

CHAPTER 14

Culture and Cognition

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INTRODUCTION

A few fish are swimming in a pond. With the same scene, some people may focus mainly on the fish, whereas others may also notice the seaweed in the pond and how the fish swim around it. When one fish swims ahead of the others, some people may think it is the leader of the group, whereas others may think it is being chased. The same scenes can be perceived and understood differently by different people. One factor that influences how we perceive and interpret the world is culture. This chapter will discuss how thinking or cognition is shaped by culture and, in turn, contributes to culture.

Despite different definitions in the literature (Borowsky, Barth, Schweder, Rodseth, & Stolzenberg, 2001), culture can be conceptualized as shared norms, customs, meanings, or understandings among people who also share a common language and life space. Culture and cognition are mutually constituted. On the one hand, culture shapes people's thinking styles and social cognition. On the other hand, people's cognition and behavior can also construct their culture through language, arts, traditions, customs, and religion. Thus, culture and cognition are mutually constitutive (Schweder, 1990).

In this chapter, we will first review evidence of how culture affects cognition (such

as attention and perception, categorization, memory, causal attributions, heuristics, and judgments and decision making), with a particular focus on contrasting holistic versus analytical cognitive styles among East Asians and European North Americans. Then, we will discuss how culture influences time-related judgments and decisions, how language is used in different cultures to reflect culture-specific cognitive styles, and how culturally specific cognition and beliefs are embodied in cultural environments and products. Finally, we will explore different assumptions and models accounting for cultural effects on cognition.

CULTURAL INFLUENCES ON COGNITION

Culture influences how people attend to the environment, perceive others, process information, and make judgments. One of the earliest studies that explored the relationship between culture and psychology demonstrated that even basic cognitions, such as perceptions, can be influenced by culture (Segall, Campbell, & Herskovits, 1966). Segall and colleagues (1966) conducted their research across 15 countries and demonstrated that people from different cultures differed in their susceptibility to

2 Culture and Cognition

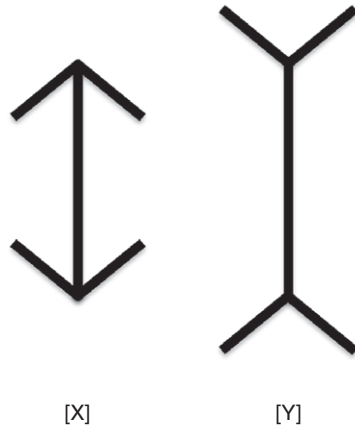


Figure 14.1 The Müller-Lyer illusion. Which of the two vertical line segments is longer, X or Y?

visual illusions, such as the Müller-Lyer illusion (see Figure 14.1). When asked to indicate which of the two line segments, X or Y, is longer, people tended to select segment Y. However, using a ruler to measure each line segment would quickly reveal them to be of equal length. Segall and colleagues found that Europeans were more susceptible to the Müller-Lyer illusion compared to other groups, such as the Zulu people, a tribe in South Africa. Segall et al. argued that such a difference may be related to differential experiences with corners in

eco-cultural environments (see Figure 14.2). The Zulu people have no perceptual experiences with corners because they live in a “circular culture”—in circular huts with arched doorways. In contrast, Europeans live in a “carpentered world” of rectangles and parallel lines and thus encounter corners of buildings every day. Therefore, the Zulu people are not as susceptible to the illusion as the Europeans are. These different ecological environments afforded people with different cues to perceive the world in slightly different ways.

The relationship between culture and cognition was further examined by Witkin and Berry (1975) through their research on field independence and dependence. According to Witkin and Berry, field independence is the tendency to rely on internal frames of reference and perceive focal objects as being discrete from the field. In contrast, field dependence is the tendency to rely on external frames of reference and perceive focal objects as being interconnected with contextual factors in the field as a whole. Berry (1966) found that the Temne, a sedentary agricultural group in Africa, were more field dependent than the Eskimos, a migratory hunting group in Canada.

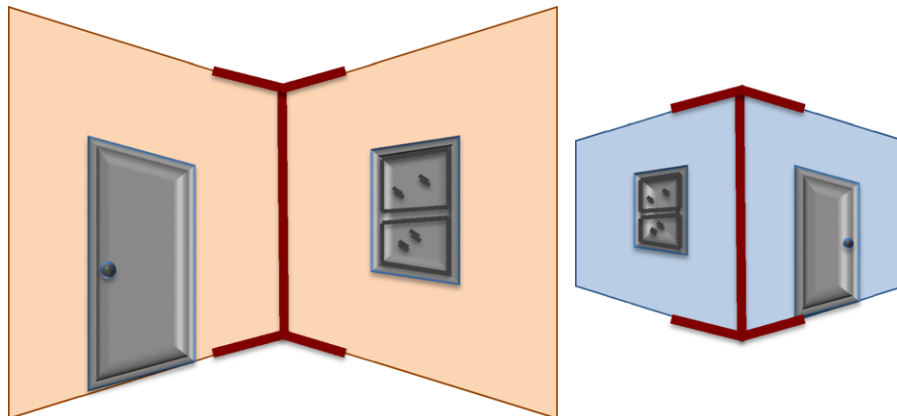


Figure 14.2 Experiences with corners of the buildings in our eco-cultural environments.

Holistic and Analytic Thinking Styles

Following Witkin and Berry (1975), Nisbett and colleagues provided the modernized conceptualization of culture and cognition (Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001). Based on research contrasting East Asian and European American thinking styles, Nisbett et al. (2001) proposed an influential theoretical framework in the discipline of culture and cognition. Specifically, they argued that East Asians (including Chinese, Japanese, and Koreans) tend to engage in holistic thinking, attend to the field as a whole, focus on the relationship between the focal object and its context, and view the world as interconnected, whereas European North Americans (including Americans and Canadians) tend to think analytically, focus on the focal object and its features, and view the world as being composed of independent objects, detached from the context. With this framework in mind, we will now review evidence demonstrating cultural differences in analytic and holistic thinking across various cognitive domains, such as attention and perception, categorization, memory, attribution, and judgments and decision making.

Attention and Perception

People from different cultures differ in the extent to which they pay attention to contextual information and the relationship between a given object and its context. One of the earliest studies showed that Chinese Americans tend to emphasize all aspects of a Rorschach test card (holistic way), whereas European Americans tend to emphasize certain focal aspects of the cards (analytic way; Abel & Hsu, 1949). Ji, Peng, and Nisbett (2000) examined cultural differences in field-dependence with the rod-and-frame test (Witkin et al., 1954). In this test, participants were presented with a frame that could be rotated independently of a rod. They were

then asked to make perceptual judgments about the position of the rod, while ignoring the frame. The authors found that East Asians (including Chinese, Japanese, and Koreans), compared to European Americans, made more mistakes while judging the position of the rod, indicating that they were more influenced by the frame (context) and were therefore more field dependent. In addition, having manual control of the test increased the performance and confidence of American (but not Chinese) participants. Kitayama, Duffy, Kawamura, and Larsen (2003) replicated and extended these findings using a frame-line task. Participants were presented with a square frame and a vertical line within it. Then, they were given another square of a different size and were asked to draw a vertical line in it. In the absolute task condition, they were told that the length of the line should be identical to the original vertical line (thus ignoring visual context). In the relative task condition, they were told that the line should have the same proportional relationship with the new square as the original line had with the original square (thus taking visual context into account). The results showed that Americans performed better on the absolute task, whereas Japanese performed better on the relative task. This suggests that the Japanese are better at incorporating contextual information, whereas Americans are better at focusing on the target, detached from its context.

The cultural differences in attention styles discussed earlier have also been shown to register in brain responses. Hedden and colleagues (Hedden, Ketay, Aron, Markus, & Gabrieli, 2008) assessed fMRI (functional magnetic resonance imaging) responses of 10 East Asians and 10 European Americans while having them work on the framed-line task, and found greater activation in the frontal and parietal brain regions among East Asians during the absolute task than

4 Culture and Cognition

during the relative task, and greater brain activation among European Americans during the relative task than during the absolute task. These brain regions are associated with attentional control. Thus, these results suggest that more mental effort is exerted when tasks involve cognitive processes that are less consistent with one's culture.

People from different cultures may also walk away with different information after watching the same scenes. Masuda and Nisbett (2001) presented Japanese and American participants with animated underwater scenes and then asked them to recall

what they had seen. In each scene, a few focal fish (large with salient colors) were moving in front of a background (seaweeds, rocks, and smaller fish; see Figure 14.3 for an example). Although there was no cultural difference in reporting the focal fish, Japanese participants reported the background and the relationship between objects and the background more often than American participants did. In a subsequent recognition task, participants were presented with either objects that had been previously seen in the underwater scenes or novel objects, and either with the original or a new background (see Figure 14.4).

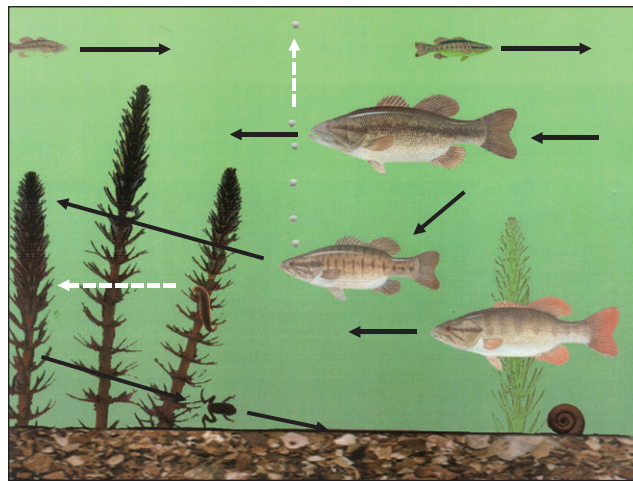


Figure 14.3 An example of the animated underwater scene with arrows indicating the directions of the movement of the figures in the scene.

SOURCE: From Masuda and Nisbett (2001). Reproduced with permission.

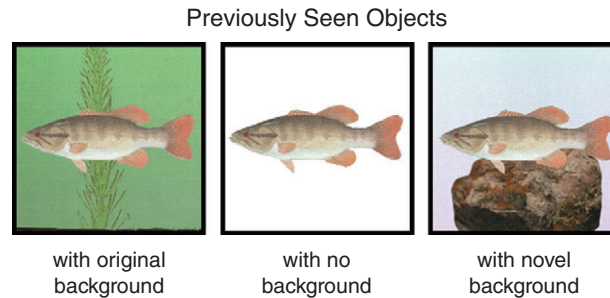


Figure 14.4 Examples of fragments of the underwater scene illustrating one of the focal fish with original, no, and novel background.

SOURCE: From Masuda and Nisbett (2001). Reproduced with permission.

They were then asked to indicate whether they had previously seen each of the presented stimuli. The researchers found that Japanese participants recognized the previously seen objects more accurately when the objects were shown with the original background than when the objects were presented with novel backgrounds. This suggests that Japanese participants attended to the objects together with their contextual environment as a whole. Americans' recognition, on the other hand, was less affected by the paired background, presumably because they decontextualized the objects from their background.

People from different cultures also differ in face perception. Miyamoto, Yoshikawa, and Kitayama (2011) replicated and extended Masuda and Nisbett's (2001) findings by examining whether Japanese and Caucasian Americans differ in their perception of faces. When perceiving faces, Japanese participants were more likely to take a configurative view and consider an overall gestalt of a person's face. In contrast, Americans were more likely to rely on feature-based processing and focus on individual facial features. In one study, Japanese and American participants were presented with images of two composite faces beneath a set of four faces. One of the composite faces was feature based

(i.e., putting parts of the four faces together), whereas the other was configure based (i.e., morphing the four faces together). Afterward, participants indicated which composite face was a better representation of the set of four faces. Compared to Americans, Japanese participants were more likely to select the prototypic configure-based face (i.e., based on overall resemblance to the four exemplars) than matching the features of the faces.

Masuda, Ellsworth, et al. (2008) examined whether East Asians actually allocate more attentional resources to contextual information than North Americans when judging a person's emotions. They presented Americans and Japanese with cartoon images depicting one central character surrounded by four others. These characters either expressed the same emotion (e.g., the central and surrounding characters looked happy) or different emotions (e.g., the central character looked happy while the surrounding characters looked sad or angry; see Figure 14.5 for an example). After viewing these pictures, participants judged the emotion of the central character. Compared to American participants, Japanese judgments of the central character's emotion were more influenced by the surrounding others' emotions. For example, Japanese participants judged the central character to be less happy



Figure 14.5 Examples of the cartoon images with the happy central figure surrounded by other happy (left) and sad (right) figures.

SOURCE: Image and graph from Masuda, Ellsworth, et al. (2008). Reproduced with permission.

6 Culture and Cognition

when he was surrounded by sad-looking (or angry-looking) others than when he was surrounded by happy-looking others, whereas Americans' judgment of the central character's emotion was much less affected by the emotions expressed by the surrounding others. The researchers also used an eye-tracker to assess participants' allocation of visual attention to the central and background figures. They found that in the first second of visual processing, both Japanese and Americans attended to the central figure, but in the seconds afterward, Japanese participants began to allocate their attention to the background figures, whereas American participants still focused on the central figure (see Figure 14.6). Japanese participants spent less time looking at the central figure, but allocated more attention (measured by eye gaze) to the figures in the background, reflecting their sensitivity to social contexts.

Further evidence of cultural differences in attention and perception comes from Chua, Boland, and Nisbett (2005), who presented Chinese and American participants with images depicting a target object (animals or nonliving things) on a relatively complex but realistic background, and tracked

their eye movements using a head-mounted eye-movement tracker. They found that American participants fixated on the focal objects sooner and for a longer duration than Chinese participants, whereas the latter made more eye saccades between the focal target and the background. Furthermore, in line with Masuda and Nisbett (2001), Chinese participants made more mistakes in recognizing previously encountered objects when they were presented on a new background than when they were presented on the original background, presumably because they processed the information about the object together with its background in a holistic manner.

East Asians' sensitivity to context also expands to a greater awareness of other people in their surroundings. Ji, Schwarz, and Nisbett (2000) proposed that Chinese people, who are more sensitive to social context, should have better knowledge than Americans about other people's observable behaviors. They asked Chinese and American participants to estimate the frequency of other people's observable behaviors (e.g., how often students go to the library per month, on average), using a high- or

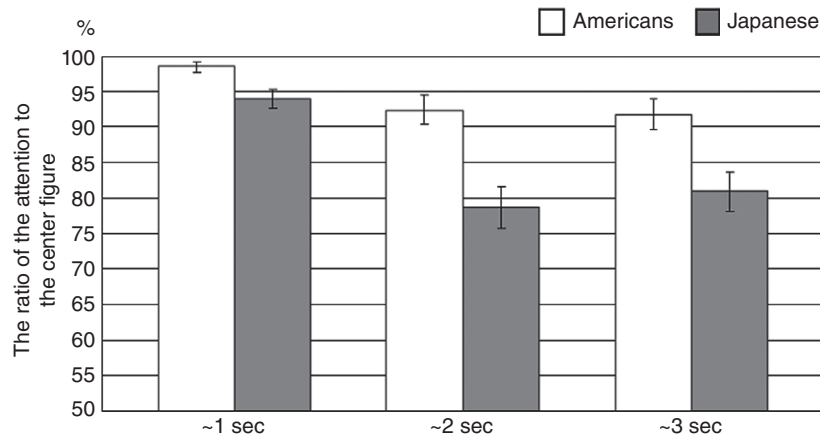


Figure 14.6 Graph illustrating the eye-tracking results of Japanese and American participants' attention to the central figure for the first 3 seconds of visual processing.

SOURCE: Image and graph from Masuda, Ellsworth, et al. (2008). Reproduced with permission.

low-frequency scale. To illustrate, a high-frequency scale started with less than 10 instances of engaging in a behavior and ended with 18 instances or more, whereas a low-frequency scale started with 0–1 instances and ended with 10 instances or more. They found that American participants estimated higher frequencies when responding to a high-frequency scale than to a low-frequency scale, indicating that they did not have a good idea about others' behaviors and therefore had to rely on the provided scale as a frame of reference to estimate others' behaviors. In contrast, Chinese participants' estimations (of others' observable behavior) were not influenced by the response scale, suggesting that they had better knowledge of these observable behaviors and thus did not need to rely on the scale in their estimation.

Categorization

Whether or not individuals attend to the context and relationships between objects may lead them to categorize objects in different ways. Chiu (1972) was one of the first psychologists who demonstrated this. He presented Chinese and American children with a series of images that depicted three items (e.g., a man, a woman, and a baby), and asked them to indicate which two items were alike or could go together. He found

that Chinese children were more likely to categorize the given objects, artifacts, plants, and human figures in terms of their relationships (e.g., putting woman and baby together because “mother takes care of the baby”), whereas American children were more likely to group the items based on their similarities (e.g., putting man and woman together because “both are adults”). Likewise, Ji, Zhang, and Nisbett (2004) replicated the same pattern of categorization between Chinese and American college students. For instance, when asked to choose two out of the three items (e.g., monkey, panda, and banana; see Figure 14.7) that were most closely related to each other, Chinese students tended to group objects based on their relationship (e.g., grouping monkey and banana together because “monkeys like to eat bananas”). Americans, on the other hand, tended to group objects based on their shared features or taxonomic similarities (e.g., grouping monkey and panda together because “both are mammals”).

Beyond thematic and taxonomic categorization, Norenzayan et al. (2002; Study 1) demonstrated cultural differences in rule-based versus exemplar-based categorization. Participants first learned and practiced the rule of categorizing fictional animals into two different categories (e.g., from Venus or Saturn). Then they were



Figure 14.7 A picture illustration of the categorization task.

SOURCE: Image created using text descriptions taken from Ji, Zhang, and Nisbett (2004).

8 Culture and Cognition

tested by being asked to categorize new animals based on the same rule. When the rule-based reasoning suggested an animal belonged to one category (e.g., Venus) but the exemplar-based (or overall-similarity-based) reasoning suggested it belonged to the other category (e.g., Saturn), significant cultural differences emerged: East Asian participants made more categorization errors than European Americans (and Asian Americans). The results indicate that categorization based on a formal rule is easier for Americans than for East Asians when the rule conflicts with overall similarities.

Memory

The way people organize or process information (e.g., categorization) has implications for memory. Indeed, when asked to remember a list of words (in their respective native languages), American participants were more likely than Chinese participants to recall words that belonged to the same category in succession even though words from various categories were presented to them in an intermixed order, presumably because Americans preferred to categorically process or organize the list of words more than Chinese did (Gutchess et al., 2006). Supporting this finding, Yang, Chen, Ng, and Fu (2013) examined cultural differences in memory for artificially defined categorical information, and found that Canadian participants (more analytic thinkers) outperformed Chinese participants (more holistic thinkers) in their memory for categorically processed information, whereas Chinese participants outperformed Canadian participants in memory for contextual information (Yang, Li, et al., 2013). These differential memory advantages reflect cultural differences in the way people attend to and process information.

North Americans' memory advantage for categorically processed information contributes to distortions in memory performance as well. In line with the previous findings, Schwartz, Boduroglu, and Gutchess (2014) found cultural differences in memory errors. The researchers first presented Americans (who are relatively more analytic) and Turks (who are relatively more holistic) with word pairs. Half of the word pairs contained categorically related words, whereas the other half of the word pairs contained categorically unrelated words. In the subsequent cued recall task, participants were given the first word of a pair as a prompt and were asked to recall its pair. Compared to Turks, American participants made more categorical-based memory errors by falsely recalling words that were taxonomically related to the prompt words (e.g., recalling the second word of the pair as *banana* or *fruit* when the prompt word was *pear*). Thus, relative to Turks, Americans used categorical strategies to organize information in memory and to retrieve information to a greater extent.

Cultural differences in context sensitivity also influence the encoding and retrieval of personal memories. Research shows that memories about one's own past differ across the Western (American and Canadian) and the Eastern (mainly Chinese and Korean) contexts (Q. Wang & Conway, 2004; Q. Wang & Ross, 2005). Specifically, Caucasian Americans' recall of their past experiences emphasizes their own roles as actors, as well as their own emotions. In comparison, East Asians' (i.e., Chinese and Koreans) recall of their past emphasizes significant others and their social interactions with them (Q. Wang & Conway, 2004; Q. Wang & Ross, 2005). Additionally, when recalling past incidents involving themselves at the center of the scene (e.g., giving an individual presentation or having a

conversation with a friend), Asians were more likely than North Americans to remember their experience from an observer's perspective (Cohen & Gunz, 2002). Accordingly, the same study also found that North Americans showed greater bias toward projecting onto others the emotions that they were experiencing themselves, whereas Asians showed a greater bias toward seeing in others the emotions that a generalized other (or observer) may have experienced. Similarly, Wu and Keysar (2007) reported that Chinese participants were better than Americans at perspective-taking.

Causal Attribution

Cultural differences in context sensitivity lead people to focus on different factors when explaining behaviors. Fundamental attribution error (FAE; Ross, 1977)—the tendency to explain human behaviors predominantly in terms of personal dispositions and to neglect important social and situational information—was assumed to be a universal phenomenon until Miller (1984) suggested otherwise. In Miller's study, participants were asked to describe prosocial and deviant behaviors of a person they knew, and to explain why the person behaved that way. She found that Americans explained others' behaviors in terms of their personal characteristics and dispositions (e.g., "That is just the type of person she is. She's very competitive"), whereas Hindus were more likely to attribute others' behaviors to social and situational factors (e.g., "The man is not employed. He is not in a position to give that money"). This cultural difference was more significant when participants provided explanations for deviant behaviors than for prosocial behaviors.

Consistent with Miller's (1984) finding, Morris and Peng (1994) also found cultural

differences between American and Chinese participants in their attributions regarding social events. In one study, participants saw an image of one target fish swimming in front of a group of fish, and were asked to explain why the target fish deviated from the others. Compared to American participants, Chinese participants were less likely to attribute the movement of the target fish to internal disposition (e.g., its leadership ability), and more likely to attribute it to external factors (e.g. being influenced by the other fish). Likewise, in another study, the researchers examined English and Chinese newspaper reports of similar crimes (e.g., mass murder), and found that American reporters made more dispositional attributions (e.g., "the man was mentally unstable"), whereas Chinese reporters referred more to situational influences (e.g., "the man followed the example of a recent mass slaying in Texas"). These findings were replicated in Lee, Hallahan, and Herzog's (1996) study, which compared sports articles published in Hong Kong and the United States. Likewise, Chiu, Morris, Hong, and Menon (2000) presented participants with a hypothetical situation in which a pharmacist incorrectly filled a prescription, causing several patients to fall ill. American participants were more likely to blame the pharmacist, whereas Chinese participants were more likely to attribute blame to the pharmacy as a whole.

Cultural differences in attribution between Americans and Asians are largely due to Asians' stronger situationism (i.e., belief that behaviors are best understood in its context), rather than Asians' lesser dispositionism (Choi, Nisbett, & Norenzayan, 1999). Indeed, correspondence bias—the tendency to infer corresponding dispositions from behaviors (Jones & Harris, 1967)—is an effect closely related to FAE that has been observed among Asians and Americans

10 Culture and Cognition

(e.g., Krull et al., 1999). In Choi and Nisbett's (1998) study, for example, both Koreans and Americans inferred that an essay writer's true attitude was consistent with what was argued in the essay, even when told that the essay writer was assigned to argue for one position regardless of his or her own attitude toward the issue. Only when the situational constraints were made more salient (e.g., by having participants go through what the essay writer allegedly had gone through), did Koreans make less correspondence inference. Americans, however, were not affected by such manipulation of situational salience and still thought that the essay writer's attitudes matched with the essay position. Using the same essay writing paradigm, Miyamoto and Kitayama (2002) found a weaker correspondence bias among Japanese than among Americans when the behavior was non-diagnostic (e.g., the essay writer wrote a relatively short and unpersuasive essay), but no cultural difference when the behavior was diagnostic of the essay writer (e.g., the essay writer wrote a relatively long and persuasive essay).

Compared to Americans, East Asians not only make more situational attributions, but also have more holistic and complex causal theories. Choi et al. (1999) argued that East Asians' causal theories are interactional, whereas Americans' theories are dispositional. Compared to Americans, East Asians tend to be more aware of the interactions between the person and the situation, and how multiple factors may be responsible for behaviors. Such a complex causal model may lead East Asians to consider a large pool of information before reaching a convincing causal account. Supporting such a hypothesis, Choi and colleagues (Choi, Dalal, Kim-Prieto, & Park, 2003) presented participants with many pieces of information that may help to understand a deviant or a prosocial behavior, and found that Koreans

took more information into consideration than Americans in explaining a behavior.

Cognitive Heuristics, Judgments, and Decision Making

Due to different thinking styles (as previously described), people from different cultures are differentially susceptible to various cognitive heuristics. Cognitive heuristics are mental shortcuts that people take when making judgments and decisions. Let's take the representativeness heuristic as an example. When making causal judgments, people tend to rely on the representative heuristic: judging the cause of an event based on its similarity (e.g., in magnitude) with the event (e.g., large causes lead to large effects, whereas small causes lead to small effects). Spina, Ji, Guo, Zhang, Li, and Fabrigar (2010) have shown that Euro-Canadian participants are more susceptible than Chinese participants to such heuristics, as they indeed expected greater correspondence in magnitude between the cause and effect of an event. For example, Euro-Canadians were more likely to associate a low-magnitude effect (e.g., disease outbreak that hospitalized some people) with a low-magnitude cause (e.g., a standard strain of bacteria) than with a high-magnitude cause (e.g., infectious strain of bacteria), and were more likely to associate a high-magnitude effect (e.g., disease outbreak that killed some people) with a high-magnitude cause than with a low-magnitude cause. Such a tendency was much weaker among the Chinese. Likewise, when presented with two pictures of tornados, one looking bigger than the other (see Figure 14.8), Euro-Canadians were more likely than Chinese individuals to believe that the bigger tornado would cause extensive damage and the smaller tornado would cause little damage (see Figure 14.9). In addition, when primed to think holistically, Euro-Canadians expected less cause-effect



Figure 14.8 An example of a wide tornado (left; high-magnitude cause) and narrow tornado (right; low-magnitude cause).

SOURCE: Image created using text descriptions taken from Ji, Zhang, and Nisbett (2004).

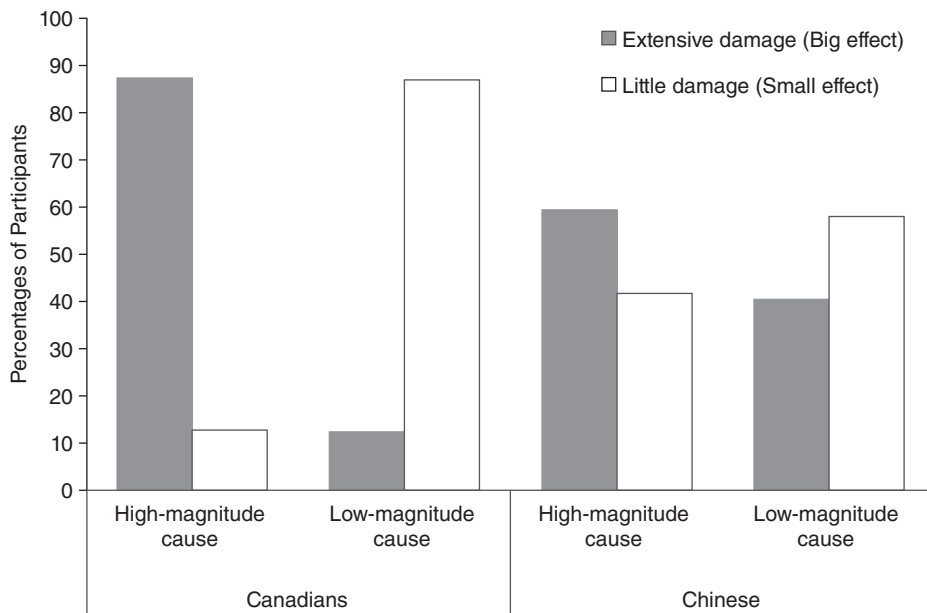


Figure 14.9 Graph illustrating the percentages of Canadians and Chinese associating the different magnitudes of the causes and effects of a tornado.

SOURCE: Image is taken from and graph is created using data from Spina, Ji, Guo, et al. (2010).

magnitude correspondence than when primed to think analytically, suggesting that cultural differences in people’s reliance on the representative heuristic to make casual judgments can be attributed to holistic-analytic thinking.

Chinese individuals are also more likely than Euro-Canadians to appreciate and understand regression toward the mean (Spina, Ji,

Ross, Li, & Zhang, 2010). Regression toward the mean refers to a phenomenon where extremely high or low deviations from the mean will tend to move toward the mean if the same events were to happen again, or be measured again. Across various domains, Spina, Ji, Ross, et al. (2010) demonstrated that Chinese participants tended to make

12 Culture and Cognition

predictions that took into account regression toward the mean more than Canadians did. For example, compared to Canadians, Chinese participants expected an athlete to show a greater improvement in performance after prior poor performance and a greater decline after prior great performance—assuming that the athlete had invested the same amount of effort each time. Moreover, when presented with a scenario that demonstrated regression toward the mean (e.g., an artistic director observed that every year, a few candidates she hired performed brilliantly at the audition but turned out to be only somewhat better than the others), Chinese participants were also more likely than Canadians to prefer and endorse a regression-consistent interpretation (i.e., *They probably just made some dance moves at the audition that were much better than usual for them*), even though they were less familiar than Canadians with the definition of *regression toward the mean*.

Culture-specific thinking styles also guide our judgment and decision making processes by governing what information we attend to, process, and evaluate, and how we go about doing so. In a recent study with MBA students and managers, Liang, Kale, and Cherian (2014) found that Chinese managers, compared to American managers, tended to make decisions that escalated their commitment to new products despite receiving poor performance reports. The authors suggested that this could be because Chinese managers, who tend to think more holistically, may see the future as being more dynamic and nonlinear, whereas American managers, who tend to think more analytically, may perceive the future as being more static and linear. As a result, holistic managers are more likely than analytic managers to consider other contextual information and place less emphasis on the current poor product performance when making product-related decisions. In addition to decision making in

organizational settings, when making online purchase decisions, Chinese individuals from Hong Kong, who endorse a holistic mode of thinking, were also more likely to attend to all available information (i.e., both important and less important), whereas European Canadians, who endorse an analytic mode of thinking, were prone to selectively focus only on information that was deemed important (Li, Masuda, & Russell, 2014).

Culture and Time

One major distinction between holistic and analytic thinking styles is the degree of attention to the context. Such contextual sensitivity applies not only to spatial information, but also to information along the temporal dimension. One could argue that the present is most likely the focus of attention as it is most immediate and salient, whereas the past and future tend to serve as the context for the present, as they are temporally further away. If East Asians are generally more sensitive to the context than North Americans, they may also attend to the past and future more than North Americans do, and that is exactly what research has shown.

East Asians, who endorse a more holistic thinking style than North Americans, attend to a wider breadth of temporal information while making predictions and decisions. Ji, Zhang, and Guo (2008) presented participants with hypothetical trends indicating the ups and downs of stock prices, and found that **North American participants tended to make predictions and decisions based on the most immediate/recent information provided in the trends**, whereas Chinese participants tended to make predictions and decisions based on the overall trends, indicating that the latter attended to a broader range of temporal information than the former. Likewise, Maddux and Yuki (2006) showed that

East Asians were more aware of the indirect and distal consequences of events. For example, when asked to list the perceived consequences of an area being turned into a national park, Japanese participants listed a larger proportion of indirect consequences of the event (that were further away from the critical event in time or location), compared to Americans. This effect was also found in an organizational context. When asked to imagine themselves being the president of a large company who had to downsize the company by firing employees and cutting salaries, compared to Americans, Japanese participants perceived this event as potentially affecting a greater number of people, and perceived themselves as more responsible for the indirect and distal consequences of the event (e.g., seeing themselves as responsible for the increased crime rate in the area a year later).

East Asians not only consider the future to be more relevant and connected to the present, but also perceive the past to be closely connected to the present. Ji, Guo, Zhang, and Messervey (2009) presented participants with a hypothetical detective case (e.g., money was stolen from a dormitory room), along with potential behavioral cues pertaining to the past or the present (e.g., *Three years ago, one student spent all her money on lottery tickets, or This afternoon, one student was out playing poker for money*). Chinese participants rated behaviors that took place in the remote or recent past to be more relevant in solving the case than did Canadians, whereas the two cultural groups did not differ in their ratings of the present behaviors. The same authors also found that Chinese participants recalled a greater amount of detail about past events, and perceived past events to be closer to the present than did Canadians. Altogether, these findings suggest that Chinese individuals attend more to past information and have a

greater awareness of the past and its relevance to the present.

Attending to a broader range of temporal information may facilitate East Asians' tendency to see changes over time. Indeed, lay theories or beliefs about how events develop over time vary across cultures (Ji, 2005). For example, European North Americans (including Americans and Canadians) tend to believe that people and events usually remain static, and if they do change, they change in a linear fashion—in the same direction and likely in the same rate. In contrast, Chinese participants tend to believe that people and events change courses over time, and that such change can be nonlinear and cyclical—the speed and direction of change can vary (e.g., life can change from being happy to unhappy, and then from being unhappy back to happy again; Ji, 2005). Ji, Nisbett, and Su (2001) presented American and Chinese participants with hypothetical scenarios, and asked them to predict the likelihood of an opposite future event taking place. They found that Chinese participants expected changes to be more likely to occur than Americans did. For example, compared to Americans, Chinese participants believed that it was more likely for “two kids fighting in kindergarten” to “become lovers” in the future, for a “chess champion with a winning streak” to “lose his next game” against his strongest opponent, for “a dating couple in college” to “break up” after graduation, and for “a child growing up in a poor family” to “become rich.” Similarly, when asked to choose a trend depicting life happiness from the beginning to the end of their life (see Figure 14.10), American participants chose linear trends (graphs A and B in Figure 14.10) more often than Chinese participants did, whereas Chinese participants chose nonlinear trends (graphs C and D in Figure 14.10) more often than American participants did. Taken together, these findings indicated

14 Culture and Cognition

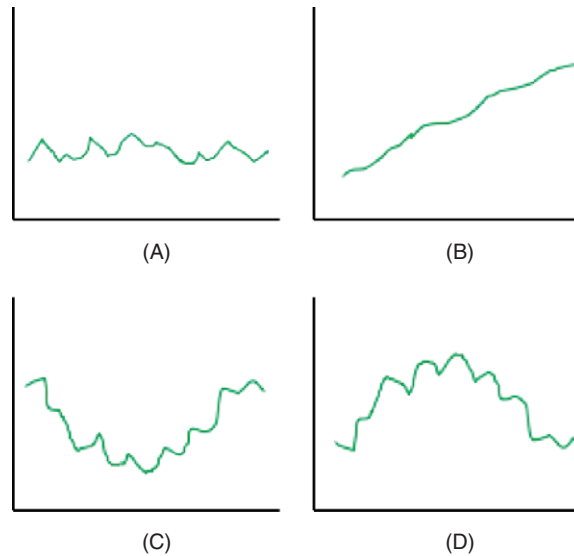


Figure 14.10 Some examples of linear (A and B) and nonlinear (C and D) trends that depict life happiness from the beginning to the end of life.

SOURCE: From Ji, Nisbett, and Su (2001). Reprinted with permission.

greater expectations among Chinese individuals than among Americans that their life happiness would likely change, and that happiness and unhappiness can transform into each other. Such a cultural difference in the lay theories of change were not found among 7-year-olds, but started to emerge among 9- and 11-year-olds (Ji, 2008), suggesting that lay theories of change are culturally learned. And these beliefs influence people's decision making. For example, Ji et al. (2008) found that, compared to Canadian and American students and individual investors, Chinese participants and individual investors indicated greater willingness to sell stocks that are increasing in price (as they expected their prices to drop in the future) and less willingness to sell stocks that are decreasing in price (as they expected their prices to go up in the future), as seen in Figure 14.11.

People from different cultures differ not only in how they perceive time and make time-related predictions, but also in how they value the past and future. Caruso, Gilbert,

and Wilson (2008) found that American participants attached more monetary value to an event in the future than an identical and equidistant event in the past. For example, when asked how much money they should be paid for 5 hours of data entry work that either would occur in one month's time or had occurred 1 month ago, the American participants reported that they should be paid more money for the work they would do in the future than the work they had done in the past. The authors suggested that this is likely due to greater emotional responses associated with anticipating the future (vs. reflecting the past), more intense emotions anticipated for the future (vs. emotions associated with a past event), and more vivid and intensive mental simulation associated with the anticipation of a future event (vs. in retrospection about an identical past event). Guo, Ji, Spina, and Zhang (2012) replicated these effects among Canadians, and further demonstrated cross-cultural differences between Canadian and Chinese participants.

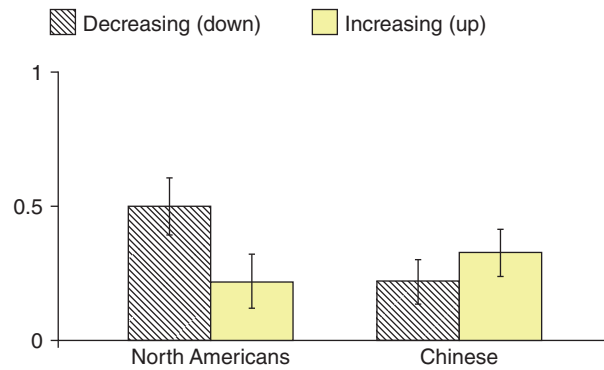


Figure 14.11 Graph illustrating North American and Chinese participants' decision to sell increasing and decreasing stocks (1 = yes, 0 = no).

SOURCE: From Ji, Zhang, and Guo (2008). Reprinted with permission.

More specifically, the temporal value asymmetry effect was reversed for both Chinese individuals and Chinese Canadians: They attached more monetary value to a past event than to an identical future event, presumably because they have a greater past than future orientation and tend to focus more on the past.

CULTURAL PRODUCTS AND PRACTICES

Culture and cognition are mutually constitutive. On the one hand, through socialization, institution, and social practice, culture provides the guidance and rewards that systematically shape individuals' cognition. On the other hand, culture arises from the participation of individuals, and therefore culture is constructed and modified by individuals' beliefs and behaviors (see Schweder, 1990, for a more comprehensive discussion). Our sociocultural world can be conceived as an artificial world populated with products of our own creation (Schweder, 1990). As a man-made part of the environment, culture cannot exist without our cognitive involvement, which gives culture meaning

(Schneider, 1984). In this section, we will discuss how culture-specific ideas and beliefs are embodied in the cultural environment and products that people create (for review, see Lamoreaux & Morling, 2012; Morling & Lamoreaux, 2008).

Language

According to Vygotsky (1978), cultural ideas and practices can become internalized through symbolic tools such as language (Y. Kashima & Gelfand, 2012). One might argue that language can be viewed as a cultural product, as it is the creation of a particular culture and it reflects cultural perspectives. For example, our cultural worldview about interpersonal relationships can be embodied in the language we use. Semin and Rubini (1990) examined the prevalence of different types of verbal insults (e.g., individualistic insults vs. relational insults) in different regions of Italy. They found that compared to people in individualistic cultures (e.g., northern Italy), people in collectivistic cultures (e.g., southern Italy) use verbal abuses and insults that are directed toward the target's relationships (e.g., *I wish you and your relatives all have cancer*) more frequently than

verbal insults that are directed toward the target individual themselves (e.g., *I hope you will be murdered*). Because verbal abuses usually involve denying people of what is most dear and central to them, these verbal insults can reflect how people with different cultural orientations construct the concept of a person or view relationships among people.

Language can also reflect culture through pronoun dropping. Across 39 languages in 71 cultures, E. S. Kashima and Kashima (1998) investigated the relationship between culture and language. They found that cultures whose main language (e.g., English) does not allow pronoun dropping (i.e., the use of subject pronouns in a sentence is obligatory) are more individualistic, whereas cultures whose language (e.g., Spanish, Japanese, and Chinese) allows pronoun dropping (i.e., does not require utterance of subject pronouns in a sentence) are less individualistic. For example, in English, it is not grammatically appropriate to drop the subject in *I have eaten*. However, in other languages such as Chinese, it is perfectly fine to drop the subject and say *have eaten*. The authors argued that the linguistic phenomenon of dropping the subject pronouns is associated with the psychological differentiation between the protagonist and the context. The obligatory use of the subject pronoun (e.g., *I*) reflects the importance of highlighting the target figure (e.g., the individual self or the other) from the surrounding context in the culture, whereas the optional use of it deemphasizes the figure-ground differentiation, and underlines the prominence of relationship between the self (or other) and the surrounding context in the culture. Therefore, the linguistic phenomenon of pronoun dropping provides a symbolic conceptualization of whether the culture emphasizes the contextualization or decontextualization of target figures (E. S. Kashima & Kashima, 1998; Y. Kashima & Kashima, 2003).

In another study, Na and Choi (2009) demonstrated that the use of the first-person pronoun *my* (*nae*) and *our* (*wuri*) differs between people with different social orientations within the same culture. Specifically, collectivistic Koreans were more likely to view themselves as being interdependent with others, and to use the first-person plural pronoun *wuri* when translating the word *my* from English to Korean because *wuri* signals interpersonal intimacy. Individualistic Koreans, on the other hand, were more likely to view themselves as being independent from others and to use the first-person singular pronoun *nae* in the same translation task. Furthermore, when the authors manipulated individualism (e.g., *Think about what makes you different from your family and friends*) or collectivism (e.g., *Think about what you have in common with your family and friends*) among Koreans, they found that participants primed with collectivism translated *my* to *wuri* more frequently than participants primed with individualism. Thus, the use of pronouns can reflect speakers' cultural orientations.

Other than the usage of pronouns, speakers from different cultures also use verbs and adjectives differently when describing people. According to the linguistic category model (Semin & Fiedler, 1988), adjectives are abstract and decontextualized, whereas verbs are less abstract and more contextualized. Adjectives provide a lot of information about the subject but very little information about the situation or the context the subject is embedded in. For example, *John is helpful* tells us more about *John* than the context he is in. The information provided by this statement is more abstract because it only says that John, in general, is a helpful person without any additional information about how or when or where. Verbs, on the other hand, provide more information about the social context the subject is embedded

in because verb phrases like *John helps* are often considered to be incomplete sentences. Hence, *John helps his grandmother* provides more concrete information about the situation and the relationship between the subject and the context. Maass, Karasawa, Politi, and Suga (2006) found that compared to Italians, Japanese were more likely to use behavior-descriptive verbs to describe a person. In contrast, Italians were more likely than Japanese participants to use trait adjectives to describe a person. This is presumably because Italians perceived others from a dispositional perspective and therefore spontaneously encoded information in trait adjective forms, whereas Japanese attended to the context when perceiving others, and therefore encoded information in the form of behavior-descriptive verbs. Further evidence comes from Morris and Mok's (2011) research, where they reported that after being primed with Asian culture, Asian Americans used more concrete verbs with contextual qualifications (e.g., A hits B) to describe social targets than abstract trait adjectives (e.g., A is aggressive), but showed the opposite pattern after being primed with American culture. Such differences in the preference for adjectives or verbs are also reflected in the corresponding bias in memory for social information: Italians made more memory errors as they falsely recalled more behavior-descriptive verbs as trait adjectives, whereas Japanese falsely recalled more trait adjectives as behavior-descriptive verbs (Maass et al., 2006). These findings are also in line with developmental literature demonstrating that nouns (more abstract) outpace verbs (less abstract) in early acquisition in English-speaking children, but such noun advantage was attenuated or absent among Chinese-speaking children (Tardif, 1996; Tardif, Gelman, & Xu, 1999). Thus, the effects of language are twofold. As a cultural product, language conveys cultural values

and culture-specific cognitive orientations. As a cultural agent, it perpetuates culture through its impact on its speakers.

Physical Environments

Cultural differences in cognitive styles (such as attention and perception) are also represented in the physical environments people build. Miyamoto, Nisbett, and Masuda (2006) randomly sampled pictures of scenes from small, medium, and large cities in the United States and Japan, and found that Japanese scenes were much more ambiguous and contained more elements than American scenes, which might encourage people to attend more to contextual information. Indeed, in a subsequent study, both Americans and Japanese attended more to context after seeing the Japanese scenes than after seeing the American scenes, suggesting that physical environments may afford culturally distinct cognitive styles.

Paintings and Drawings

Paintings and drawings are created by people from different cultures, representing different cultural perspectives. Additionally, some of these cultural products exert a great influence on people of future generations. Masuda, Gonzalez, Kwan, and Nisbett (2008) compared traditional East Asian art and Western art in representative museums, and found that the horizons in East Asian landscape paintings were significantly higher than those in Western landscape paintings, thus including more contextual or field information. East Asian portraits also tended to deemphasize the face and thus included more contextual information, compared to Western portraits. In addition, when asked to draw a landscape picture or take a photo, East Asians included more contextual objects than Americans did. Indeed, such cultural differences emerge as

early as in Grade 2. Senzaki, Masuda, and Nand (2014) asked Canadian and Japanese children from Grade 1 to Grade 6 to draw a landscape picture or to produce a landscape collage using ready-made items, and found that children in each culture gradually developed expressions unique to their culture: There was no cultural difference in Grade 1, but starting from Grade 2, Japanese children placed the horizon higher in a picture and included more items in a landscape collage than their Canadian counterparts.

Social Media

People from different cultures not only differ in their depiction of other people or objects, but they also differ in how they present themselves on social media and in public. Huang and Park (2013) analyzed photographs on Facebook profiles and found that East Asian Facebook users are more likely to deemphasize their faces and to include more contextual information in their profile photographs, whereas American Facebook users tend to emphasize their faces instead of the background. Americans also tended to show greater smile intensity on their profile photos than their East Asian counterparts. H. Wang, Masuda, Ito, and Rashid (2012) gathered poster presentations at a major psychology conference and found that East Asians' posters tended to include more information (with more words) than Americans' posters. They found the same pattern with government and university portal pages: East Asian pages had shorter scroll bars (i.e., longer pages) and contained more links, words, and bytes than American pages.

HYPOTHESIS AND MODELS OF CULTURE AND COGNITION

The preceding sections have elucidated cultural differences across a wide range of

cognitions, as well as discussed how culture-specific cognitions can manifest and be reinforced in our cultural practices and products. But why do people from different cultures think differently? What factors have led to or contributed to cultural differences in cognition? Cultural psychologists have investigated these questions from multiple perspectives. Some have explored the issue from a more distal (such as the impact of Ancient philosophical traditions; settlement history in the past) and macro (e.g., pathogen prevalence in the region, tightness of the culture) perspective, whereas other researchers have explored the issue from a relatively more proximal angle (e.g., social orientation or social class of the individual). In the following section, we will first discuss the social orientation hypothesis, which has received the most support as a proximal explanation for cultural differences in cognition. We then explore other theoretical models, which use different perspectives to address why cultures differ in their social orientations (and subsequently cognitive styles).

Social Orientation Hypothesis

The social orientation hypothesis posits that differences in social orientation (i.e., social interdependence and independence) can account for cultural differences in cognitive styles, such as holistic and analytical thinking (Markus & Kitayama, 1991; Nisbett et al., 2001; Varnum, Grossmann, Kitayama, & Nisbett, 2010). Cultures that endorse interdependent social orientations are more likely to emphasize the interconnectedness and relatedness among individuals in the society, and place more importance on fostering harmonious relationships with the interconnected others. On the other hand, cultures that endorse independent social orientations are more likely to emphasize the uniqueness and self-reliance of the individual in

the society, placing more importance on asserting and expressing one's self. Research has shown that people in interdependent cultures tend to think holistically, and people in independent cultures tend to think analytically. For example, East Asians are more interdependent and also display more holistic patterns of thinking, whereas North Americans are more independent and display more analytic patterns of thinking (Nisbett et al., 2001). Likewise, Russians or Croats, who are relatively more interdependent than Americans or Germans, are more holistic in the way they form categories, attend to visual stimuli, and make situational attributions, compared to Americans or Germans (Grossmann, 2009; Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998; Medzheritskaya, 2008; Šverko, 1995; Varnum, Grossmann, Katunar, Nisbett, & Kitayama, 2008).

So far, a majority of the discussions about cultural differences in cognition have been focused on between-country comparisons. The association between social orientation and cognitive styles, however, can also exist when examining people from the same geographic area or those who share common history and language. Take Italy as an example. Due to the complex historical processes, northern and southern Italy are characterized by different social orientations. Knight and Nisbett (2007) found that southern Italians, who are relatively more interdependent, preferred to reason more holistically and categorize items based on thematic relations compared to northern Italians, who are relatively more independent. Likewise, Kitayama and colleagues (2006) found that Hokkaido Japanese, who are more independent than mainland Japanese, made more dispositional instead of situational attributions than the mainlanders. We will highlight more of these within-country differences in the later sections.

Evidence from priming research provides strong support for the causal relationship between social orientations and cognitive styles. Research has shown that priming interdependence can promote holistic thinking, whereas priming independence can promote analytic thinking (Kühnen, Hannover, & Schubert, 2001; Oyserman & Lee, 2008). For example, Oyserman, Sorensen, Reber, and Chen (2009) primed interdependence or independence among people from various cultures (including Koreans, Hong Kong Chinese, and European Americans) by asking participants to circle plural or singular pronouns in a paragraph of text. Afterward, researchers presented participants with an image of multiple objects laid out in a random array, and later asked participants to recall as many of the objects as they had seen by writing the names of the objects or drawing the objects in the correct area/location on an empty grid. The authors found that individuals primed with interdependence focused on the picture as an integrated whole and recalled the spatial locations of objects in the picture better than individuals primed with independence. Similarly, in a target identification task, when participants were asked to identify if a defined target figure was present or absent in the midst of other figures, individuals primed with independence were faster than those primed with interdependence at recognizing whether the specific target was present or absent, presumably because independence-primed individuals disregarded the context of the whole image to a greater extent, compared to interdependence-primed individuals. Research involving bicultural individuals has also shown that biculturals adjust their thinking styles depending on which cultural cues are made more salient (Hong, Benet-Martínez, Chiu, & Morris, 2006). For instance, Morris and Mok (2011) showed Asian Americans either Chinese books with

images illustrating Asian culture on their covers (Asian culture prime) or American books with images illustrating American culture on their covers (American culture prime) before asking them to describe some social targets (e.g., provide descriptions of a person or a group they knew but not very well). Asian Americans primed with Asian culture used more concrete (e.g., verbs) and less abstract (e.g., trait adjectives) linguistic categories to describe social targets, compared to those primed with American culture. Thus, by making certain social or cultural orientations salient through priming, we can observe different cognitive styles among people.

If cultural differences in social orientations account for cultural differences in cognitive styles, what could have accounted for these cultural differences in social orientations in the first place? Researchers have suggested that differences in individuals' social orientation could originate from philosophical traditions, social class, and ecological environment. Next, we discuss each of these perspectives in more detail.

Philosophical Traditions

Philosophical traditions vary across cultures. They provide individuals with different tools to comprehend the world (Nisbett, 2003). Western cultures are more influenced by ancient Greek philosophy, whereas Eastern Asian cultures are more influenced by ancient Confucian philosophy (Lloyd, 1996). One important difference between these ancient philosophical traditions is their emphasis on personal agency versus social relationships. Ancient Greeks emphasized personal agency and choice so much so, that they defined happiness as an "exercise of vital powers along lines of excellence in a life affording them scope" (Hamilton, 1930/1973, p. 25).

In contrast, Confucianism advocates collective agency and places emphasis on social relationships and in-group harmony. Social relationships define one's roles and duties. In order to achieve or maintain social harmony, everyone needs to know their place and fulfill their respective duties. If needed, people should suppress personal desires for the greater good of the group and/or to minimize friction with others (Nisbett, 2003). Although not all members of a culture follow the predominant philosophical traditions, these different philosophical traditions no doubt have contributed to social independence in the West and social interdependence in the East, which further led to cultural differences in cognitive styles.

Social Class

Variations in social orientation and cognitive styles have been found between individuals from different social class groups within the same culture (Bowman, Kitayama, & Nisbett, 2009; Knight & Nisbett, 2007; Kraus, Piff, & Keltner, 2009; Na et al., 2009). Social class is often associated with resources and ranks within a social hierarchy; people of a lower social class have relatively fewer social and material resources than people of a higher social class (Bowman et al., 2009; Kraus et al., 2009). With relatively scarce resources, lower class individuals are less self-reliant and more likely to form extensive networks of relationships with others, and are thus more interdependent for support and resources, as compared to higher class individuals (Stephens, Markus, & Townsend, 2007). This is somewhat in line with the modernization hypothesis, which advocates that communities that are more urban, capitalistic, industrialized, and wealthy are more independent than communities that are more rural, more agricultural, and less wealthy

(Greenfield, 2009). Indeed, compared to individuals of a higher social class, individuals of a lower social class tend to attribute behaviors to situational factors, and are more likely to form categorizations based on thematic relationships (Knight & Nisbett, 2007; Krauss et al., 2009). Thus, social class seems to have contributed to different cognitive styles through individuals' social orientations.

Ecology and Environment

The ecological environment also shapes social interactions among people, which can then influence cognition and behavior (Berry, 1975, 1976; Berry et al., 1997; Witkin & Berry, 1975; see also Triandis, 2007). Berry (1966) found that individuals in a sedentary agricultural group (such as Temne) emphasized compliance and strict child-rearing practices, whereas individuals in a migratory hunting group (such as Eskimos) emphasized self-assertion and personal autonomy in their child-rearing practices. As a result, their cognitive styles also differed: Individuals in the Temne of Sierra Leone were more field-dependent than Eskimos were (see also Dawson, 1967a, 1967b).

Ecological and economic structures play an important role in shaping social interaction processes that are adaptive for successful navigation in the environment. For example, in Turkey's eastern Black Sea region, the farming, fishing, and herding communities differ in their economic structure. The different economic activities that individuals in these regions engage in eventually shape their social interactions with each other: Farmers or fishermen tend to rely more on families and their fellow villagers for economic success, and as a result their community advocates cooperation and harmonious social interdependence. In contrast, the neighboring herders rely less on others for

economic success, and as a result, the herding community advocates social independence and individual decision making (Uskul & Over, 2014). These differences in ecological and economic structures shape individuals' social orientations, which then influence their cognition: Turkish farmers and fishermen displayed more holistic patterns of attention, reasoning, and categorization than their neighboring Turkish herders (Uskul, Kitayama, & Nisbett, 2008).

Likewise, the rice theory also posits that different ecologies or methods of subsistence endorsed by a given community, such as growing rice or growing wheat, can shape different social and cognitive orientations of those residing in the same country or sharing the same nationality/ethnicity (Talhelm et al., 2014). Compared to wheat farming, rice farming requires much more coordination and cooperation among neighbors to achieve economic success or advantage because the technique is very dependent on an elaborate irrigation system that requires a lot of effort to build and maintain. In addition, rice farmers rely more heavily on each other's help during the harvesting period than wheat farmers do. As such, societies that farm rice are typically more socially interdependent, whereas societies that farm wheat are typically more socially independent. Consistent with this theory, people from the rice-growing regions of China are found to be more interdependent and are more likely to form categories holistically (or thematically) than people from the wheat-growing regions of China (Talhelm et al., 2014).

The voluntary settlement at the frontiers has also been speculated to be another explanation for social independence among people who lived in there. The voluntary settlement hypothesis suggests that voluntary settlers who immigrated to the frontiers were more likely to endorse independent agency

than people who chose not to move to the frontiers. This is likely because the cultural environment and living conditions at the frontier were structured in a way that fosters independence and self-reliance (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006; Kitayama & Uchida, 2005; Markus & Kitayama, 2004). Thus, compared to the people who did not move to the frontiers, voluntary settlers were more independent, goal oriented, and self-reliant, presumably because they were more economically motivated to self-promote and self-protect in order to successfully navigate the new and harsh frontier life.

In addition to these ecological, social, and economic factors, threats posed by infectious disease pathogens can also partly account for cultural differences in social orientations, which further contributed to cultural differences in cognition. According to the pathogen prevalence theory, cultural differences in cognitions and social orientations are contingent on the prevalence of pathogenic diseases in one's ecology (Fincher, Thornhill, Murray, & Schaller, 2008). The basis of this argument is that psychological outcomes and social behaviors are a function of an antipathogen defense (Faulkner, Schaller, Park, & Duncan, 2004; Park, Schaller, & Crandall, 2007). Fincher and colleagues (2008) found that historical prevalence of pathogens is highly correlated with cultures that are more collectivistic and interdependent, even after controlling for other predictors like GDP (gross national product). Further support comes from an investigation by Murray, Trudeau, and Schaller (2011), who found that cultures that have favorable ecological conditions for infectious-disease-causing pathogens are more likely to promote conformity to social norms than cultures without such historical prevalence of pathogens. This is because conformity to cultural and social norms (e.g., minimizing

interaction with foreigners/strangers and not deviating from normative food preparation, etc.) in these pathogen-prevalent environments can help reduce the risk of getting unnecessary infections and buffer against the risk of pathogen transmission.

Besides pathogen prevalence, many other ecological, historical, or human-made threats (e.g., scarcity of resources, vulnerability to natural disasters, etc.; see Gelfand, 2012, for a review) can lead to the "tightness" and "looseness" of a culture, which in turn shapes the social behavior and psychological processes of the individuals within said culture. According to Pelto (1968), the tightness and looseness of a society is characterized by the presence of clearly defined norms and people's adherence to the social norms. Cultures and societies that are tight have many clearly defined norms, low tolerance for deviation, and severe sanctions for transgressors. In comparison, cultures and societies that are loose have less clearly defined norms, high tolerance for deviation, and less harsh/strict disciplinary actions for transgressors. These different emphases, qualities and behavior tendencies are presumably adaptive for survival in the respective ecocultural environments. For example, Barry, Child, and Bacon (1959) demonstrated that sedentary agricultural societies that require lots of effort and labor (e.g., planting and harvesting crops) not only have very well-defined rules and regulations, but they also emphasize strong conformity to the social norms. The importance of compliance and coordination in such tight cultures increases their chances of survival, and eventually fosters more social interdependence with each other. On the other hand, loose cultures—such as the more mobile hunting and fishing societies—foster social independence because they require less clearly defined orders and coordination for successful adaptation (Lomax & Berkowitz, 1972).

In a nutshell, people develop orientations of independence or interdependence that are adaptive for their social eco-cultural environment. Such social orientations are likely to be maintained and reinforced by the community, influence individuals' cognition and behavior, and then in turn contribute to the social and cultural environments.

CONCLUSION

This chapter summarizes recent advancements in culture and cognition research, reviews evidence of culturally impacted cognition, highlights culture-specific cognition and beliefs as embodied in the cultural environment and cultural products, and explores theoretical models accounting for cultural differences in cognition and social orientation. Next, we suggest some directions for future research.

First, researchers need to study a wider range of cultures and regions (and even religions), going beyond North Americans and East Asians, in order to fully understand the relationship between culture and cognition. Increasing research suggests that North Americans, instead of being the norm, may be the outliers when compared to people from many other places (see Henrich, Heine, & Norenzayan, 2010, on WEIRD people). Therefore, expanding the scope of cultural research beyond a North American-centered approach is not only useful, but also imperative.

Second, the world is brought closer together as a result of technological advances. Societies and cultures are evolving with the ever-changing economy and social-political systems. Will globalization lead to more convergence in cognition among cultures, or will it lead to more differences between cultures? It will be exciting, albeit challenging, to examine how these cultural and societal

changes may influence the predominant cognitive styles within and across cultures.

Third, cultural differences in cognition are not static—they are indeed moderated by a variety of factors, such as affect, context, and situational priming (e.g., Koo, Clore, Kim, & Choi, 2012). It is important to investigate under which circumstances cultural differences are salient and under which circumstances they are less significant, which will help us better understand the mechanisms, moderators, and boundary conditions for the effects of culture on cognition.

Finally, with the technological and methodological advancements in the field and beyond, researchers should be open-minded and creative in their methodological approaches, as well as in the topics or issues of investigation. The physiological, neuroimaging, and genetic approaches, for example, when used wisely, can complement behavioral approaches in providing insight into the multiplex relationship between culture and cognition.

To conclude, people acquire a complex set of values and beliefs from their environment, cultural history, traditions, and social practice. Culture shapes what we attend to and learn, as well as how we think and process information. These culturally specific cognitions, in turn, shape the cultural environment and products we create. Hence, understanding the reciprocal relationship between culture and cognition is essential and has far-reaching implications.

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24 Culture and Cognition

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26 Culture and Cognition

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