was 0.18, which was not significantly less than .20, $t(19) = -0.96$, $p = 0.35$. This indicated that there was no agreement among either Chinese or American participants for the PISA article statements. For the Chinese currency article, the converted consensus values for Chinese was .36, which was greater than .20, $t(19) = 11.46$, $p = .00$; and the converted consensus value for Americans was and .15, which was significantly less than .20, $t(19) = -2.52$, $p = .02$. This indicated that the American participants appear to agree as to which were facts versus opinions for the article statements regarding Chinese currency while no consensus was found among their Chinese counterparts. Figure 7 and Figure 8 display the number of statements within given ranges of the consensus scores for the PISA articles for Chinese and American participants respectively. Figure 9 and Figure 10 display the number of statements within given ranges of the consensus scores for the Chinese currency articles for Chinese and American participants respectively.

In summary, no consensus was found among the Chinese participants as to which were facts and which were opinions across the general statements as well as the newspaper article statements. However, within American participants there was agreement across the general statements and the Chinese currency article statement as to which were facts and which were opinions.

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Figure 7

Number of Statements as a Function of Average Consensus Value for PISA articles for Chinese Participants

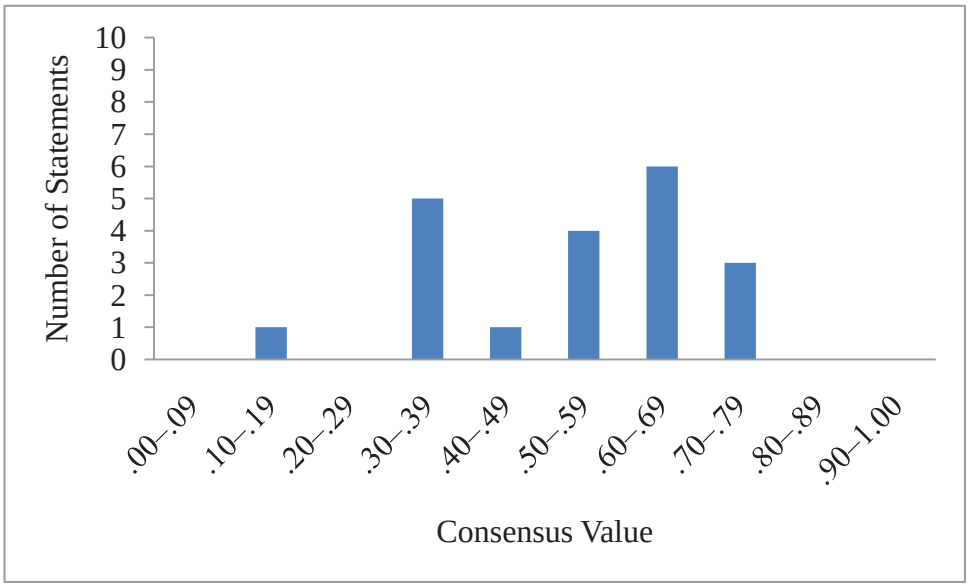

Figure 8

Number of Statements as a Function of Average Consensus Value for PISA articles for American Participants

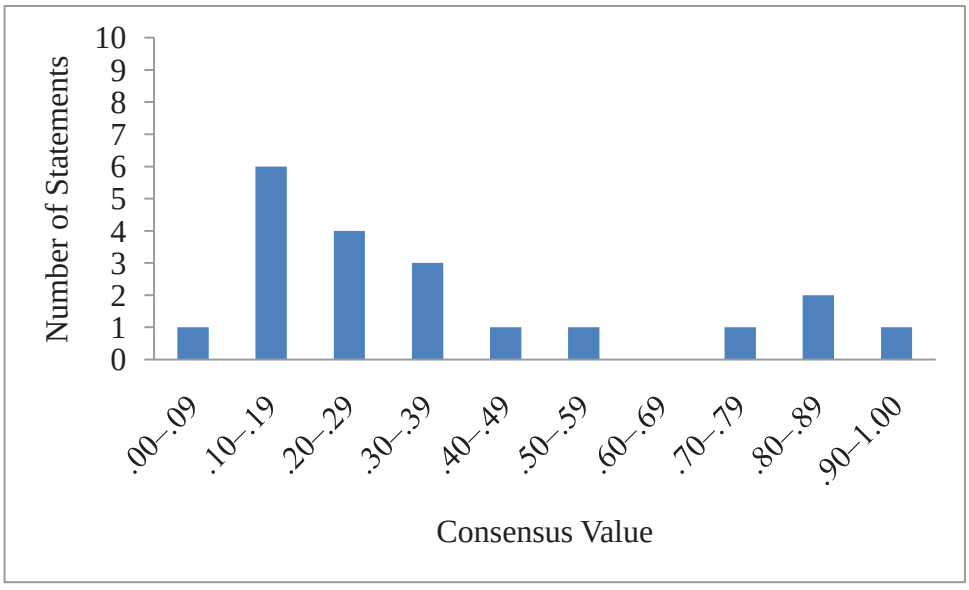

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Figure 9

Number of Statements as a Function of Average Consensus Value for Chinese Currency Articles for Chinese Participants

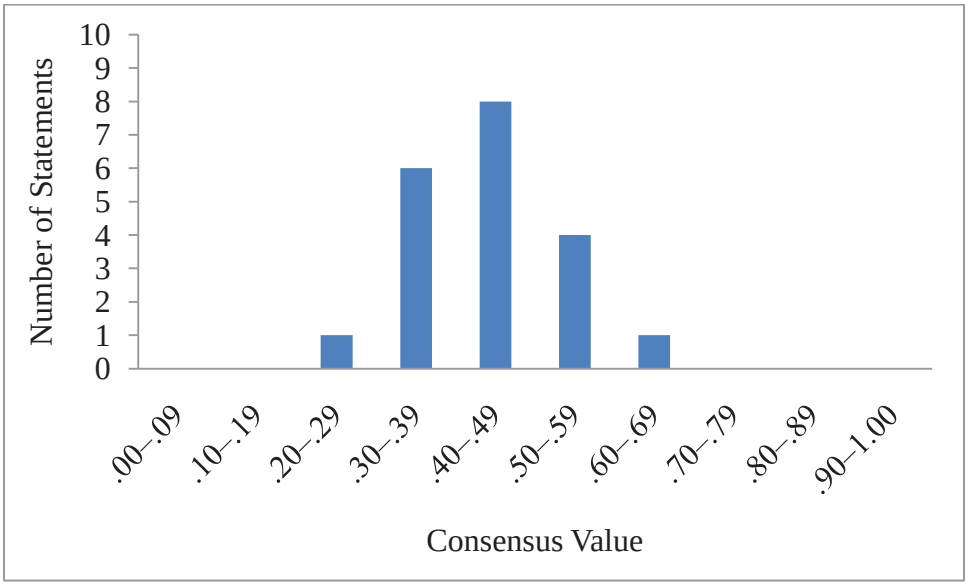
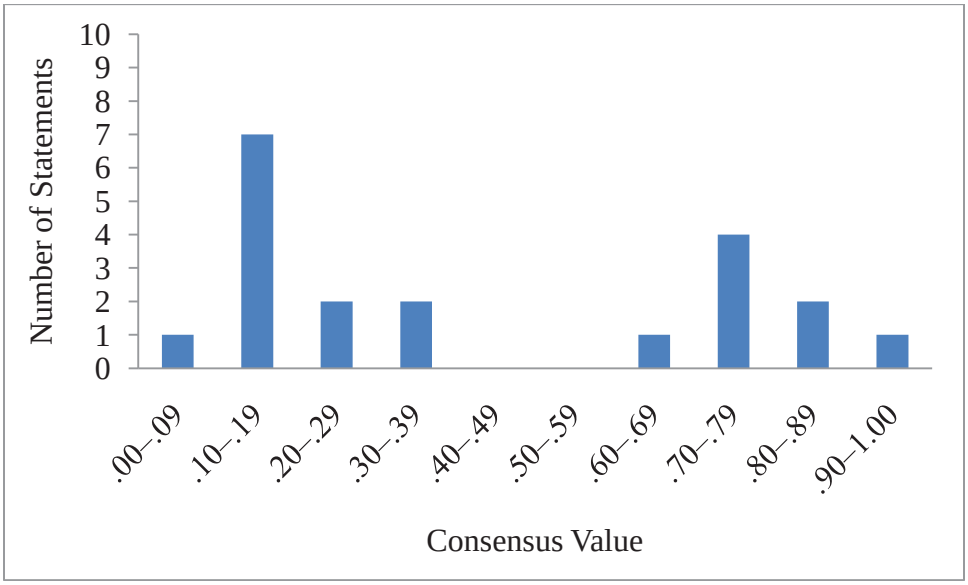


Figure 10

Number of Statements as a Function of Average Consensus Value for Chinese Currency Articles for American Participants



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Analysis of Pattern Use

The third goal of the study was to assess what patterns participants would demonstrate as they described statements categorized as facts versus opinions and whether those patterns would vary across cultural groups. Figures 11 shows the matrix of the six pre-assumed patterns that participants would use as defining a fact or an opinion.

Figure 11

Matrix of Ratings and Pre-assumed Patterns

<table>
<tr><td></td><td colspan="4">You</td></tr>
<tr><td>Others</td><td>1 (Strongly Disagree)</td><td>2 (Disagree)</td><td>3 (Agree)</td><td>4 (Strongly Agree</td></tr>
<tr><td>1 (0%)
2 (About 25%)</td><td colspan="2">Rule 1: I Disagree, Others Disagree</td><td colspan="2">Rule 4: I Agree, Others Disagree</td></tr>
<tr><td>3 (About 50%)</td><td colspan="2">Rule 2: I Disagree, Others Vary</td><td colspan="2">Rule 5: I Agree, Others Vary</td></tr>
<tr><td>4 (About 75%)
5 (100%)</td><td colspan="2">Rule 3: I Disagree, Others Agree</td><td colspan="2">Rule 6: I Agree, Others Agree</td></tr>
</table>

Patterns of Categorizing General Statements as Facts

The researcher's initial hypothesis was that a fact was something that a person would consider to be true and would expect other people to consider it to be true. This would be represented as Pattern 6 in the matrix.

First, the researcher looked at pattern(s) of categorizing facts among the general statements. Figure 12 displays average percentages of patterns used by participants in categorizing facts in the context of general statements. As shown in Figure 12, when statements were categorized as facts they were primarily represented by Pattern 6, that is, "I agree with the

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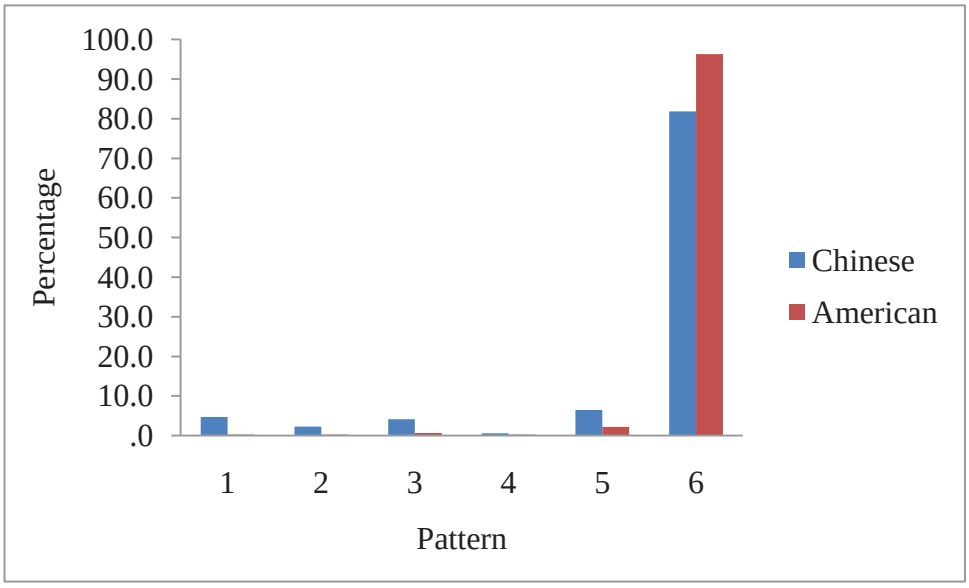
statement and I think others would agree with it also." In the context of general statements, the heavy use of Pattern 6 for defining a fact was seen in both Chinese and American sample.

Figure 12

Average Percentage of General Statements Categorized as Facts Broken down by Six Pre-assumed Patterns for Chinese and American Participants



Patterns of Categorizing Newspaper Article Statements as Facts

The second attempt was exerted in examining pattern(s) of categorizing facts in the context of newspaper articles. The following presents a set of analyses looking into newspaper article statements as to what the pattern(s) would demonstrate when the statements were rated as facts.

In the first set of analysis, statements were collapsed across the four articles. The average percentages of statements rated as facts were computed. The results were broken down by six pre-assumed patterns. Figure 13 shows the average percentages of fact statements broken down by six pre-assumed patterns for the Chinese and American samples. As expected, when statements were categorized as facts they were primarily represented by Pattern 6. It was noted

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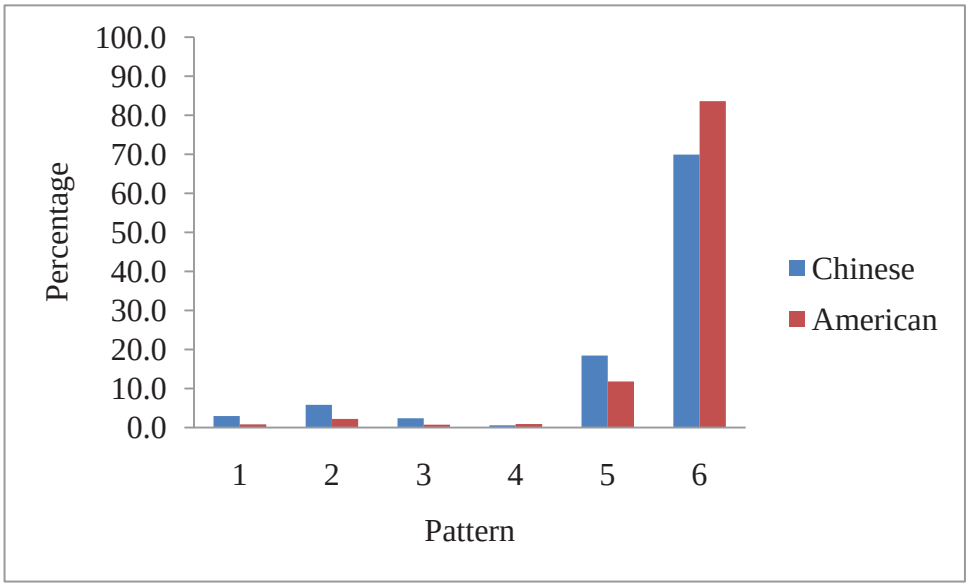
that Pattern 5 was also used in addition to Pattern 6 to define a fact, and this was seen in both Chinese and American samples.

Figure 13

Average Percentage of Statements Categorized as Facts across Four Newspaper Articles Broken down by Six Pre-assumed patterns for Chinese and American Participants



It was interesting to find that Chinese participants did not use Pattern 6 as much as their American counterparts; however, they tended to use Pattern 5 more frequently than the American participants.

A 2 × 2 repeated measure ANOVA was computed to assess whether the frequency of using Pattern 5 and Pattern 6 was statistically different between the Chinese and American samples. In the analysis, the percentage of fact statements categorized by Pattern 5 and the percentage of fact statements categorized by Pattern 6 were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The results showed a significant main effect of pattern,

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$F(1, 140) = 340.40$, $p = .000$, $\eta^2_p = .71$, indicating that the percentage of facts categorized by Pattern 5 was significantly different than the percentage of facts categorized by Pattern 6. The main effect of culture was also significant,

$F(1, 140) = 8.87$, $p = .003$, $\eta^2_p = .06$, indicating that there was a significant difference between the Chinese and American samples in terms of the percentage of statements rated as facts. In addition, the analysis found a significant interaction effect between pattern and culture, $F(1, 140) = 9.10$, $p = .003$, $\eta^2_p = .06$, implying that the difference between Chinese and American samples in the percentage of fact statements varied between Pattern 5 and Pattern 6. In order to take a closer look at the variances between cultures and patterns, two independent samples *t* tests were conducted to compare the cultural difference in percentage of facts categorized by Pattern 5 and in percentage of facts categorized by Pattern 6, respectively. As a result, in the percentage of facts categorized by Pattern 5 there was a significant difference between the Chinese group ($M = .18$, $SD = 0.20$) and the American group ($M = .12$, $SD = 0.17$), $t(1, 140) = 2.12$, $p = .035$. This indicated that Chinese participants used Pattern 5 more frequently than their American counterparts in categorizing facts. As for the percentage of facts categorized by Pattern 6, the analysis also found a significant difference between the Chinese group ($M = .70$, $SD = 0.26$) and the American group ($M = .84$, $SD = 0.21$), $t(1, 140) = -3.44$, $p = .001$. The results suggested that American participants used Pattern 6 more frequently than Chinese participants in categorizing facts.

Instead of looking at statements from all four articles as a whole, the second set of analyses was conducted with statements from each individual article. The average percentage of statements rated as facts was computed and the results were broken down by the pre-assumed six patterns. Figure 14, Figure 15, Figure 16 and Figure 17 show the average percentages of fact

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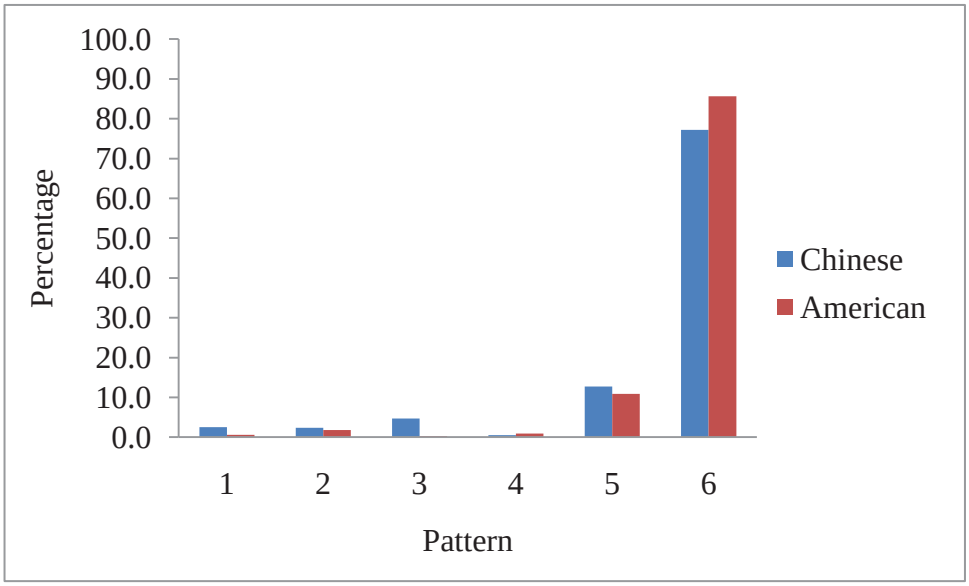
statements broken down by six pre-assumed patterns for Chinese and American samples for each newspaper article. As can be seen, Pattern 6 was primarily used to categorize facts and Pattern 5 was used also. It was noted that Chinese participants did not use Pattern 6 as much as their American counterparts; however, they tended to use Pattern 5 more frequently than the American counterparts.

Figure 14

Average Percentage of Statements Categorized as Facts in the PISA Article from The New York Times Broken down by Six Pre-assumed Patterns for Chinese and American Participants



In order to test whether the observed differences in culture and pattern use were significant, a 2 × 2 repeated measure ANOVA was conducted for each article. In the analysis, the percentage of fact statements categorized by Pattern 5 and the percentage of fact statements categorized by Pattern 6 were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The following presents the results for each article.

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Figure 15

Average Percentage of Statements Categorized as Facts in the PISA Article from China Daily Broken down by Six Pre-assumed Patterns for Chinese and American Participants

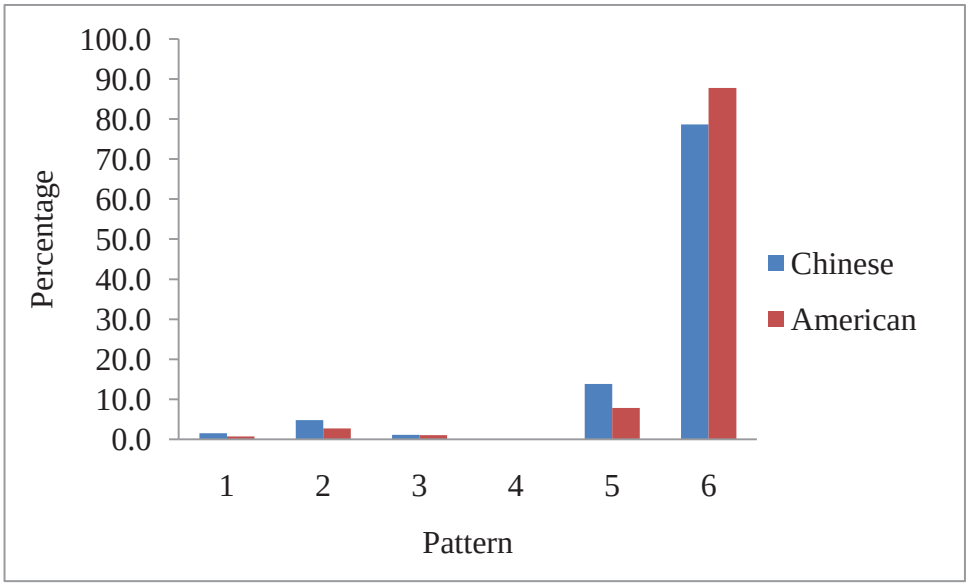

Figure 16

Average Percentage of Statements Categorized as Facts in the Chinese Currency Article from The New York Times Broken down by Six Pre-assumed Patterns for Chinese and American Participants

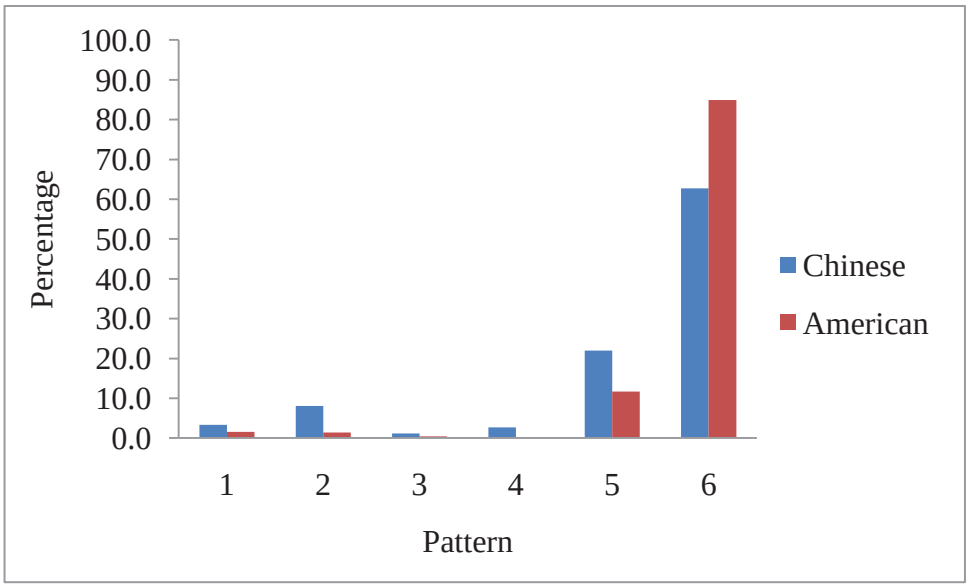

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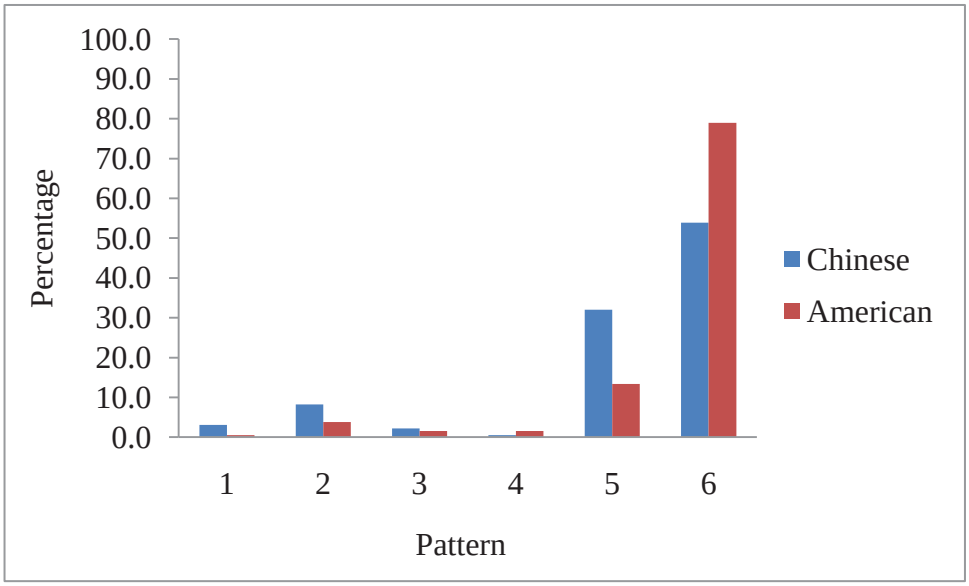
Figure 17

Average Percentage of Statements Categorized as Facts in the Chinese Currency Article from China Daily Broken down by Six Pre-assumed Patterns for Chinese and American Participants



Facts from the PISA article in New York Times. For the PISA article in *The New York Times*, there was a significant main effect of pattern,

$F(1, 136) = 348.38$, $p = .000$, $\eta^2_p = .72$, indicating that the percentage of facts categorized by Pattern 5 was significantly different than the percentage of facts categorized by Pattern 6. The main effect of culture was also significant,

$F(1, 136) = 8.819$, $p = .005$, $\eta^2_p = .06$, indicating that there was a significant difference between the Chinese and American samples in terms of the percentage of statements rated as facts. No interaction effect between pattern and culture was found, $F(1, 136) = 1.844$, $p = .177$, $\eta^2_p = .13$.

Facts from the PISA article in China Daily. For the PISA article in China Daily, there was a significant main effect of pattern, $F(1, 132) = 336.77$, $p = .000$,

$\eta^2_p = .72$, indicating that the percentage of facts categorized by Pattern 5 was significantly different than the percentage of facts categorized by Pattern 6. The main effect of culture was not

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significant, $F(1, 132) = 1.19$, $p = .277$, $\eta^2_p = .01$. No interaction effect between pattern and culture was found, $F(1, 132) = 3.66$, $p = .058$, $\eta^2_p = .03$.

Facts from the Chinese currency article in New York Times. For the Chinese currency article in The New York Times, there was a significant main effect of pattern, $F(1, 130) = 150.47$, $p = .000$, $\eta^2_p = .54$, indicating that the percentage of facts categorized by Pattern 5 was significantly different than the percentage of facts categorized by Pattern 6. The main effect of culture was also significant, $F(1, 130) = 11.69$, $p = .001$, $\eta^2_p = .08$, indicating that there was a significant difference between the Chinese and American samples in terms of the percentage of statements rated as facts. In addition, the analysis found a significant interaction effect between pattern and culture, $F(1, 130) = 12.22$, $p = .001$, $\eta^2_p = .09$, implying that the difference between Chinese and American sample in the percentage of fact statements varied between Pattern 5 and Pattern 6. In order to take a closer look at the variances between cultures and patterns, two independent samples *t* tests were conducted to compare the cultural difference in percentage of facts categorized by Pattern 5 and in percentage of facts categorized by Pattern 6, respectively. As for the percentage of facts categorized by Pattern 5, there was a significant difference between the Chinese group ($M = .22$, $SD = 0.27$) and the American group ($M = .12$, $SD = 0.22$), $t(1, 130) = 2.39$, $p = .018$. The results indicated that Chinese participants used Pattern 5 more frequently than their American counterparts in categorizing facts. As for the percentage of facts categorized by Pattern 6, there was also a significant difference between the Chinese group ($M = .63$, $SD = 0.36$) and the American group ($M = .85$, $SD = 0.27$), $t(1, 130) = -4.01$, $p = .000$. The results suggested that American participants used Pattern 6 more frequently than Chinese participants in categorizing facts.

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Facts from the Chinese currency article in China Daily. For the Chinese currency article in China Daily, there was a significant main effect of pattern, $F(1, 126) = 77.60$, $p = .000$, $\eta^2_p = .38$, indicating that the percentage of facts categorized by Pattern 5 was significantly different than the percentage of facts categorized by Pattern 6. The main effect of culture was not significant, $F(1, 126) = 2.98$, $p = .087$. $\eta^2_p = .02$. The analysis found a significant interaction effect between pattern and culture, $F(1, 126) = 19.29$, $p = .000$, $\eta^2_p = .13$, implying that the difference between Chinese and American sample in the percentage of fact statements varied between Pattern 5 and Pattern 6. In order to take a closer look at the variances between cultures and patterns, two independent samples *t* tests were conducted to compare the cultural difference in percentage of facts categorized by Pattern 5 and in percentage of facts categorized by Pattern 6, respectively. As for the percentage of facts categorized by Pattern 5, there was a significant difference between the Chinese group ($M = .22$, $SD = 0.27$) and the American group ($M = .32$, $SD = 0.33$), $t(1, 126) = 3.86$, $p = .000$. The results indicated that Chinese participants used Pattern 5 more frequently than their American counterparts in categorizing facts. As for the percentage of facts categorized by Pattern 5, there was also a significant difference between the Chinese group ($M = .54$, $SD = 0.36$) and the American group ($M = .79$, $SD = 0.30$), $t(1, 126) = 4.35$, $p = .000$. The results suggested that American participants used pattern 6 more frequently than Chinese participants.

Patterns of Categorizing General Statements as Opinions

In studying patterns of categorizing opinions, the researcher found that in the context of general statements opinions were represented by a wide range of patterns from Pattern 1 to

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Pattern 6. Figure 18 shows the average percentages of opinion statements broken down by six pre-assumed patterns for Chinese and American sample.

A further attempt was exerted in looking at patterns used by participants to categorize opinions in the context of newspaper articles. The following presents a set of analyses looking into newspaper article statements as to what pattern(s) would demonstrate when the statements were rated as opinions.

Patterns of Categorizing Newspaper Article Statements as Opinions

In looking at statements rated as opinions, the researcher collapsed statements across four articles and computed the average percentages of statements rated as opinions for the Chinese and American groups. The results were broken down by six pre-assumed patterns. Figure 19 shows the average percentages of opinions broken down by six patterns for Chinese and American participants. As can be seen, when statements were rated as opinions they were represented by a wide range of patterns from Pattern 1 to Pattern 6. It is worthy to note that a higher percentage of opinion statements were represented by patterns which included "I agree" (i.e., Pattern 4, Pattern 5, Pattern 6) than patterns which included "I disagree" (i.e., Pattern 1, Pattern 2, Pattern 3). For the purpose of the analysis, the researcher combined the opinion statements categorized by Pattern 1, Pattern 2, and Pattern 3, and named the combination as "the pattern of disagreement;" at the same time, the opinion statements categorized by Pattern 4, Pattern 5, and Pattern 6 were combined, and the combination was named as "the pattern of agreement." Figure 20 shows the percentage of opinions for Chinese and American samples broken down to the pattern of agreement and the pattern of disagreement.

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Figure 18

Average Percentage of General statements Categorized as Opinions Broken down by Six Pre-assumed Patterns for Chinese and American Participants

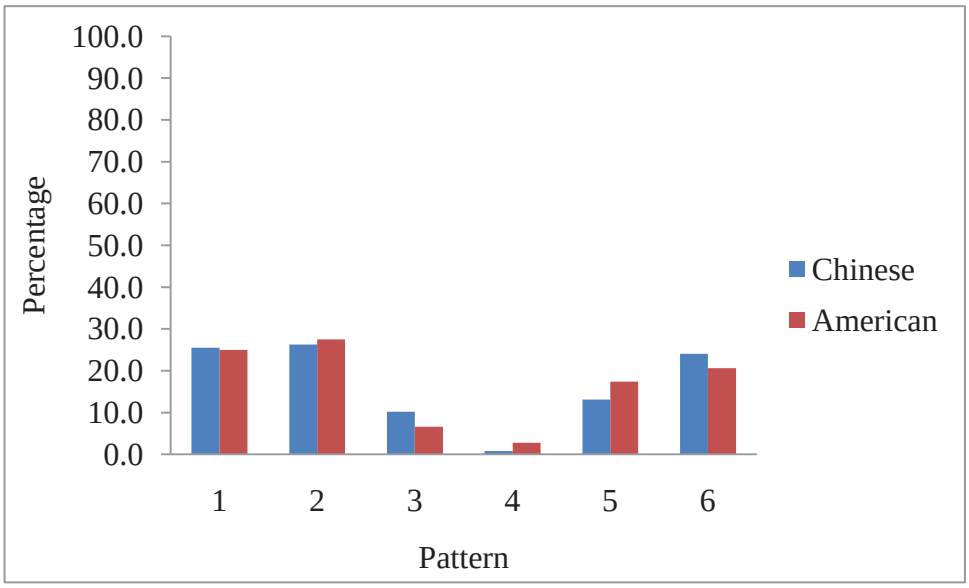

Figure 19

Average Percentage of Statements Categorized as Opinions across Four Newspaper Articles Broken down by Six Pre-assumed Patterns for Chinese and American Participants

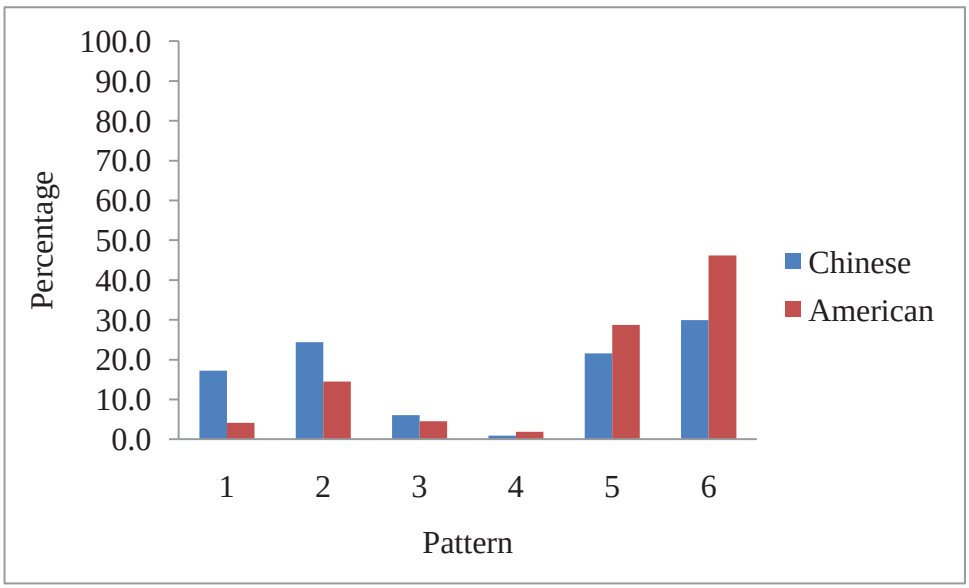

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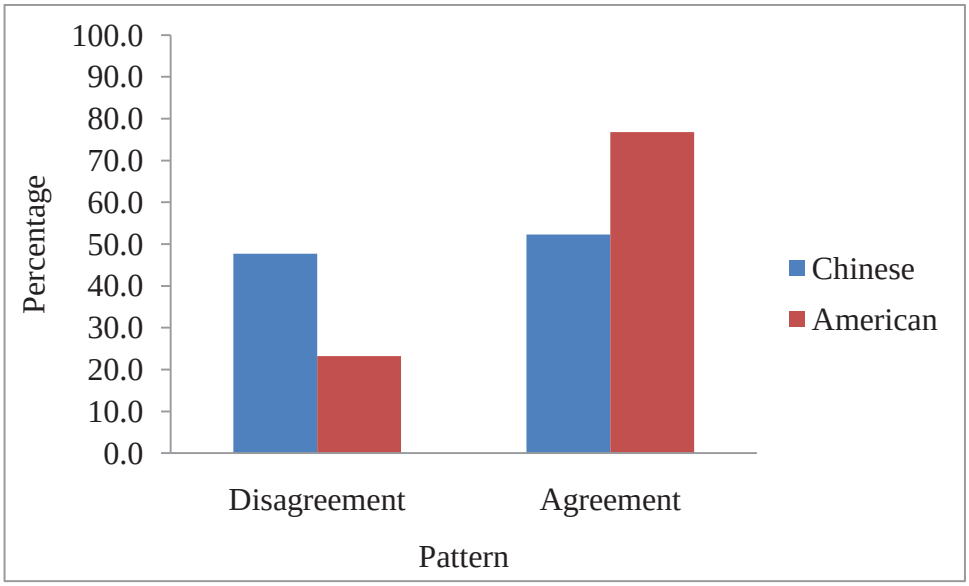
Figure 20

Average Percentage of Statements Categorized as Opinions across Four Newspaper Articles Broken down by Pattern of Disagreement and Pattern of Agreement for Chinese and American Participants



A 2 × 2 repeated measure ANOVA was calculated to assess whether the observed differences between cultures and patterns were significant. In the analysis, the pattern of agreement and the pattern of disagreement were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The analysis found a significant main effect of pattern, $F(1, 141) = 77.03$, $p = .000$, $\eta^2_p = .35$, indicating that there was a significant difference between the percentage of opinions categorized by the pattern of agreement and the percentage of opinions categorized by the pattern of disagreement. $F(1, 141) = 0.00$, $p = 1.000$, $\eta^2_p = 1.00$. The analysis found a significant interaction effect between pattern and culture, $F(1, 141) = 54.34$, $p = .000$, $\eta^2_p = .28$, implying that the difference between the Chinese and American samples in the percentage of opinions varied between the pattern of agreement and the pattern of disagreement. In order to take a closer look at the variances between cultures and patterns, two independent sample *t* tests were conducted to

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compare the cultural difference in percentage of opinions categorized by the pattern of agreement and by the pattern of disagreement, respectively. For the pattern of disagreement, there was a significant difference between the Chinese group (M = .48, SD = 0.25) and the American group (M = .23, SD = 0.13), $t(1,141) = 7.37$, p = .000. The results indicated that Chinese participants used the pattern of disagreement more frequently than their American counterparts in categorizing opinions. For the pattern of agreement, there was also a significant difference between the Chinese group (M = .52, SD = 0.25) and the American group (M = .77, SD = 0.13), $t(1, 141) = -7.371$, p = .000. The results suggested that American participants used the pattern of agreement more frequently than Chinese participants.

Instead of looking at statements from all four articles as a whole, the following analyses will focus on statements from each individual article. Figure 21, Figure 22, Figure 23, and Figure 24 present the average percentages of opinions for Chinese and American participants broken down by six pre-assumed patterns. As can be seen, for each article the opinion statements were represented by a wide range of patterns from Pattern 1 to Pattern 6. In this part of the analysis, the researcher employed the same procedure as was used in the previous analysis, that is, Pattern 1, Pattern 2, and Pattern 3 were combined into one pattern named "pattern of disagreement" and Pattern 4, Pattern 5 and Pattern 6 were combined into one pattern named "pattern of agreement." Figure 25, Figure 26, Figure 27, and Figure 28 display the percentages of opinions for Chinese and American sample broken down by the pattern of agreement and the pattern of disagreement. As can be seen, participants tended to use the pattern of agreement more frequently than the pattern of disagreement. A 2 × 2 repeated measure ANOVA was computed for each article to look at the cultural difference in percentage of opinions categorized by the pattern of agreement and the pattern of disagreement.

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Figure 21

Average Percentage of Statements Categorized as Opinions in the PISA Article from The New York Times Broken down by Six Pre-assumed Patterns for Chinese and American Participants

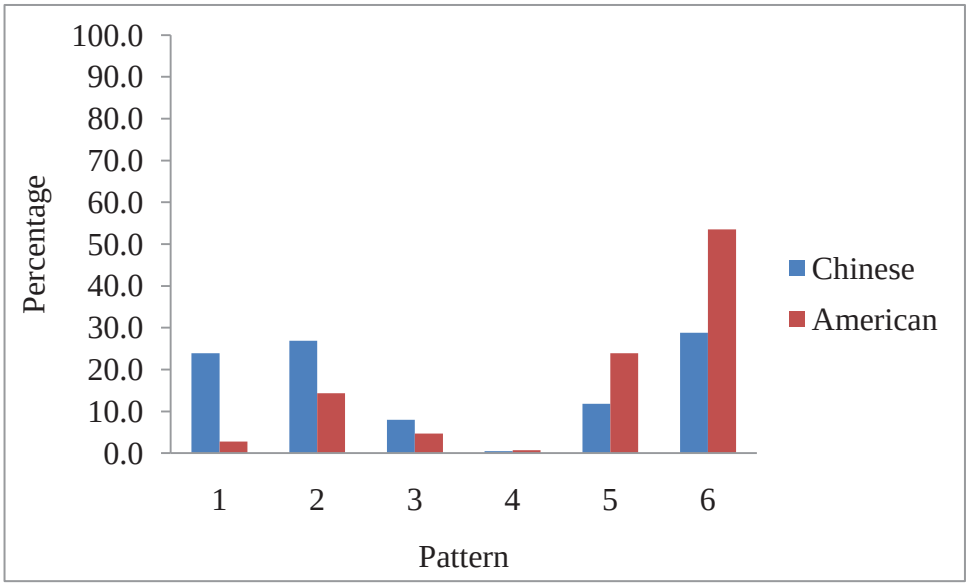

Figure 22

Average Percentage of Statements Categorized as Opinions in the PISA Article from China Daily Broken down by Six Pre-assumed Patterns for Chinese and American Participants

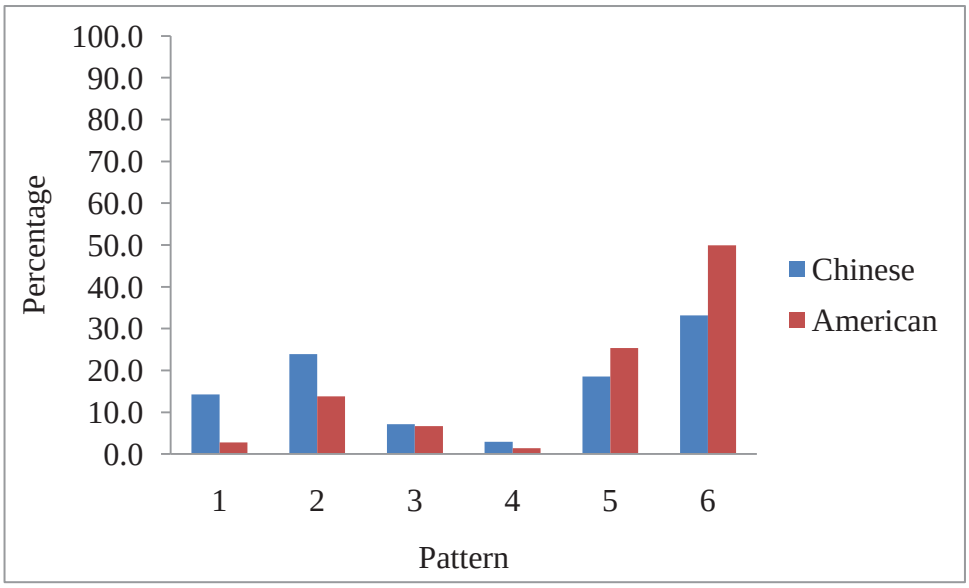

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Figure 23

Average Percentage of Statements Categorized as Opinions in the Chinese Currency Article from The New York Times Broken down by Six Pre-assumed Patterns for Chinese and American Participants

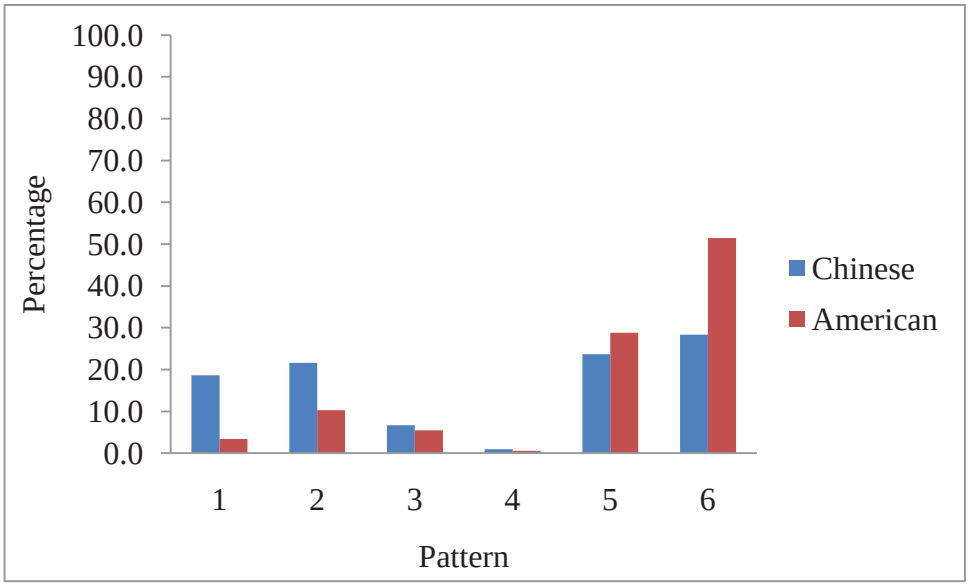

Figure 24

Average Percentage of Statements Categorized as Opinions in the Chinese Currency Article from China Daily Broken down by Six Pre-assumed Patterns for Chinese and American Participants

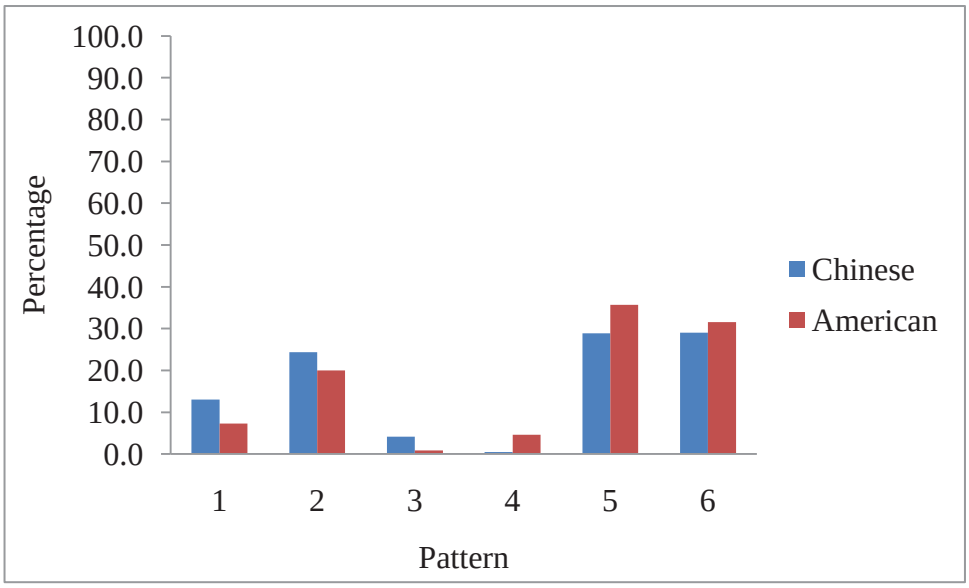

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Figure 25

Average Percentage of Statements Categorized as Opinions in the PISA Article from The New York Times Broken down by Pattern of Disagreement and Pattern of Agreement for Chinese and American Participants

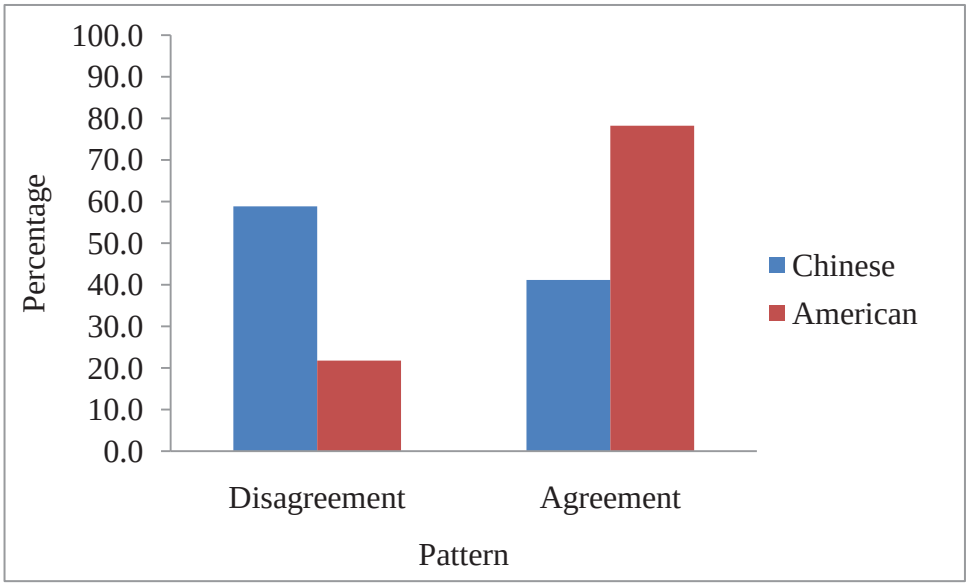

Figure 26

Average Percentage of Statements Categorized as Opinions in the PISA Article from China Daily Broken down by Pattern of Disagreement and Pattern of Agreement for Chinese and American Participants

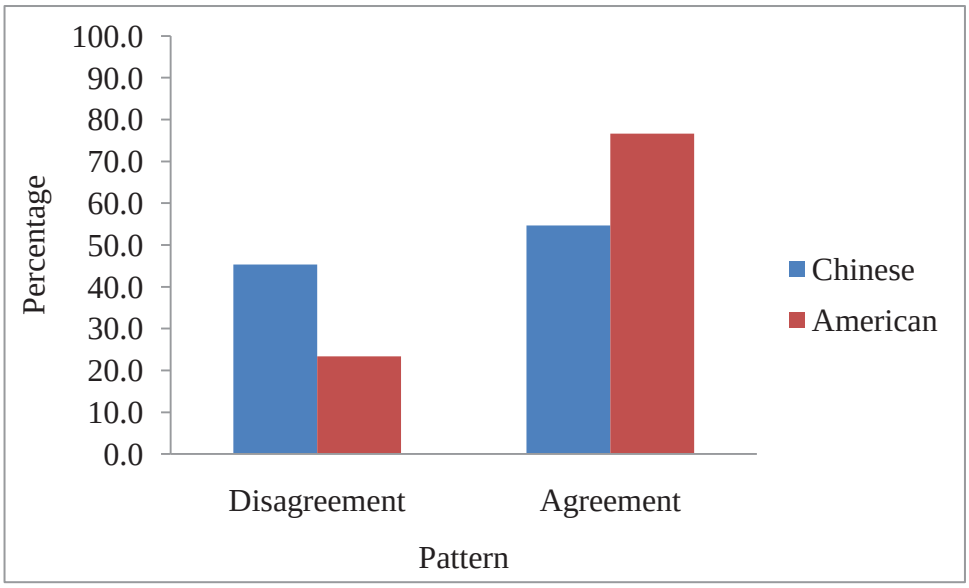

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Figure 27

Average Percentage of Statements Categorized as Opinions in the Chinese Currency Article from The New York Times Broken down by Pattern of Disagreement and Pattern of Agreement for Chinese and American Participants

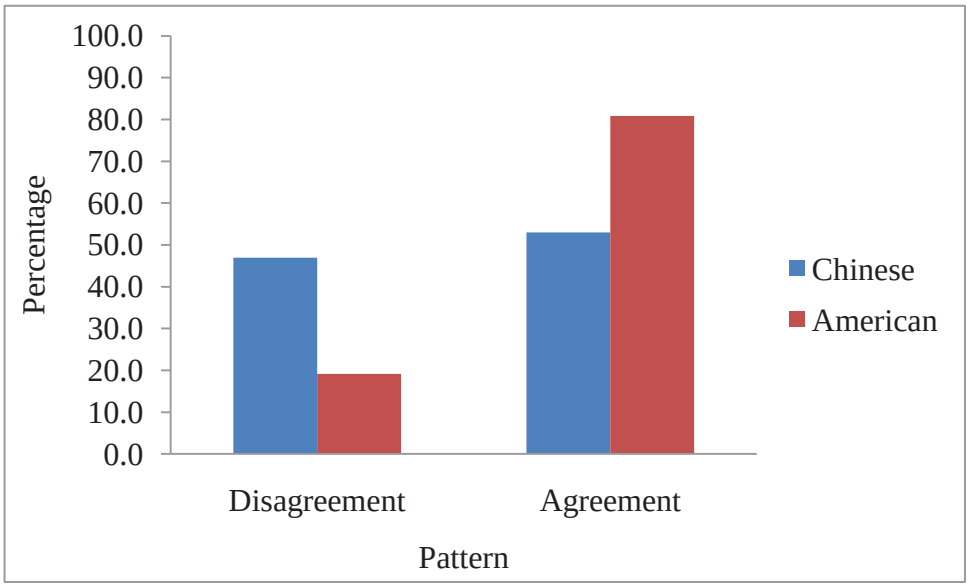
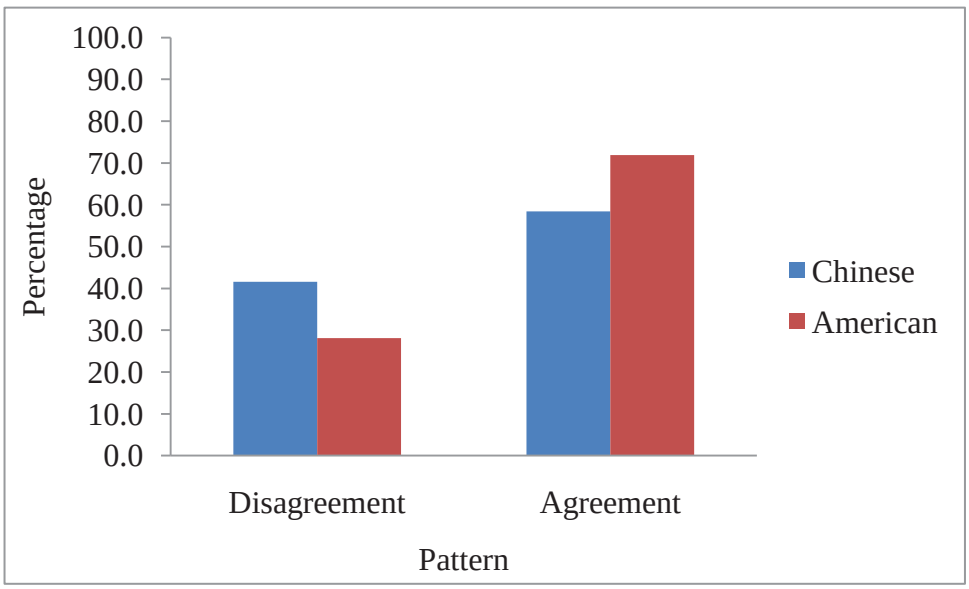


Figure 28

Average Percentage of Statements Categorized as Opinions in the Chinese Currency Article from China Daily Broken down by Pattern of Disagreement and Pattern of Agreement for Chinese and American Participants



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Opinions from the PISA article in New York Times. The first set of 2 × 2 repeated measure ANOVA was conducted with the statements from the PISA article in *The New York Times*. In the analysis, the pattern of agreement and the pattern of disagreement were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The analysis found a significant main effect of pattern, $F(1, 138) = 19.96$, $p = .000$, $\eta^2_p = .13$, indicating that there was a significant difference between the percentage of opinions categorized by the pattern of agreement and the percentage of opinions categorized by the pattern of disagreement. The main effect of culture was not significant, $F(1, 138) = 0.00$, $p = 1.000$, $\eta^2_p = 1.00$. The analysis found a significant interaction effect between pattern and culture, $F(1, 138) = 72.76$, $p = .000$, $\eta^2_p = .35$, implying that the difference between the Chinese and American samples in the percentage of opinions varied between the pattern of agreement and the pattern of disagreement. In order to take a closer look at the variances between cultures and patterns, two independent sample *t* tests were conducted to compare the cultural difference in percentage of opinions categorized by the pattern of disagreement and by the pattern of agreement, respectively. For the pattern of disagreement, there was a significant difference for the Chinese group ($M = .59$, $SD = 0.30$) and for the American group ($M = .22$, $SD = 0.20$), $t(1,138) = 8.53$, $p = .000$. The results indicated that Chinese participants used the pattern of disagreement more frequently than their American counterparts in categorizing opinions. For the pattern of agreement, there was also a significant difference between the Chinese group ($M = .41$ $SD = 0.30$) and the American group ($M = .78$, $SD = 0.20$), $t(1, 141) = -8.53$, $p = .000$. The results suggested that American participants used the pattern of agreement more frequently than Chinese participants.

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Opinions from the PISA article in China Daily. The second set of 2 × 2 repeated measure ANOVA was computed with the statements from the PISA article in China Daily. In the analysis, the pattern of agreement and the pattern of disagreement were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The analysis found a significant main effect of pattern, $F(1, 138) = 45.82$, $p = .000$, $\eta^2_p = .25$, indicating that there was a significant difference between the percentage of opinions categorized by the pattern of agreement and the percentage of opinions categorized by the pattern of disagreement. The main effect of culture was not significant, $F(1, 138) = 0.00$, $p = 1.000$, $\eta^2_p = 1.00$. The interaction effect between pattern and culture was found to be significant, $F(1, 138) = 22.57$, $p = .000$, $\eta^2_p = .14$, implying that the difference between the Chinese and American samples in the percentage of opinions varied between the pattern of agreement and the pattern of disagreement. In order to take a closer look at the variances between cultures and patterns, two independent sample *t* tests were conducted to compare the cultural difference in percentage of opinions categorized by the pattern of disagreement and by the pattern of agreement, respectively. For the pattern of disagreement, there was a significant difference between the Chinese group ($M = .45$, $SD = 0.34$) and the American group ($M = .23$, $SD = 0.19$), $t(1, 138) = 4.751$, $p = .000$. This indicated that Chinese participants used the pattern of disagreement more frequently than their American counterparts in categorizing opinions. For the pattern of agreement, there was also a significant difference between the Chinese group ($M = .55$, $SD = 0.34$) and the American group ($M = .77$, $SD = 0.19$), $t(1,141) = -4.75$, $p = .000$. The results suggested that American participants used the pattern of agreement more frequently than Chinese participants.

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Opinions from the Chinese currency article in The New York Times. The third set of 2 × 2 repeated measure ANOVA was conducted with the statements from the Chinese currency article in *The New York Times*. In the analysis, the pattern of agreement and the pattern of disagreement were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The analysis found a significant main effect of pattern, $F(1, 137) = 54.12$, $p = .000$, $\eta^2_p = .28$, indicating that there was a significant difference between the percentage of opinions categorized by the pattern of agreement and the percentage of opinions categorized by the pattern of disagreement. The main effect of culture was not significant, $F(1, 137) = 0.00$, $p = 1.000$, $\eta^2_p = 1.00$. The interaction effect between pattern and culture was also significant, $F(1, 137) = 36.47$, $p = .000$, $\eta^2_p = .21$, implying that the difference between Chinese and American sample in the percentage of opinions varied between the pattern of agreement and the pattern of disagreement. In order to take a closer look at the variances between cultures and patterns, two independent sample *t* tests were conducted to compare the cultural difference in percentage of opinions categorized by the pattern of disagreement and by the pattern of agreement, respectively. For the pattern of disagreement, there was a significant difference between the Chinese group ($M = .47$, $SD = 0.30$) and the American group ($M = .19$, $SD = 0.24$), $t(1, 137) = 6.04$, $p = .000$. This indicated that Chinese participants used the pattern of disagreement more frequently than their American counterparts in categorizing opinions. For the pattern of agreement, there was also a significant difference between the Chinese group ($M = .53$ $SD = 0.30$) and the American group ($M = .81$, $SD = 0.24$), $t(1, 137) = -6.04$, $p = .000$. The results suggested that American participants used the pattern of agreement more frequently than Chinese participants.

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Opinions from the Chinese currency article in China Daily. The fourth set of 2 × 2 repeated measure ANOVA was conducted with the statements from the Chinese currency article in *China Daily*. In the analysis, the pattern of agreement and the pattern of disagreement were the two levels of the within-subject factor named "pattern" and culture was the between-subject variable. The analysis found a significant main effect of pattern, $F(1, 138) = 36.83$, $p = .000$, $\eta^2_p = .21$, indicating that there was a significant difference between the percentage of opinions categorized by the pattern of agreement and the percentage of opinions categorized by the pattern of disagreement. The main effect of culture was not significant, $F(1, 138) = 0.00$, $p = 1.000$, $\eta^2_p = 1.00$. The interaction effect between pattern and culture was found to be significant, $F(1, 138) = 7.283$, $p = .008$, $\eta^2_p = .05$, implying that the difference between the Chinese and American sample in the percentage of opinions varied between the pattern of agreement and the pattern of disagreement. In order to take a closer look at the variances between cultures and patterns, two independent sample *t* tests were conducted to compare the cultural difference in percentage of opinions categorized by the pattern of disagreement and by the pattern of agreement, respectively. For the pattern of disagreement, there was a significant difference between the Chinese group ($M = .42$, $SD = 0.34$) and the American group ($M = .28$, $SD = 0.24$), $t(1, 138) = 2.699$, $p = .008$. This indicated that Chinese participants used the pattern of disagreement more frequently than their American counterparts in categorizing opinions. For the pattern of agreement, there was also a significant difference between the Chinese group ($M = .58$, $SD = 0.34$) and the American group ($M = .72$, $SD = 0.24$), $t(1, 138) = -2.70$, $p = .008$. The results suggested that American participants used the pattern of agreement more frequently than Chinese participants.

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CHAPTER V

DISCUSSION

The purpose of the study was to examine how people from different cultures distinguish facts versus opinions. To be specific, cultural differences were explored in the context of six pre-assumed patterns which were defined by two aspects: how much you think the statement is true and how much you think other people think the statement is true. The instrument was a questionnaire developed by the researcher which included 20 statements taken from common knowledge and 40 statements taken from *The New York Times* and *China Daily*. Participants were asked to rate how much they would agree with the statements, how much they think other people would agree with the statements, and define whether the statements were facts or opinions.

Summary and Review of Findings

The first goal of the study was to examine whether participants distinguish facts from opinions in two different contexts (i.e., general statements versus newspaper article statements). It was shown that participants, both Chinese and American, were able to distinguish facts from opinions among general statements as well as news paper article statements. In addition, they tended to categorize more opinions than facts in both contexts demonstrating an opinion bias toward the statements.

An item analysis of the general statements revealed that 10 out of 20 statements were categorized as opinions by an overwhelmingly high percentage of American participants. The following displays the 10 statements:

- Christmas is a holiday primarily for children.
- Sleeping with the windows open is good for you.

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- Cats are friendly animals.
- Rock music has a bad influence on young people.
- It is okay to lie.
- Comic strips are funny.
- Rich people are happy people.
- The telephone is the greatest invention of all time.
- The longer you stay in school the smarter you will become.
- Children are happy and care-free.

The same 10 general statements were also considered to be opinions by a fairly high percentage of Chinese participants but the percentage was not as high as the American participants. It was worthy to note that there were three statements on which Chinese and American participants appeared to hold very different views as to whether they were facts or opinions. For example, Item 12 (Books may be borrowed from the library.) was rated an opinion by most of the Chinese; whereas most of the American participants consider it to be a fact. The explanation for Item 12 being more fact-oriented in the American sample versus being more opinion-oriented in the Chinese sample may be related to some contextual factors, such as curriculum, the frequency of student's access to library, etc. For instance, from the researcher's personal experience Chinese undergraduate education focus on text-book contents and exams rather than research. Most of the time students may not use library resources to do their school work. However, most American college curriculum is designed to encourage students to find a solution to a problem through doing research with help from a wide variety of resources. Libraries are considered to play a very important role in helping students open up their minds and explore the world. It was assumed that American students tended to relate books more to the

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library while Chinese students did not. Large rating discrepancies between the Chinese and American samples were also found in Item 1 (A hammer is a tool used to pound nails.) and Item 7 (Cars require fuel in order to run.) Chinese participants were more likely to consider the two statements to be opinions; whereas, American participants tended to categorize them as facts. It is not easy to interpret the reasons why Chinese and Americans showed a distinctive pattern in categorizing these two statements. However, the researcher thought it may be a result of different academic backgrounds. The Chinese participants were all engineering students (i.e., computer science); whereas, most of American participants were studying in non-engineering/science fields like social sciences, business, humanities, etc. It is not hard to notice that both Item 1 and 7 seem to describe an event related to engineering/mechanics. (e.g., hammer, car.) It is assumed that someone from an engineering/science background would use more critical rules/standards than one from a non-engineering major to evaluate the content related to engineering. For example, most Chinese participants thought "Cars require fuel in order to run" was an opinion because they might say that nowadays cars can also run by using other natural resources such as electricity, sun energy, etc.

In the context of newspaper articles, the researcher found that Chinese participants were more likely to categorize statements taken from *China Daily* than their American counterparts. This supported the assumption of media bias that people are inclined to consider information to be factual if the information is obtained through a medium that they are familiar with. In this case, Chinese participants tended to accept as fact articles from *China Daily*, a Chinese newspaper; however, in *The New York Times* articles, there were no significant differences between Chinese and Americans in terms of the percentage of facts were categorized. This indicated that the credibility of *The New York Times* was equally weighted by Chinese and

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Americans. It seemed that Americans did not have a bias toward *The New York Times* because it was an American newspaper.

As for looking at the effect of culture and news article topic on categorization, the results indicated that Chinese participants were more likely to categorize statements taken from the PISA articles as facts than their American counterparts. However, the researcher did not find a significant cultural difference in the Chinese currency article. The findings somewhat reflected a limitation of the instrument where the article contents may be biased toward one cultural group rather than the other. The two PISA articles, from both *The New York Times* and *China Daily*, reported the news that Chinese students in Shanghai scored tops in international standardized testing, i.e., PISA exams, which in general appeared as good news to Chinese participants but neutral or not-so-good news to American participants. Particularly, *The New York Times* article focused on Chinese students' outstanding performance and indicated that American education fell behind. It is understood that people would doubt information that appears to be negative with regard to their nationality. In this case, Americans would be less likely to consider statements regarding the PISA topic, especially those statements indicating that American education is inferior as facts. Comparatively, the two articles regarding Chinese currency seem to be more neutral, discussing pressures that China had faced about raising their currency and how this would affect the world economy.

The second goal of the study was to assess whether participants agreed with each other as to which statements were facts and which were opinions. In the context of general statements, there was consensus among American participants as to which statements were facts versus opinions but no consensus were found among Chinese participants. In the context of newspaper articles, there was no consensus among Chinese participants as to which statements were facts

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and which were opinions. However, American participants were found to be in agreement on facts/opinions when it came to the articles regarding Chinese currency. The findings were surprising because this is in contrast to the assumptions proposed in the cognitive model of holistic versus analytic. In this model, East Asians were regarded to be holistic-minded people who seek harmony and attempt to resolve contradictions by accepting arguments from both sides. People of analytic thinking, mostly Westerners, were individualism-oriented, more engaged in debates, and non-compromising in contradiction; Second, the results were not consistent with what was found in Feng and Rabinowitz's study. The study revealed that participants tended to agree on which were facts and which were opinions; in addition, the Chinese sample seemed to have a higher agreement than the American sample.

The third goal of the study was to assess what patterns participants would demonstrate as they described statements categorized as facts versus opinions and whether those patterns would vary across cultural groups. The analyses demonstrated that Pattern 6 was primarily used to categorize facts in both cultural groups. For the two articles regarding Chinese currency, Chinese participants were found to use Pattern 5 more frequently than American participants to categorize facts; however, they were less likely to use Pattern 6 than their American counterparts. The findings were interesting but also can be explained by cultural differences in dialectical thinking, that is East Asians would be more likely to tolerate contradiction and take both sides while Westerners would be less accepting of contradictions and tend to take only one side. The tendency of Chinese using more Pattern 5, which states "I believe it is true but I think others may or may not think it is true," implied their belief that truth can exist in contradiction; however, evidence was only found in the two articles regarding Chinese currency.

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In categorizing an opinion, the results showed that participants tended to use a wide range of patterns from Pattern 1 to Pattern 6; however, participants used patterns which included "I agree" (i.e., Pattern 4, 5, 6) more frequently than patterns which included "I disagree" (i.e., Pattern 1, 2, 3). In each one of the four articles, Chinese participants were more likely to use a pattern of disagreement than American participants; however, they were less likely to use a pattern of agreement than their American counterparts to categorize opinions. The findings showed that when defining an opinion the Chinese tended to think of it as something they did not initially believe; whereas, American participants did not seem to use the premise of "I disagree" as much as their Chinese counterparts.

Limitations of the Study

One limitation lies in sample selection. Random sampling was used to recruit American participants so that the sample included students from a variety of majors/concentration of study. However, the Chinese sample was a convenience sample that the researcher obtained through a personal contact at a Chinese university. All the Chinese participants were from the same academic background—computers and engineering. Individual differences were expected in critical thinking/reasoning between students who study liberal arts and those who study STEM subjects. Therefore, differences in their major may have skewed the results.

The second limitation was found in the instrument itself. For example, the two PISA score articles, from both *The New York Times* and *China Daily*, reported the news that Chinese students in Shanghai scored highest in international standardized testing. It appears that the content favors Chinese participants because the content is positive about China. Thus, a perception bias could rise where people prefer information that sounds positive to them. Even

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though media bias is unavoidable, the researcher should make an effort to search for articles which are neutral in content and tone.

Recommendations for Future Research

As mentioned, culture is a multidimensional construct. For future research, it is important that the researcher control for culture so that the effects of different contextual variables can be measured. The cross-cultural literature indicates that within a culture variations are found in traits, attitudes, values, opinions, worldviews, or norms, etc (e.g., Leung et al., 2002; Matsumoto, Weissmann, Preston, Brown, & Kuppersbusch, 1997; Schwartz, Melech, Lehmann, Harris, & Owens, 2001; Schwartz & Ros, 1995). In the current study, variations within the culture were not taken into account. Therefore, the study did not help us understand what aspect(s) of culture affect the variable(s) being compared across cultures.

In the current study, the Chinese sample consists of native Chinese who are attending college in China. Future research can be conducted with the Chinese population in the United States, they may include native Chinese who study at a U.S. college, Chinese American college students who were born in the United States, and/or Chinese college students who are naturalized American citizens. By looking at Chinese populations in the United States, the researcher would better understand the influence of acculturation in addition to culture on how people evaluate information.

The research can extend to examine how language affects ways in which people evaluate information. For example, within the Chinese American population the researcher look at differences between bilinguals (people speaking both English and Chinese) and people speaking English only. The researcher can also look at how language would confound the effects of acculturation and culture.

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Conclusion

The study demonstrated that participants were able to distinguish facts and opinions. Chinese were found to categorize more facts from China Daily than did American participants, which supported the assumption of media bias that people are more likely to consider information to be factual if the information is obtained through a medium they favor. However, the study did not find the same pattern in the American sample. It is surprising that no consensus was found in the Chinese sample as to what are facts and what are opinions; however, the results showed that there was agreement among American participants in the context of general statements and in the context of news article statements regarding Chinese currency. In general, the study indicated that Chinese participants tended to be more tolerant and acceptable of contradictions. For example, they determined a fact could be something that I agree with but others may or may not agree with.

It is noted that the results reflected limitations in sampling and material. Future research may treat culture as a multidimensional construct and explore variations across Chinese populations in the United States.

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APPENDIX

REPORT OF ACTION WITH APPROVAL FOR THE PROTOCOL FOR HUMAN SUBJECT RESEARCH

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FORDHAM UNIVERSITY
THE JESUIT UNIVERSITY OF NEW YORK

GRADUATE SCHOOL OF SOCIAL SERVICE

MEMORANDUM

To: Jing Feng
From: Cathy Berkman, Local Representative, Fordham University IRB
Date: May 19, 2011 (2nd on this date)
Re: Report of action

Enclosed please find a copy of the Report of Action with approval for the Protocol for Human Subject Research that you recently submitted to the Institutional Review Board (IRB).

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FORDHAM UNIVERSITY ***Institutional Review Board***

REPORT OF ACTION

REVIEW DATE: May 19, 2011 (2nd on this date)

PROJECT TITLE: Distinguishing Facts and Opinions in Newspaper Articles: A Cross-Cultural Study between Chinese and Americans

PRINCIPAL INVESTIGATOR: Jing Feng

FACULTY SPONSOR: Mitch Rabinowitz

SCHOOL/DEPARTMENT: Graduate School of Education

REVIEW TYPE: __X__new _____continuing _____if continuing, date of last review

_____exempt (category) __7__expedited (category) _____full board

RISK JUDGMENT: __X__minimal risk _____greater than minimal risk

_____risk with direct benefit (for minors) _____risk with no direct benefit (for minors)

IRB ACTION: __X__approved _____approval pending _____approved until (date)

Your protocol and Informed Consent have been reviewed and approved by the Fordham University Institutional Review Board. This project was reviewed under expedited category 7 of Federal Regulations 45 CFR 46.101:

> (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

NOTES:

1 The approval is given for a maximum of 1 year. Multiple year projects require continuing review. It is the responsibility of the researcher to submit an IRB protocol prior to the end of the approved period.

2 If there are any adverse events or unanticipated problems involving risks to subjects or others or any complaints about the research that occurs during the period of approval,

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please contact the Office of the IRB immediately at (212) 636-7946 or by email at irb@fordham.edu.

3 Investigators are responsible for reporting in writing to the IRB any changes to the human subject research protocol, measures, or informed consent documents. This includes changes to the research design or procedures that could introduce new or increased risks to human subjects and thereby change the nature of the research. These changes are sent for review before they are introduced by the PI.

4 The investigator(s) identified above are required to retain an IRB protocol file, including a record of IRB-related activity, data summaries and consent forms. This file is to be made available for review for internal procedural (audit) monitoring.

Cathy Berkman May 19, 2011

For the Institutional Review Board Date

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