Culture and Analytic Versus Holistic Cognition: Toward Multilevel Analyses of Cultural Influences

Yuri Miyamoto
Department of Psychology, University of Wisconsin-Madison, Madison, Wisconsin, USA

Contents

1. Cultural Differences in Analytic Versus Holistic Cognition 133
   1.1 Cultural differences 134
   1.2 Moderators of cultural differences 145
   1.3 Summary 148
2. Multilevel Analyses of Cultural Influences on Cognition 148
   2.1 Distal-level situational factors 149
   2.2 Proximal-level situational factors 152
   2.3 Individual-level factors 160
   2.4 Summary 162
3. Culturally Contingent Situated Cognition: A Case for Cultural Moderation of a Proximal-Level Situational Factor 163
   3.1 Cognitive consequences of power in Western cultures 164
   3.2 Culturally contingent cognitive consequences of power 170
   3.3 Summary 178
4. Implications and Future Directions 178
References 180

Abstract

A growing body of literature has documented cultural differences in cognitive processes and also proposed various factors underlying these cultural differences. At the same time, not much attention has been paid to proximal-level processes that connect distal-level societal factors to individuals’ cognitive processing. This chapter aims to present a framework to integrate factors at multiple levels to understand cultural influences on cognitive processes. The chapter begins by providing an overview of cultural differences in cognitive processes, including potential moderators of cultural differences. Next, factors underlying cultural differences at multiple levels are outlined, with a focus on proximal-level situational processes. Subsequently, by introducing the case of
culturally contingent consequences of power, the chapter illustrates how cultural contexts can moderate the effect of a certain factor on cognitive processes, highlighting the importance of multilevel analyses. Implications of multilevel analyses and directions for future research are discussed at the end.

Studies on cross-cultural differences in cognitive processes have been rapidly accumulating over the past decade (Nisbett, 2003; Nisbett & Miyamoto, 2005; Nisbett, Peng, Choi, & Norenzayan, 2001). These studies have demonstrated cultural differences across a wide range of cognitive processes, including processes which used to be considered universal. For example, although studies done in Western cultural contexts have repeatedly shown a robust tendency for people to overestimate internal causes and underestimate external causes of behavior (i.e., the fundamental attribution error; Ross, 1977), such a tendency has been found to be attenuated or nonexistent in Asian cultural contexts (e.g., Miller, 1984). Demonstrations of cultural differences in cognitive processes highlight the crucial role that sociocultural contexts play in shaping the nature and function of cognitive processes.

As is often the case in social psychological research (Zanna & Fazio, 1982), however, questions guiding cross-cultural research have evolved over the past decades (Heine & Norenzayan, 2006). First-generation questions asked “Is there a cultural difference?” and these led to the accumulation of evidence showing cultural differences in cognitive processes, such as the studies that showed cultural differences in the fundamental attribution error. Second-generation questions built on findings of cultural differences and probed, “When is there such an effect?” (i.e., under what conditions) or “How does the effect occur?” (i.e., through what processes does culture shape psychological experience). For example, researchers who asked the second-generation questions have shown how cultural differences in attribution depend on moderating conditions, such as situational salience (e.g., Choi & Nisbett, 1998), and how the way people view the self can shape their cognitive processes (e.g., Kühnen & Oyserman, 2002).

At the same time, even though “when” and “how” questions are closely related to each other, they have rarely been asked simultaneously. While too much emphasis on “when” questions can lead to a relatively dispersed understanding, exclusive focus on “how” questions can reduce the rich sociocultural phenomena too much (Zanna & Fazio, 1982). To integrate “when” and “how” questions into a single framework, this chapter proposes the importance of taking into account factors at multiple levels to understand
cultural influences on cognitive processes, especially by highlighting proximal-level processes through which distal-level societal factors influence and shape individuals’ cognitive processes.

Section 1 delineates the nature and scope of cultural differences in cognitive processes by providing an overview of cultural differences in cognitive processes and also reviewing potential moderators of cultural differences. Section 2 outlines multilevel analyses of factors underlying cultural differences by highlighting proximal-level situational factors that bridge the gap between distal-level situational factors and individual psychological factors. Section 3 illustrates how the effect of a proximal-level factor can depend on distal-level factors by introducing studies on culturally contingent consequences of power. Both throughout the chapter and at the end, implications and issues that need to be addressed in future research are discussed.

1. CULTURAL DIFFERENCES IN ANALYTIC VERSUS HOLISTIC COGNITION

Although there are various ways in which cognitive processes can differ across individuals and sociocultural environments (e.g., Müller-Lyer illusion; Segall, Campbell, & Herskovit, 1966), one of the most well-documented cognitive processes that differ across cultures is the extent to which people attend to contextual and relational information (Miyamoto & Wilken, 2013; Nisbett, 2003; Nisbett & Miyamoto, 2005; Nisbett et al., 2001; Witkin, Dyk, Faterson, Goodenough, & Karp, 1974). For example, when presented with a picture of a wolf standing in woods, some people focus on the focal object (i.e., the wolf) without paying much attention to its context (i.e., the woods), whereas other people attend to relationships between the focal object and its context (Masuda & Nisbett, 2001). Also, when explaining why someone engaged in a certain behavior (e.g., cheating behavior), some people tend to attribute the cause to the actor’s internal attributes (e.g., competitive personality), whereas other people tend to attribute the cause to contextual factors surrounding the actor (e.g., unemployment; Miller, 1984). The cognitive style of people who focus on an object independently from its context and categorize and explain things based on attributes of the object has been called analytic or field independent. In contrast, the cognitive style of people who attend to relationships between a focal object and its contexts and categorize and explain things on the basis of such relationship has been called holistic or field interdependent.
Researchers have suggested that analytic and holistic cognitive styles are closely associated with characteristics of sociocultural environments at a distal level (Fiske, Kitayama, Markus, & Nisbett, 1998; Nisbett, 2003; Nisbett et al., 2001; Varnum, Grossmann, Kitayama, & Nisbett, 2010). In particular, in sociocultural environments characteristic of North America or Western Europe, individuals are considered to be fundamentally independent from social relationships, whereas in sociocultural environments characteristic of East Asia, individuals are considered to be inherently connected to and embedded in social relationships (Markus & Kitayama, 1991; Triandis, 1989). It has been theorized that, in the former, independent sociocultural environments, individuals tend to focus on their own goals and their target objects without being too much influenced by surrounding others’ demands or contexts, which leads to an analytic cognitive style. In contrast, in the latter, interdependent sociocultural environments, it is theorized that individuals need to attend to relationships and contexts, which leads to a holistic cognitive style.

In this section, I will review evidence demonstrating cultural differences in analytic versus holistic cognition and potential moderators such cultural differences. Most of the studies introduced in this section compare a sample from Western cultures (e.g., North America, Western Europe) with a sample from East Asian cultures (e.g., China, Korea, and Japan) because those two cultures differ from each other on the critical distal-level situational factors (i.e., independent vs. interdependent social structures) assumed to underlie cultural differences in cognitive processes. In addition, comparisons of Western and Eastern cultures have the benefit of allowing researchers to examine cultural differences in cognitive processes while controlling for other factors, such as the level of economic development or modernization. At the same time, it is important to note that cognitive differences are not confined to East–West differences. As will be reviewed in the subsequent section, studies have found that cognitive differences exist between other sociocultural environments that are assumed to differ in terms of independent versus interdependent social structures, such as other regions of the world (e.g., Eastern Europe, West Africa, Northern vs. Southern Italy), religions (e.g., Protestants, Catholic), and social classes (e.g., working-class, middle-class).

1.1. Cultural differences

1.1.1 Attention

One of the core features of analytic and holistic cognition is attention to focal versus contextual information in a visual field. In a pioneering study of cultural differences in attention, Masuda and Nisbett (2001) presented
American and Japanese participants with animated video clips of naturalistic underwater scenes containing focal fish within a background and asked them to describe the scenes. Japanese participants were more likely than American participants to refer to the background and to relationships between focal fish and the background (e.g., “a big fish was swimming toward the green seaweed”). Such cultural differences have also been shown in eye movements. When watching still photos of naturalistic scenes containing a focal object and its background (e.g., a tiger in a jungle), American participants looked at the focal objects sooner and longer than Chinese participants did, and Chinese participants made more saccades to the background than American participants did (Chua, Boland, & Nisbett, 2005). These studies suggest that Westerners and East Asians are actually looking at different things when they are exposed to naturalistic scenes.

Although these findings provide evidence for the existence of cultural differences in attention, such findings could be driven by differences in meanings people ascribe to animals or naturalistic scenes. If there were cultural differences in attention to stimuli stripped of any potential meanings, it would provide stronger evidence for cultural differences in attention. In fact, many studies have found cultural differences using simple geometric figures (e.g., Doherty, Tsuji, & Phillips, 2008; Ji, Peng, & Nisbett, 2000; Kitayama, Duffy, Kawamura, & Larsen, 2003; McKone et al., 2010; Savani & Markus, 2012; Witkin et al., 1954). For example, the Framed-Line Task (FLT; Kitayama et al., 2003; Figure 3.1) measures the ability to incorporate or ignore contextual information (i.e., square frame). Participants were first shown a

![Figure 3.1 An illustration of the Framed-Line Task (Kitayama et al., 2003).](image-url)
square frame with a vertical line in it and then presented with another square frame of either the same or a different size. In the second square, participants were asked to draw a line that was identical to the first line in either absolute (i.e., absolute task) or relative (to the frame) length (i.e., relative task). Thus, the absolute task required attention to the length of the focal line independently from the contextual frame, whereas the relative task required attention to the relationship between the focal line and the contextual frame. Japanese participants tended to make more errors in the absolute task compared to American participants, whereas American participants tended to make more errors in the relative task compared to Japanese participants. Furthermore, a functional magnetic resonance imaging (fMRI) study showed that working on culturally incompatible tasks (i.e., the relative task for Americans and the absolute task for East Asians) increased activation in regions of the brain associated with attentional control compared to working on culturally compatible tasks did (Hedden, Ketay, Aron, Markus, & Gabrieli, 2008), suggesting that the culturally incongruent task is more challenging.

These cross-cultural results suggest that East Asians are more likely than Americans to attend to contextual information when perceiving visual stimuli that include focal objects and their contexts. Do such cultural differences in attention to contextual information extend to attention to configural relationships between objects? Because configural relationships between objects provide context in which each object is located, East Asians may be more likely than Americans to attend to such relationships. By focusing on facial perception, a domain characterized by configural processing (Farah, Wilson, Drain, & Tanaka, 1998), Miyamoto, Yoshikawa, and Kitayama (2011) examined whether East Asians are more sensitive to changes in spatial (configural) relationships between facial features than Americans are. Two sets of faces were created from original faces: the spacing set was created by changing spacing between the features (i.e., the eyes and the mouth) and the featural set was created by replacing the eyes and mouth with those of other faces (see Figure 3.2; Mondloch, Le Grand, & Maurer, 2002). Both Caucasian and Japanese faces as well as female and male faces were used. Participants worked on an identity-matching task where they were presented with two faces sequentially on a computer screen and were instructed to judge whether the two faces were the same or different as accurately and as quickly as possible. The proportion of correct responses was computed for the featural set and the spacing set.

As predicted, an interaction between face set and culture was significant. Although both American participants and Japanese participants performed equally well in the featural set, Japanese participants were more accurate than
were American participants in the spacing set (see Figure 3.3). In addition, Americans were slower to respond regardless of the type of changes when compared with Japanese, suggesting that cultural differences in accuracy in the spacing set were not due to speed-accuracy trade-offs. Furthermore, after completing the identity-matching task, participants were asked to report the extent to which they focused on various aspects of face. In line
with their performance on the identity-matching task, Japanese participants reported attending more to configural aspects, such as configuration and impression, than American participants did. To further explore the effect of culture on cognition, Asian participants in the United States were also recruited to participate in the study. Exposure to American cultural contexts may lead Asian participants in the United States to focus less on configural relationships. Such evidence would suggest the role of culture in shaping face perception. Supporting this possibility, Asian participants in the United States showed the pattern in-between Japanese and American participants in both their accuracy in the spacing set and their self-reported attention to configural aspects of face. Although face processing is known to be highly configural, these findings suggest that cultural contexts can influence the extent to which people attend to configural aspects of face and underscore the robustness of culture’s influence on cognition.

1.1.2 Categorization and attribution

The existence of such cultural differences in attentional styles suggests that even if people are presented with the same stimuli, people from different cultures are looking at different aspects of the stimuli. This could have downstream effects on other cognitive processes that build on the attended information, such as categorization and attribution. Specifically, Westerners’ attention to the focal objects and their attributes may lead them to categorize objects based on attributes of the objects. In contrast, East Asians’ attention to relationships among objects and their context may lead them to categorize objects based on relationships between the objects.

In support of this contention, research has shown cultural differences in object categorization, with some cultures using more taxonomic ways and others using more thematic ways. Taxonomic categorization is based on features shared by the objects (i.e., whether the objects share properties, appearance, or function), whereas thematic categorization is based on spatial, causal, or temporal relationships between the objects (i.e., whether the objects are jointly involved in a theme or context; Markman, 1989; Markman & Hutchinson, 1984). For example, when choosing two objects among three (e.g., a carrot, an eggplant, and a rabbit) that could be grouped together, a carrot and an eggplant would be grouped together according to taxonomic categorization (because both are vegetables), whereas a carrot and a rabbit would be grouped together according to thematic categorization (because rabbits eat carrots). Consistent with predictions, American participants were more likely to use taxonomic modes to group objects than to use
thematic modes, whereas Chinese participants were more likely to use thematic modes to group objects than to use taxonomic modes (Ji, Zhang, & Nisbett, 2004; for cultural differences in another type of categorization, see Norenzayan, Smith, Kim, & Nisbett, 2002).

Attention can guide not only categorization but also attribution. When people are led to focus on an actor (e.g., by brightly illuminating the actor), people tend to attribute an actor’s behavior to dispositional causes more and to situational causes less than when they are not led to focus on the actor (McArthur & Post, 1977). Given that Westerners tend to focus on a focal object (i.e., an actor) and its attributes, they may tend to attribute an actor’s behavior to an actor’s disposition. In fact, studies conducted in Western cultures have repeatedly shown the robustness of the fundamental attribution error—a tendency to overestimate the internal cause (i.e., properties of focal object) and underestimate the external cause (i.e., contextual or situational factors) of behavior (Ross, 1977). On the other hand, if Asians tend to perceive relationships between a focal object or an event and its contexts, they may tend to attribute behaviors to situational causes and thus show weaker or no fundamental attribution error. Supporting this contention, cross-cultural research has shown that the fundamental attribution error is attenuated or nonexistent in Asian cultures (Choi & Nisbett, 1998; Masuda & Kitayama, 2004; Miller, 1984; Miyamoto & Kitayama, 2002; Morris & Peng, 1994; Norenzayan, Choi, & Nisbett, 2002).

In one of the early demonstrations of cultural differences in causal attribution (Miller, 1984), American and Indian participants were asked to narrate behaviors of a person they knew well in their daily lives and to explain why the behavior was undertaken. When explaining the behavior (e.g., cheating behavior), compared to Indian adults, American adults made more reference to general dispositions (e.g., competitive personality) and less reference to contextual factors (e.g., unemployment social status). Similar cultural differences were found between Americans and Chinese (Morris & Peng, 1994). When weighting factors that caused actual mass murder cases, American participants weighted dispositional factors (e.g., chronic psychological problems) more heavily than Chinese participants did, whereas Chinese participants weighted situational factors (e.g., social change) more heavily than American participants did.

Westerners may also infer the disposition of an actor more readily compared to East Asians. One way to test such a possibility is to examine lexical choices because the type of lexicon people choose to describe a behavior reflects underlying inferences (Semin & Fiedler, 1988). Adjectives (e.g.,
helpful) convey information about the disposition of the person, whereas verbs (e.g., helps) provide information about the context surrounding the person or the relationship between the person and objects. If Westerners are more likely than East Asians to make dispositional inference, they may use more adjectives. In fact, research has shown that, compared to Japanese, Italians tend to use more adjectives and fewer verbs to describe others (Maass, Karasawa, Politi, & Suga, 2006). Recent research has also provided neural evidence, which suggests that European Americans spontaneously draw dispositional inferences from observing trait-implying behaviors, whereas Asian Americans do not (Na & Kitayama, 2011; see also Zárate, Uleman, & Voils, 2001).

1.1.3 Temporal information

Studies reviewed so far have focused on cultural differences in the extent to which people focus on focal objects versus their contexts. Recent studies have shown that cultural differences extend to attention to temporal contexts. In a temporal dimension, events that happen close to the present moment can be considered to be focal, whereas events that will happen in a distant future or happened in a distant past can be considered to be relatively more contextual. Because East Asians pay more attention to contextual information, it is possible that they also pay more attention to temporally distant events compared to Westerners. In fact, Maddux and Yuki (2006) found that whereas Westerners focus on proximal consequences, East Asians tend to perceive indirect, distal consequences of an event. For example, when judging the consequences of a shot in a game of pool on subsequent shots, European Americans perceived that the shot would have a larger impact on the next shot than Asian Americans did, whereas Asian Americans perceived that the shot would have a larger impact in the sixth shot after the focal shot than European Americans did.

Such findings show cultural differences in attention to proximal versus distal events that do not involve the self. However, it is not clear if cultural differences in attention to proximal versus distal events extend to the way individuals perceive and react to proximal or distal events in their own life or if such cultural differences have any consequences for individuals. Previous studies have shown that perceiving that a task is useful for fulfilling one’s short-term goals (proximal utility value) or long-term, distal goals (distal utility value) has various motivational benefits (e.g., Hulleman & Harackiewicz, 2009). Given cultural differences in attention to proximal versus distal future events, there may be cultural differences in whether a
proximal or distal utility value brings more benefits. Specifically, East Asians may tend to perceive how the present task (e.g., math problems) is connected to accomplishing distal, long-term future goals (e.g., career endeavor), and thus could be motivated by such a distal utility value. In contrast, Westerners may tend to focus on how the present task is useful for accomplishing immediate, short-term goals (e.g., calculating tips), and thus could be motivated by such a proximal utility value.

To test these hypotheses, Shechter, Durik, Miyamoto, and Harackiewicz (2011) asked participants to learn a new math technique (i.e., how to solve two-digit multiplication without using paper and pencil) through reading an instructional notebook and listening to an audio tape that guided them through the notebook. The manipulation of proximal and distal utility value was embedded in the instructional notebook. Participants in the distal utility value condition were told about the usefulness of the technique in the long-term future (e.g., career endeavor, graduate school), whereas participants in the proximal utility value condition were told about the usefulness of the technique in various everyday life situations (e.g., calculating tips, managing personal finances). After learning the math technique, participants worked on multiplication problems. At the end, participants reported the amount of effort they exerted on the problem sets and how interested they were in the math technique on seven-point rating scales from 1 to 7.

Consistent with the hypotheses, as shown in Figure 3.4, East Asian participants found the technique to be more interesting and reported working harder after the distal utility was highlighted than they did after the proximal utility was highlighted, whereas European American participants showed the opposite pattern. These findings not only highlight differences in attention to proximal and distal events but also provide their potential motivational consequences. They suggest that East Asians gain the most motivational benefit from learning distal connections between the task and long-term goals, whereas Westerners gain the most motivational benefit from learning about proximal connections between the task and short-term goals.

Cultural differences in attention to proximal and distal temporal contexts have also shown in attention to proximal and distal past events (Ji, Guo, Zhang, & Messervey, 2009). When judging the relevance of factors that happened in the past and in the present to solving a case of theft, Chinese participants rated the past information to be more relevant to solving the case of theft than European Canadians did, whereas both groups of participants rated the present information to be equally relevant. As a whole, these findings suggest that East Asians are more likely than Westerners to attend to both
past and future distal events, whereas Westerners are more likely than East Asians to focus on proximal events, and such cultural differences have motivational consequences (Shechter et al., 2011).

1.1.4 Dialectical reasoning
Given East Asians’ attention to relationships among objects, they may also perceive relationships between contradictory elements and tolerate contradictions. Research done in a wide range of domains has provided support for such a possibility (for a review see Spencer-Rodgers, Williams, & Peng, 2010). For example, Peng and Nisbett (1999) found that Chinese participants preferred proverbs that contained a contradiction (e.g., “too humble

Figure 3.4 Task interest and reported effort as a function of culture and utility value manipulation (Shechter et al., 2011, Study 2). The final, definitive version of this paper has been published in Personality and Social Psychology Bulletin, 37/3, March 2011 by SAGE Publications Ltd. All rights reserved. © 2011 SAGE Publications Ltd.
is half proud”) more than American participants did, suggesting that contradictions are more accepted and even preferred by Chinese than by Americans. Such a tendency to accept contradictions has been termed “dialectical” thinking (Peng & Nisbett, 1999).

Another feature of dialectical thinking is to perceive that the reality is a process that is constantly changing rather than fixed entities. In one of their studies, Ji, Nisbett, and Su (2001) presented participants with scenarios depicting various individuals and their current situation and asked participants to estimate a probability that things will change in the future. For example, one scenario depicted a high school student who has been the chess champion for 3 years and participants were asked to judge the likelihood that the student will lose in the next game against the strongest opponent. Chinese participants estimated the probability for things to change to be higher than American participants did. This shows that Chinese tend to anticipate larger changes than Americans do.

1.1.5 Clarifying the relationship between analytic versus holistic and local versus global cognition

It is important to note that, although global cognitive processing and holistic cognitive processing are often equated with each other, they are orthogonal constructs (Kimchi, 1992). Global cognitive processing is processing of properties at a hierarchically higher (global) level of structure than properties at a hierarchically lower (local) level (Navon, 1977). For example, according to the action identification theory (Vallacher & Wegner, 1987), one can represent a behavior (e.g., riding a bike) at a hierarchically higher level (e.g., exercising) or at a hierarchically lower level (e.g., pedaling). A higher level representation indicates global processing, whereas a lower level representation indicates local processing ( Förster & Dannenberg, 2010). On the other hand, holistic (or configural) cognitive processing is processing of relationships between components and/or contexts (Garner, 1978; Rock, 1986; Treisman, 1986), as exemplified by studies reviewed so far in this section. The independence of global and holistic cognitive processing suggests that holistic cognitive processing can sometimes be associated with global cognitive processing when contextual properties are located at a higher level of hierarchical structure, whereas holistic cognitive processing can sometimes be associated with a local cognitive processing when contextual properties are located at a lower level of hierarchical structure.

Understanding the locus of contextual information at different levels of hierarchical structure could provide an explanation for why East Asians
sometimes seem to engage more in local cognitive processing and sometimes seem to engage more in global cognitive processing when compared with Westerners. When contextual information resides in local properties, East Asians tend to show local cognitive processing. For example, verbs, which convey more contextual information than adjectives do (Semin & Fiedler, 1988), are located at a hierarchically lower level of structure compared to adjectives, and Japanese are more likely than Americans to use verbs to describe others (Maass et al., 2006). Thus, in such tasks, Japanese engage in more local cognitive processing than Americans do.

In contrast, when contextual information exists in global properties, East Asians tend to show global cognitive processing. In fact, in many of the visual attention tasks, contextual information is located in a larger field, which is more global than specific parts that comprise the scene. For example, in the FLT (Kitayama et al., 2003), attending to the relationship between the line and the square frame requires more attention to a hierarchically higher (global) level of information than attending only to the line. As reviewed above, East Asians typically show more global cognitive processing in such visual attention tasks. Furthermore, in Navon’s (1977) global-local task, identification of global features (i.e., identifying a large letter consists of smaller letters) requires more attention to configural relationship between smaller letters than does identification of local features (i.e., identifying small letters embedded in a larger letter). Research has that participants who were primed with independence showed facilitated identification of local features compared to identification of global features, whereas those who were primed with interdependence showed the opposite pattern (Kühnen & Oyserman, 2002), suggesting that interdependent cultural constructs can be associated with more global processing when contextual information (e.g., configural relationship) resides in global properties (see also McKone et al., 2010).

These analyses suggest that what characterizes cognitive differences between independent and interdependent cultural environments is the processing of contextual information (and thus holistic or analytic cognitive processing). Cultural differences in global or local cognitive processing seem to depend on the locus of contextual information in the hierarchical structure. This, however, does not rule out the possibility that there might be sociocultural or ecological factors, other than independent and interdependent cultural environments, which influence global or local cognitive processing independently from holistic or analytic cognitive processing. For example, literacy or formal education systems might foster global cognitive processing (e.g., Greenfield, 1972; Scribner & Cole, 1973).
1.2. Moderators of cultural differences

Most of the studies reviewed earlier focused on demonstrating cultural differences in cognitive processing. However, are there any specific conditions or factors that increase or decrease cultural differences? Although not many studies have explored factors that moderate cultural differences in cognition, some moderating factors are proposed in the domain of attitude attribution, especially using the classic attitude attribution paradigm (Jones & Harris, 1967). In this paradigm, participants read an essay either supporting or opposing a certain issue (e.g., Castro’s Cuba) and are asked to infer the true attitude of the protagonist who allegedly wrote it. In addition, some of the participants are told that the protagonist chose whether to support or oppose the issue in the essay (i.e., free-choice condition). Not surprisingly, in this condition, participants tend to infer that the protagonist has an attitude that corresponds to the content of the essay. The other participants are told that the protagonist was assigned to a position by the teacher and thus did not have choice over which position to take (i.e., no-choice condition). Although the situational constraints should be enough to explain the behavior in the no-choice condition, previous studies conducted in Western cultural contexts have repeatedly shown that people fail to take the situational constraints into consideration and tend to infer that the protagonist has an attitude that corresponds to the position stated in the essay (Gilbert & Malone, 1995; Jones, 1979). This tendency has been called correspondence bias.

As reviewed in the foregoing section (e.g., Morris & Peng, 1994; Norenzayan, Choi, et al., 2002), East Asians tend to focus more on contextual information and attribute behavior more to situational causes than Westerners do. Because taking situational constraints into consideration should reduce the correspondence bias, it is logical to expect that East Asians would show less correspondence bias compared to Westerners. However, several cross-cultural studies found that East Asians actually exhibit as strong of a correspondence bias as Westerners do in the standard no-choice condition (Choi & Nisbett, 1998; Krull et al., 1999; Masuda & Kitayama, 2004; Miyamoto & Kitayama, 2002). How can this seeming contradiction be resolved? To account for the contradiction, researchers have explored moderators of cultural differences in correspondence bias.

1.2.1 Situational salience

One of the features of the attitude attribution paradigm is that situational constraint information (i.e., the information that the protagonist was assigned to a position by the teacher) is relatively nonsalient compared to
behavioral information (i.e., the content of the essay). Thus, if the situational information is made more salient, East Asians might take it more into consideration and show less correspondence bias compared to Westerners. Studies have provided evidence supporting this contention. When participants went through the same situation as the protagonist did by writing an essay defending the position assigned to them before inferring the protagonist’s attitude, Korean participants attenuated the degree of correspondence bias compared to the standard paradigm, whereas American participants showed as strong of a correspondence bias as they did in the standard paradigm (Choi & Nisbett, 1998). Similarly, making situational information salient has been shown to increase cultural differences in the correspondence bias even when a different paradigm, where participants played a role in causing the protagonist’s behavior, was used (Masuda & Kitayama, 2004; also see Norenzayan, Choi, et al., 2002). These findings suggest that when situational information is made salient, Americans still show the correspondence bias, whereas East Asians tend to take situational information into greater consideration and hence exhibit an attenuated correspondence bias.

1.2.2 Diagnosticity of behavior

Another feature of the attitude attribution paradigm is that the essay used in the standard no-choice condition is reasonably long and persuasive. It is possible that such a behavior is perceived to be highly diagnostic of the protagonist’s underlying attitude. Even though the protagonist had no choice over which position to defend, the content of the essay (e.g., length, persuasiveness) provides useful information about the willingness of the protagonist to defend the position. If the essay is long and persuasive, it is reasonable to assume that the essay is diagnostic of the true attitude of the protagonist. However, if the essay is short and unpersuasive, it is probably less diagnostic of the true attitude of the protagonist. Part of the reason why Asians may draw as strong of a correspondence inference as Americans in the standard no-choice condition thus might be because they perceived the willingness of the protagonist to defend the position based on these essay features.

To test this hypothesis, Miyamoto and Kitayama (2002) conducted the standard no-choice condition by recruiting both Americans and Japanese and also manipulated the diagnosticity of the essay. Participants were told that a protagonist was attending a political science seminar and asked by an instructor to write an essay supporting (or opposing, depending on the condition) capital punishment. Half of the participants received an essay which was long and persuasive, thus highly diagnostic of the protagonist’s
strong attitude, whereas the other half of the participants received an essay which was short and unpersuasive, thus not diagnostic of the attitude. Based on the information, participants were asked to estimate the real attitude of the protagonist toward capital punishment on a 15-point scale (1 = very strongly opposing, 15 = very strongly supportive).

The results are presented in Figure 3.5. The degree of correspondence bias is indicated by the difference in inferred attitude between proessay and antiessay conditions. Supporting the hypotheses and replicating other studies, there were no cultural differences in the degree of correspondence bias when the essay was diagnostic of the attitude. Both American and Japanese participants inferred that the protagonist had an attitude that corresponded to the position of the essay when the essay was long and persuasive. On the other hand, when the essay was not diagnostic, American participants still showed the same degree of correspondence bias, whereas correspondence bias was attenuated among Japanese participants, suggesting that when the behavior is not diagnostic of the underlying attitude, Japanese pay more attention to situational constraints and show less correspondence bias compared to Americans.

Taken together, these findings suggest that despite cultural differences in attention to situational information, cultural differences in attitude attribution can be surpassed if there is not enough situational information to which

![Figure 3.5](image-url)
to attend, or if the behavior is so diagnostic of the attitude that it overrides attention to situational information. Although moderators have not been explored much in domains other than attitude attribution, it would be informative for future research to explore potential moderators in other domains as well. For example, recent research (Ito, Masuda, & Hioki, 2012) found no cultural differences in attention to a target object versus contextual information when participants were asked to categorize the target’s facial emotions as either positive or negative (rather than to rate the intensity of the target’s facial emotions, as was the case in previous research that found cultural differences using similar stimuli; Masuda, Ellsworth, et al., 2008). This implies the possibility that when contextual information is completely irrelevant to the judgment, even East Asians inhibit their attention to contextual information to the same extent as Americans do. The identification of such moderators sheds light not only on the boundary conditions but also on processes that contribute to cultural differences.

1.3. Summary

In summary, cultural differences in cognition have been demonstrated across various domains. Whereas Westerners tend to focus on focal objects and their properties, categorize objects based on their properties, attribute a cause of a behavior to internal properties, and explain an event by focusing on focal and proximal factors, East Asians tend to focus on relationship between focal objects and their contexts, categorize objects based on their relationships, attribute a cause of a behavior to contextual factors, and explain an event by attending to contextual and distal information. Additionally, the salience of situational information and the diagnosticity of behavioral information have been suggested as moderators of cultural differences in attribution. Further research is needed to elucidate other moderators of cultural differences in cognitive processing.

2. MULTILEVEL ANALYSES OF CULTURAL INFLUENCES ON COGNITION

The preceding summary has shown cultural differences in a wide range of cognitive processes. Such evidence demonstrating cultural differences is essential for understanding the nature and scope of cultural influences. At the same time, the demonstration of cultural differences per se does not explain why there are cultural differences. Therefore, various factors underlying cultural differences in cognitive processing have been
proposed and explored. As illustrated in Figure 3.6, some of the proposed factors are distal-level situational factors that determine the nature of social structures at the level of society, whereas some factors are proximal-level situational factors surrounding individuals in their daily lives, such as cultural practices and products. In addition, some of the factors are also psychological factors. In this section, factors at three different levels will be introduced, highlighting the importance of considering multilevel processes of cultural influences.

2.1. Distal-level situational factors

As introduced in Section 1, various researchers theorize that cultural differences in cognitive processes are rooted in the nature of social environments at a distal level (Fiske et al., 1998; Nisbett, 2003; Nisbett et al., 2001;
Varnum et al., 2010). One of the fundamental ways in which social environments differ across cultures is whether individuals are inherently connected to and embedded in social relationships or if individuals are fundamentally independent from social relationships (i.e., independent vs. interdependent social structures; Fiske et al., 1998; Markus & Kitayama, 1991; Triandis, 1989). Living in social environments where individuals are mutually dependent on others presumably requires attention to relationships and to contexts. On the other hand, living in social environments where individuals are independent from surrounding others may allow individuals to focus on their own goals and their target objects without being overly constrained by surrounding contexts or surrounding others’ demands.

Research traces cultural differences to these social structure differences, which have been shaped through the history of each society (e.g., ecology, voluntary settlement, political system; the top box in Figure 3.6). For example, Nisbett and his colleagues have proposed that East–West differences in cognitive processes can be traced back to ecological and sociostructural differences between Ancient Greek and Chinese societies (Nisbett, 2003; Nisbett et al., 2001). Ancient Chinese society was based on large-scale agriculture, which involved cooperation and coordination among a large number of individuals. In such a society, social relations were characterized by interdependence among individuals, which likely has fostered attention to relationships and to the contexts. In contrast, Ancient Greek society was based on herding, fishing, and small-scale agriculture, which did not involve much cooperation or coordination among a large number of individuals. Social relations in such a society were characterized by autonomy and independence of each individual, which might have contributed to focused attention to focal objects.

Several lines of research have provided support for such a link between the modes of social structures and cognitive styles by comparing societies that differ in their social structures due to ecological or sociopolitical factors. For example, ecology and social structures of the community have been linked to cognitive styles (Witkin & Berry, 1975). Individuals living in Canadian Eskimo communities, where people engage in hunting and have flexible social relations, showed more analytic cognitive processing than those who live in Temne communities in West Africa, where people engage in rice farming and emphasize conformity (Berry, 1966). Although such findings are suggestive of the effects ecology has on cognitive processing, Canadian Eskimo communities differ from Temne communities not only
in their ecology and social structures but also in various other ways, such as ethnicity or language. A more recent research, thus, has explored whether a similar association between ecology and cognitive styles can be found even when communities within the same nation were examined (Uskul, Kitayama, & Nisbett, 2008). By comparing communities in Turkey, researchers found that people who live in herding communities, where autonomy is emphasized, showed more analytic cognitive processing compared to those who live in farming communities and fishing communities, where close cooperation among the family members is required.

Societies also differ in their social structures due to historical and sociopolitical factors. Among Western cultures, due to the history of feudalism in Southern Italy (Putnam, 1993) and communist regimes in Central and Eastern Europe, social structures in Southern Italy and Central and Eastern Europe have historically been interdependent compared to those in Northern Italy, Western Europe, and the United States. In line with the differences in social structures, southern Italian participants made more thematic categorization, thus showing more holistic cognitive processing, than northern Italian participants did (Knight & Nisbett, 2007), and Russian and Croatian participants attended to more contextual information in a visual task than American participants did (Grossmann & Varnum, 2011; Varnum, Grossmann, Katunar, Nisbett, & Kitayama, 2008). Furthermore, a history of voluntary settlement might have fostered an independent mode of social structure where freedom from constraint and personal agency is promoted (Turner, 1920). If so, living in a “frontier” may foster more analytic cognitive processing. In support of this possibility, people who live in voluntary settlement societies (i.e., the United States or Hokkaido in Japan) show more analytic cognitive styles compared to those who live in nonvoluntary settlement societies (i.e., Western Europe or mainland Japan; Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006; Kitayama, Park, Seviner, Karasawa, & Uskul, 2009).

Religious beliefs and practices also shape the modes of social relations, which in turn could influence cognitive processing. In fact, recent studies found that different religions foster analytic or holistic cognition, depending on the modes of social relations emphasized by the religion. For example, the inward state and beliefs of individuals are emphasized over church rituals in Protestants (Cohen, Hall, Koenig, & Meador, 2005; Weber, 1958). Reflecting such a focus on the inward condition of the soul, Protestants were more likely than Catholics to endorse internal attributions when attributing the cause of behaviors (Li et al., 2012). In addition, religious beliefs have also been shown to influence attention to local versus global features in Navon’s
task (Colzato, Hommel, van den Wildenberg, & Hsieh, 2010; Colzato, van Beest, et al., 2010). In this task, participants are usually faster to judge global, relational features than to judge local, analytic features, thus showing the global-precedence effect (Navon, 1977). Dutch Calvinists, whose religion emphasizes individual responsibilities, showed a weaker global-precedence effect, thus demonstrating more analytic, focused attention, compared to Dutch Atheists. In contrast, Italian Roman Catholics and Israeli Orthodox Jews, whose religions emphasize social responsibilities, as well as Taiwanese Buddhists, whose religion emphasizes compassion and physical and social contexts, showed a stronger global-precedence effect, thus demonstrating more holistic, relational attention, than did matched seculars in their respective countries.

Lastly, even within the same society, people coming from different social classes are exposed to, and are living in, different social environments. Middle-class environments involve a higher sense of control and more resources to influence the environment, whereas working-class environments involve a lower sense of control and more of a need to adjust to the environment (Lachman & Weaver, 1998; Snibbe & Markus, 2005; Stephens, Markus, & Townsend, 2007). Differences in social structures have been linked to different styles of cognitive processing. Compared to middle-class individuals, working-class individuals tend to prefer situational explanations, make thematic categorization, attend to contextual information in perceptual tasks, and endorse dialectical views (Grossmann & Varnum, 2011; Kraus, Piff, & Keltner, 2009; Miyamoto & Ji, 2011; Na et al., 2010).

### 2.2. Proximal-level situational factors

These previous studies have demonstrated that individuals who live in societies that have more interdependent social structures tend to show a more holistic cognitive style compared to those who live in societies that have more independent social structures (thus showing a link between the top box and the bottom box in Figure 3.6). However, the process through which such group-level differences in social structures shape and influence the cognitive style of each individual is not clear. In order to understand exactly how living in interdependent (or independent) social environments guides people’s attention to contextual and relational (or focal) information, it is crucial to unpack proximal-level processes that bridge the gap between distal-level situational factors and individual’s cognitive processing as illustrated in the middle box in Figure 3.6.
Distal-level situational factors shape the core social structure and ideas of a society, which, in turn, shape and become reflected in proximal-level situational factors surrounding individuals in their daily lives, such as social interactions, practices, and products (Fiske et al., 1998; Markus & Kitayama, 1994). Through participation in, and exposure to, such proximal-level situational factors, individuals’ cognitive processing is likely to become attuned to the dominant mode of social structure and ideas reflected in these proximal contexts. Prolonged participation in, and repeated exposure to, such proximal factors may shape individuals’ habitual style of cognitive processing. At the same time, proximal-level situational factors are collective processes which are shaped and maintained by individuals who participate in them. Thus, proximal contexts, such as social interactions and practices, not only shape and influence individuals but also are shaped and maintained by individuals, suggesting the mutual relations between proximal contexts and individuals’ psychological processes (Fiske et al., 1998; Shweder, 1990).

In addition, when considering the relationship between proximal-level contexts and cognitive processing, it is useful to distinguish between two domains of proximal-level contexts: analytic versus holistic domain and independent versus interdependent domain. Some proximal contexts reflect analytic versus holistic cognition prevalent in a given culture, such as the amount of dispositional or situational explanations presented in mass media (Morris & Peng, 1994). Through repeated exposure to such proximal contexts, individuals are likely to attune their cognitive processes to fit the pattern of information that exists in their proximal contexts. At the same time, proximal contexts can also guide cognitive processing through a more indirect route—through interdependent versus independent proximal contexts. Some of the proximal contexts reflect interdependent versus independent modes of social relationships prevalent in a given culture, such as the extent to which textbooks emphasize self-direction or group harmony (Imada, 2012) or the extent to which communication practices place emphasis on relationship maintenance (Miyamoto & Schwarz, 2006). Engaging in interdependent proximal contexts is likely to guide attention to relationships and social contexts, which in turn may lead attention to contextual information in general, thus contributing to holistic cognitive processing. In contrast, engaging in independent proximal contexts is likely to guide attention to the self and to one’s goals, which in turn may lead attention to focal information in general, thus contributing to analytic cognitive processing.
Despite the crucial role proximal-level situational factors play in shaping individuals’ cognitive processing, compared to the amount of research done on the effects of distal-level factors on cognitive processing, relatively little attention has been given to the processes through which proximal-level situational factors influence cognitive processes. Below, by distinguishing analytic versus holistic and independent versus interdependent domains, processes through which such proximal-level contexts foster cognitive processing are outlined.

2.2.1 Analytic versus holistic proximal contexts

Proximal-level situations can attune and guide cognition by directly channeling individuals’ attention to either focal or contextual aspects of environments and inducing corresponding cognitive processing.

Culturally specific styles of cognitive processing can be reflected in various kinds of social practices in which people engage in their daily lives, such as parental practices and linguistic practices. For example, when talking to their infants playing with toys, compared to Japanese mothers, American mothers were more likely to label toys to their infants, thus highlighting the objects (Fernald & Morikawa, 1993; also see Tardif, Gelman, & Xu, 1999). In addition, culturally specific styles of cognition can also be reflected in communication practices (Hall, 1976). For example, when describing a situation in which they engaged in nonverbal communication, American participants reported relying mainly on facial and bodily cues (e.g., facial expressions, body language), which are relatively salient, explicit nonverbal cues, whereas Japanese participants reported taking into account situational cues (e.g., weather, atmosphere) in addition to facial and bodily cues, suggesting that Japanese nonverbal communication requires more attention to less salient contextual cues than American nonverbal communication does (Eggen, Miyamoto, & Uchida, 2012; also see Ishii, Reyes, & Kitayama, 2003; Tanaka et al., 2010).

Cultural differences in cognitive styles are also embodied and reflected in cultural products to which people are exposed in their daily lives (for a meta-analysis, see Morling & Lamoreaux, 2008). For example, American newspapers referred more to dispositional causes than Hong Kong newspapers did when covering sports events (Lee, Hallahan, & Herzog, 1996; also see Morris & Peng, 1994), and American mass media focused more on personal characteristics and less on the backgrounds of athletes than Japanese mass media did when covering Olympic games (Markus, Uchida, Omoregie, Townsend, & Kitayama, 2006). Cultural products are not confined to narratives. The characteristic cognitive style can also be embodied and reflected
in the visual properties of products and environments. For example, Eastern traditional paintings, including both portraits and landscapes, tend to include a larger amount of contextual information than do Western counterparts (Masuda, Gonzalez, Kwan, & Nisbett, 2008).

Cognitive styles may be embodied even in the nature of perceptual environments, such as townscapes. Reflecting a holistic cognitive style, objects may not look distinct from each other and may look more complex in Japanese townscapes than in American townscapes. To test this hypothesis, Miyamoto, Nisbett, and Masuda (2006, Study 1) sampled about 1000 townscapes of Japan and the United States by randomly selecting public elementary schools, post offices, and hotels from cities of three different sizes in each culture and taking pictures in front of, and one street behind, each institution (examples are shown in Figure 3.7). When presented with these photos of randomly sampled perceptual environments of Japan and the United States, and asked to judge the complexity and ambiguity of them (e.g., “How ambiguous is the boundary of each object?”), participants rated Japanese perceptual environments to be more complex and ambiguous compared to the American perceptual environments, suggesting cultural differences in the perceptual environments. In addition, to provide an objective measure of complexity, the number of bounded particles in each picture was counted by an image analysis software. In line with the subject judgment, it was found that Japanese perceptual environments contained a larger number of objects than American perceptual environments.

Prolonged and repeated exposure to such culturally divergent perceptual environments may afford culturally specific patterns of attention. If the Japanese perceptual environments are more complex and boundaries between objects are ambiguous, it might be harder to distinguish objects from the background in such perceptual environments and thus attention might be guided more toward the whole field. Repeated exposure to such complex and ambiguous perceptual environments may thus afford holistic cognitive processing, at least temporarily. This hypothesis was tested in the subsequent study (Miyamoto et al., 2006, Study 2). As a cover story, American and Japanese participants were told that the study was about visual image processing and that they would work on two ostensibly different tasks (i.e., a scenery rating task and a change detection task). The scenery rating task, which was introduced to participants as a pretest to select pictures for the future experiment, was the manipulation of exposure to perceptual environments. In this task, participants were randomly assigned to see 95 American or Japanese perceptual environments and asked to imagine that
they were placed in the scenery and judge how much they liked it. Subsequently, they worked on the change-blindness task (Masuda & Nisbett, 2006), which was the measure of cognitive processing. In this task, participants were presented with pairs of animated vignettes depicting culturally neutral scenes (e.g., construction site) and asked to detect changes among each pair. Some changes were made in regard to the attributes of focal objects (e.g., the presence or absence of a person on a truck), whereas the other changes were made in regard to contextual information (e.g., the location of the truck, changes in background objects).

Replicating cultural differences in attention (e.g., Masuda & Nisbett, 2001, 2006), Japanese participants detected a larger number of changes in
contextual information than American participants did, whereas there were no cultural differences in the detection of changes in focal objects (see Table 3.1). More importantly, however, those participants who were exposed to Japanese perceptual environments in the first task detected a larger number of changes in contextual information compared to those who were exposed to American perceptual environments. Consistent with the previous finding which found cultural differences only in the detection of contextual changes (Masuda & Nisbett, 2006), there were no effects of perceptual environments on the detection of changes in focal information. These findings suggest that exposure to Japanese perceptual environments can afford attention to contextual information compared to exposure to American perceptual environments, thus providing evidence for the role of proximal-level contexts in channeling cognitive processing (see also Ueda & Komiya, 2012, for a replication of this study using an eye-tracking device).

### 2.2.2 Independent versus interdependent proximal contexts

Cognitive processing is not only directly guided by exposure to analytic versus holistic proximal contexts but also guided through participation in interdependent versus independent proximal contexts. Through participation in interdependent or independent proximal contexts, individuals may attune their cognitive processing to fit the needs of the proximal contexts, resulting in culturally divergent cognitive processing. Specifically, engagement in interdependent proximal contexts that highlight one’s adjustment to social contexts may require attention to surrounding others and social contexts, which in turn may foster attention to contextual information in general (i.e., holistic cognition), whereas engagement in independent proximal contexts that highlight pursuit of one’s unique goals may guide attention to the self and to one’s goals, which may lead attention to focal information in general (i.e., analytic cognition).
First of all, studies have shown that interdependent or independent modes of social structure are manifested in cultural products (Morling & Lamoreaux, 2008). American textbooks tended to emphasize independent themes, such as self-direction and achievement, whereas Japanese textbooks tended to emphasize interdependent themes, such as conformity and group harmony (Imada, 2012) and American magazine ads tended to emphasize uniqueness compared to Korean magazine ads, whereas Korean magazine ads tended to emphasize harmony compared to American magazine ads (Kim & Markus, 1999).

A recent study has shown that emphasis on uniqueness versus harmony can also be encoded in visual stimuli, such as colorings of geometric patterns, devoid of any explicit verbal messages (Ishii, Miyamoto, Rule, & Toriyama, 2012). In the first step of this study, both American and Japanese students were asked to color patchwork-like geometric patterns using a set of 24 colored pencils. Analyses of visual features of the colored figures revealed that Japanese students were more likely to use lighter colors (e.g., whitish colors or pastels) than American students. Such use of lighter colors is likely to make Japanese colorings look more harmonious. To examine whether Japanese colorings are indeed perceived as more harmonious than American colorings, in the second step, different groups of American and Japanese students were recruited and asked to rate harmoniousness or uniqueness of the colorings made by participants in the first step. Both American and Japanese raters judged Japanese colorings to be more harmonious than American colorings, and American colorings to be more unique than Japanese colorings. Such findings illustrate subtle ways through which interdependent or independent modes of social structure can be represented in cultural products.

Social interactions and practices, such as communication practices, can also reflect the mode of social structure characteristic of the society. Communication serves functions to convey information as well as to maintain relationships in any cultures. However, communication practices in interdependent proximal contexts may be especially likely to require people to focus on the relational function. It thus may be more difficult for people in interdependent proximal contexts to communicate when they have to convey information under a condition where they cannot readily engage in relationship maintenance, such as when leaving a request on an answering machine. To test this hypothesis, Miyamoto and Schwarz (2006) asked Japanese and American participants to role-play a senior student who is on the way to attend a conference to present his/her honors thesis and realized that she or he left an important presentation material on an office desk. Participants were asked to call either a peer or a
professor and to make a request (i.e., to send the material to a conference center) on an answering machine. In addition, to measure the amount of cognitive resource left available during the communication, participants were asked to work on a secondary cognitive task on a computer while placing a call.

As hypothesized, Japanese participants attended to relational functions more than American participants did; they tailored their message more to the recipient of the message (i.e., their message was more friendly and less polite when calling a peer than when calling a professor) and left a longer message, presumably reflecting their concern for relationship maintenance. Partly due to Japanese participants’ attention to relational functions, Japanese participants had less cognitive resource left available to work on the secondary task and showed lower performance on the secondary task compared to American participants. Interestingly, consistent with such cultural differences in the message length, answering machines made by Japanese manufacturers offered a longer time limit for an incoming message than did those made by American manufacturers. These findings suggest that communication practices in Japan are likely to emphasize the relational function more than communication practices in the United States, whereas communication practices in the United States tend to focus on the informational function more than communication practices in Japan. Cultural differences in relational functions of communication practices have also been shown in the extent of behavioral adjustments—how much people align their behavior to surrounding others. A meta-analysis of conformity studies based on Asch’s paradigm across 17 countries found that the conformity rate was higher in countries based on interdependent social structures than in those countries based on independent social structures (Bond & Smith, 1996).

Participation in such interdependent proximal contexts and adjustment to social contexts may require holistic cognitive processing. In support of this, researchers have shown a link between behavioral mimicry and holistic cognitive processing (Van Baaren, Horgan, Chartrand, & Dijkmans, 2004). Those participants who attended more to contextual information in a visual attention task were more likely to mimic nonverbal behaviors of a target person presented in a video clip, suggesting a link between holistic cognitive processing and behavioral alignment to others. Furthermore, when participants’ own nonverbal behaviors were mimicked by the experimenter, participants displayed increased recall of objects’ locations, suggesting that behavioral mimicry can foster processing of contextual information.

In addition, concerns arising from social interaction issues have also been linked to holistic cognitive processing (Kim & Markman, 2006). Participants
who were reminded of a time when they were socially isolated attended more to the relationship between a focal object and its background, presumably because a fear of isolation motivated them to focus on others and social contexts. The type of social concerns matters too. Whereas a self-focused manifestation of social anxiety (i.e., social phobia; e.g., “I get nervous that people are staring at me as I walk down the street”) was correlated with relatively better analytic performance on the FLT, an other-focused manifestation of social anxiety (i.e., *taijin kyofusho*; e.g., “I am afraid that I will blush in front of other people and as a result offend them”) was correlated with relatively better holistic performance on the FLT (Norasakkunkit, Kitayama, & Uchida, 2012). These findings suggest that engagement in self-focused, independent proximal contexts is linked to, and fosters, analytic cognitive processing, whereas engagement in other-focused, interdependent proximal contexts is linked to, and fosters, holistic cognitive processing.

### 2.3. Individual-level factors

Another way to understand how distal group-level differences in social structures influence cognitive processes is to examine the link between different modes of social structures and cognitive processing at the individual level, through mediation of psychological orientations at the individual level. This mechanism refers to the following links in Figure 3.6: independent versus interdependent social structures (top box) → independent versus interdependent psychological orientation (bottom left box) → analytic and holistic cognition (bottom right box). A body of cross-cultural literature has documented that interdependent and independent modes of social structures shape and influence interdependent versus independent psychological orientations of individuals, such as self-concepts, emotion, and motivation (Fiske et al., 1998; Markus & Kitayama, 1991, 1994; Triandis, 1995). In turn, these individual psychological orientations may be associated with individual cognitive styles. Thus, researchers have been examining how independent versus interdependent psychological orientations are linked to analytic and holistic cognition (i.e., the link between the bottom left and bottom right boxes in Figure 3.6).

One way to examine this link is to activate or “prime” the ideas associated with interdependent or independent psychological orientations in individuals’ minds and examine whether the activated ideas lead to the corresponding cognitive processing. Researchers have proposed various methods to prime interdependent or independent psychological orientations (e.g., Gardner, Gabriel, & Lee, 1999). For example, asking participants to
think what makes them different from their family and friends primes’ independence, whereas asking participants to think what they have in common with their family and friends primes interdependence (Trafimow, Triandis, & Goto, 1991). Studies have shown that priming the concept of independence or interdependence can foster corresponding styles of cognition (for a meta-analysis, see Oyserman & Lee, 2008). For example, after participants were primed with interdependence by circling first-person plural pronouns (e.g., “we,” “us”), they were faster to identify global features in Navon’s global-local task and better at recalling objects’ location than after they were primed with independence by circling first-person singular pronouns (e.g., “I,” “me”; Kühnen & Oyserman, 2002), suggesting that priming the idea of interdependence fosters holistic cognitive processing.

Another way to examine the link between independent or interdependent psychological orientations and cognitive styles is to measure individual differences in each domain and examine correlations between them. However, recent large-scale studies that explored the relationships between individual differences in psychological orientations and individual differences in cognitive styles found only weak correlations between them (Kitayama et al., 2009; Na et al., 2010). In addition, the correlations among tasks within each domain were also weak, suggesting the possibility that psychological orientations and cognitive styles may not exist as coherent sets of traits that differentiate individuals within each culture. This is in stark contrast to the large body of cross-cultural evidence showing that psychological orientations and cognitive styles exist as coherent sets of descriptors of group characteristics.

Taking proximal-level processes into consideration may help researchers to understand the dissociation between individual-level and group-level characteristics. It is possible that, even though distal-level social structural differences shape proximal-level contexts, which in turn shape psychological processes of individuals who participate in them, each individual is exposed to only a subset of proximal-level contexts, to which one attunes psychological processes. For example, interdependent social structures in Japan may be reflected in the nature of their proximal-level contexts, such that their mass media may highlight situational causes of behavior, and their communication practices may require more attention to contextual nonverbal cues. Some individuals are likely to be exposed to mass media frequently but do not engage much in communication practices, whereas some other individuals are likely to be engaged in communication practices frequently but are not exposed much to mass media. To the extent that individuals attune
their psychological processes to fit the proximal context to which they are exposed, individuals may differ in which specific domains they engage in holistic cognitive processing. The former type of individuals may be holistic in their attributional style, but may not be particularly holistic in other cognitive domains, whereas the latter type of individuals may be holistic in their attentional style, but may not be particularly holistic in other cognitive domains. Thus, there could be multiple ways for people to attune their cognitive styles or psychological orientations to the cultural patterns within the same culture, which could lead to weak correlations within each culture at the individual-level but strong associations across cultures at the group-level. Although cultural differences are often attributed to individual differences in the study of culture (Shweder, 1973), the contrasting patterns between group-level and individual-level processes indicate the importance of distinguishing different levels of analyses and examining the relationship between them.

The effects of different social structures on cognitive processing have also been examined by focusing on bicultural individuals who have been exposed to two different social structures and thus have internalized two different systems of psychological processes. These bicultural individuals may be able to frame-switch between different systems of psychological processes depending on cultural contexts. Supporting this prediction, Hong Kong Chinese made more situational attributions after being exposed to Chinese cultural icons than after being exposed to American cultural icons (Hong, Morris, Chiu, & Benet-Martínez, 2000). Other research has shown that even European Americans shift their cognitive style after exposure to East Asian cues (e.g., a symbol of yin-yang) by making more dialectical predictions (Alter & Kwan, 2009).

2.4. Summary

A growing body of literature shows that factors at multiple levels underlie cultural differences in cognitive processing. At the most distal level, ecological and sociopolitical environments shape the core social structure of a society. Social structures, in turn, shape and become reflected in proximal-level contexts, in which individuals are located in their daily lives. Through participation in, and exposure to, such proximal-level contexts, cognitive styles of individuals become attuned to the cultural pattern reflected in the proximal-level contexts. In addition, cognitive processing can also be fostered by the activation of corresponding psychological constructs even at the individual level. The role of proximal-level
processes underscores the importance of taking a multilevel approach to understand cultural influences on cognitive processing.

3. CULTURALLY CONTINGENT SITUATED COGNITION: A CASE FOR CULTURAL MODERATION OF A PROXIMAL-LEVEL SITUATIONAL FACTOR

Although studies reviewed in the preceding section suggest that various situational factors foster corresponding cognitive processing, effects of factors on cognitive processes may not be deterministic. In a collective system, such as culture, which is comprised of multiple factors at multiple levels that coexist in a state of tension, the effect of a factor depends on the totality of the system (Lewin, 1951; Ross & Nisbett, 1991). This suggests that an analysis of the coexisting factors in the system is important when understanding and predicting the effects of a factor. Thus, in order to predict the effect of a factor on cognitive processes, it is necessary to understand the nature of multilevel structures in which the factor is located.

Furthermore, construal or subjective meaning that actors attach to situational factors may also influence the effect of a factor; the impact of “objective” situational factors depends on how actors construe their meaning (Ross & Nisbett, 1991). To predict the effect of a certain situational factor on the behavior, one thus needs to know how the actors interpret it in relation to their goals, values, and beliefs situated within each cultural context. The same situational factor may lead to different behaviors depending on cultural contexts, if different cultural contexts provide different ways to construe the factor.

Power might be one of such proximal-level factors whose effects particularly depend on distal-level factors in which it is located. Studies conducted in Western cultural contexts have suggested that power plays a crucial role in guiding cognition, emotion, and behavior (Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003). However, the effects of power on psychological processes could depend on the distal-level social structures in which power is located. In this section, I first describe research that has examined the effects of power on cognition in Western cultural contexts and then describe research that has examined the effects of power across cultures to illustrate how distal-level factors can moderate the effects of power.

Here, power is defined as the capacity to influence others (Dahl, 1957; French & Raven, 1959; Vescio, Snyder, & Butz, 2003). According to French and Raven (1959), the strength of power that person A has over
person B is defined as the maximum potential ability of person A to influence person B, such as changing person B’s behavior, needs, or values. Thus, for example, bosses typically have power over their subordinates, to the extent that bosses have the potential ability to change subordinates’ behavior, needs, or values.

3.1. Cognitive consequences of power in Western cultures

3.1.1 Power fosters processing of goal-relevant information

Previous studies have repeatedly shown the psychological effects of having power or being in positions of power in Western cultural contexts (Fiske, 1993; Fiske & Dépret, 1996; Keltner et al., 2003). One of the central characteristics of power is to allow individuals who are in positions of power to pursue and attain goals related to their own rewards (Keltner et al., 2003). Powerful individuals may thus tend to selectively focus on the information relevant to their goal-pursuit without being distracted by peripheral information. On the other hand, it is harder for individuals without power to pursue their goals. Instead, powerless individuals tend to adjust themselves to others more than powerful individuals do (Anderson, Keltner, & John, 2003). Powerless individuals may thus need to attend not only to information relevant to their goals but also to peripheral, contextual information, in order to adjust themselves.

Supporting this possibility, powerful individuals have been shown to process goal-relevant information more than powerless individuals do (Overbeck & Park, 2001). Participants were assigned to the role of either a professor or a student and engaged in an e-mail role play. Through the e-mail exchanges, the student had to make a request (e.g., arrange a meeting) and the professor could determine the outcome. After the role play, participants were asked to recall information about their partner. Those who were assigned to be a professor were especially more likely to recall information relevant to the task (e.g., the other person has an inflexible schedule) than were those who were assigned to be a student. Furthermore, whereas professor-role participants recalled relevant information more than irrelevant information (e.g., the other person was once on the amateur golf circuit), student-role participants recalled relevant and irrelevant information equally. These findings suggest that exerting power fosters processing of goal-relevant information.

Studies have also shown that power encourages attention to stereotype-confirming information (Fiske & Dépret, 1996; Goodwin, Gubin, Fiske, & Yzerbyt, 2000). For example, in Goodwin and colleagues’ studies, participants
were presented with information about six applicants for a high school internship program. For the two target applicants, the targets’ ethnicity was highlighted. Then, participants received two types of information: information that confirmed stereotypes about the ethnicity and information that disconfirmed stereotypes about the ethnicity. Power was manipulated by telling half of the participants that their evaluations would not affect the final decisions (i.e., no-power condition) and telling the other half of the participants that their evaluations would play a major role in who would be selected (i.e., powerful condition). Participants in the powerful condition more selectively attended to stereotype-confirming information than to stereotype-disconfirming information, whereas participants in the no-power condition attended to both types of information equally. These findings thus support the possibility that power fosters selective attention to information that is focal and consistent with the salient aspect of the target person (i.e., ethnicity).

Power has also been shown to foster processing of “gist” by facilitating attention to stimuli that are primary and relevant to the task, even when nonsocial stimuli are used (Smith, Jostmann, Galinsky, & van Dijk, 2008; Smith & Trope, 2006). Compared to powerless participants, powerful participants tend to perform better on the Embedded Figure Test (EFT; Witkin, Oltman, Raskin, & Karp, 1971), where the task is to find a small figure that is embedded within a larger, complex pattern (Smith & Trope, 2006). Because the small figure is more relevant to the goal of the task than the complex overall pattern, powerful individuals’ superior performance on the EFT seems to indicate their focused attention to task-relevant information, whereas powerless individuals’ inferior performance on the EFT seems to indicate their divided attention to both task-relevant and task-irrelevant information.

Guinote (2007a) has further suggested that power leads to the selective processing of information relevant to the goal of the task and inhibits processing of peripheral, irrelevant information. For example, one study showed that powerful individuals are better at focusing on central information and ignoring peripheral information compared to powerless individuals (Guinote, 2007b, Experiment 2). Participants were assigned to the role of either a subordinate or a manager. Subsequently, they worked on a stimulus–response compatibility paradigm (Tucker & Ellis, 1998), in which pictures of graspable objects (e.g., a cup) were presented and participants had to judge as fast as possible whether each object was upright or inverted by pressing a left or right response key. Participants who were assigned to be subordinates responded more slowly when the irrelevant
dimension (i.e., whether a handle is on a left or right side of the cup) was incompatible with the correct response key (i.e., pressing a left or right response key) than when it was compatible, whereas participants who were assigned to be managers were not influenced by the irrelevant dimension. This suggests that powerless individuals attend to the information irrelevant and peripheral to the task (i.e., direction of the handle), whereas powerful individuals focus on information central to the task (i.e., position of the cup) and ignore peripheral information.

3.1.2 Power fosters analytic cognition

Attention to the target of one’s goal (as opposed to peripheral information) is closely linked to attention to focal (as opposed to contextual) information because the target of one’s goal is likely focal and not peripheral information. Thus, power may influence not only processing of goal-relevant versus peripheral information but also analytic versus holistic cognitive processing. Specifically, when one is influencing others, objects or people who are the targets of one’s goal are more salient than the surrounding contexts. Therefore, exerting power may also facilitate processing of focal objects or people and their central features independently from the surrounding contexts, leading to analytic cognitive processing. On the other hand, being subject to another person’s power may facilitate processing of the relationship between focal objects or people and their surrounding contexts, leading to holistic cognitive processing.

The hypothesized link between power and analytic cognition has been shown across different cognitive tasks. One task examined the types of words people use to describe other people. The same person or the same behavior can be described in multiple ways. For example, when describing someone who often snaps at others, one can describe the person as someone who “snaps at others” or “is aggressive.” The type of words people use to describe a person conveys different underlying information and inferences about the person (Semin & Fiedler, 1988), as discussed in Section 1.1. Specifically, verbs provide information about the context surrounding the person, whereas adjectives convey information about the disposition of the person that transcends specific contexts. Thus, if being subject to another person’s power is linked to more processing of contextual information, people may use more verbs to describe a person when they are subject to the person’s power (e.g., when the person is their supervisor) compared to when they are not subject to the person’s power (e.g., when the person is their colleague).
One study explored such a possibility in a naturalistic setting (Miyamoto & Schwarz, 2004) by asking American students at a community college to recall two recent interactions they had at their job: one interaction with their supervisor and the other interaction with their colleague (counterbalanced within each participant). They were asked to briefly describe either their supervisor or colleague and their recent interaction. All the sentences in which the target person (either the supervisor or colleague) was the subject of the sentence were coded to examine how frequently the target person was described with verbs or adjectives. For example, as part of the descriptions, one respondent wrote “She [my supervisor] often tries to guilt me into doing more than my job requires,” which was coded as a verb. Another participant wrote “My colleague is a very nice person,” which was coded as an adjective. As shown in Figure 3.8, respondents used more verbs to describe their supervisor, who likely had power over them, than to describe their colleague, who likely had less power over them. There were no differences in the amount of adjectives respondents used to describe a supervisor or a colleague, potentially due to the overall low frequency of adjectives when describing a person in interactions. These findings suggest that people tend to use more verbs to describe someone when they are subject to the person’s power compared to when they are not subject to the person’s power.

The link between power and the use of words was also explored in another study (Miyamoto & Ji, 2011, Study 1). Participants were told that the study involved two ostensibly unrelated tasks (i.e., an episodic memory task and a verbal description task). Power was manipulated by the episodic memory task, with participants in the high power condition being asked to recall an interaction with a supervisor and those in the low power condition being asked to recall an interaction with a colleague. The number of adjectives and verbs used to describe their supervisor or their colleague when describing their interactions (Miyamoto & Schwarz, 2004).
memory task, where participants were randomly assigned to one of three conditions: influence, adjustment, and neutral conditions. In the influence condition, participants were asked to recall two situations in which they had influenced or changed the surrounding people according to their own wishes. In the adjustment condition, participants were asked to recall two situations in which they had adjusted themselves to surrounding others. Participants in the neutral condition were asked to recall two situations in which they had interacted with surrounding others. In the subsequent task, participants were asked to work on a verbal description task (Maass et al., 2006), where they were asked to think about a student of the same sex whom they knew very well and to describe what type of person she or he was or what she or he did at school/work.

As shown in Figure 3.9, after recalling situations in which they influenced other people, participants were more likely to use adjectives to describe another student than after recalling situations in which they adjusted to other people, whereas recalling neutral interactions did not differ from either condition. The opposite trend was observed for the use of verbs to describe another student. After recalling situations in which they adjusted to other people, participants were marginally more likely to use verbs to describe another student than after recalling situations in which they influenced other

![Figure 3.9](image-url) The likelihood of using adjectives and verbs to describe another student as a function of the type of incidents they recalled in the preceding task (Miyamoto & Ji, 2011, Study 1). The final, definitive version of this paper has been published in Personality and Social Psychology Bulletin, 37/11, November 2011 by SAGE Publications Ltd. All rights reserved. © 2011 SAGE Publications Ltd.
people. These findings suggest that exerting power over others facilitates the use of adjectives (i.e., analytic cognition), whereas adjusting to others facilitates the use of verbs (i.e., holistic cognition).

The link between power and analytic cognition has also been shown in the way in which people categorize objects (Miyamoto & Ji, 2011, Study 2). As introduced in Section 1.1, when presented with a carrot, an eggplant, and a rabbit and asked to choose the two that go together, there are two typical ways in which adults categorize them: taxonomic categorization (i.e., grouping carrot and eggplant because both are vegetables) or thematic categorization (i.e., grouping carrot and rabbit because rabbits eat carrots). Taxonomic categorization is based on features (e.g., properties, appearance, or function) shared by objects, whereas thematic categorization is based on spatial, causal, or temporal relationships between objects (Markman, 1989; Markman & Hutchinson, 1984). Thus, if power facilitates processing of central features of objects independently from the surrounding contexts, power may foster taxonomic categorization.

Following the procedure of the abovementioned study, power was manipulated by the episodic memory task. Participants were asked to recall two situations in which they either influenced or adjusted to other people. Subsequently, participants worked on the categorization task (adapted from Ji et al., 2004), where they were presented with several sets of three words (e.g., seagull, sky, and dog) and asked to indicate which two of the three in each set were most closely related and why. There were 8 critical sets embedded within 12 sets. Based on their grouping and reasoning, participants’ responses to each of these eight sets were coded as taxonomic, thematic, or neither.

Consistent with the hypothesis, after recalling situations in which they influenced other people, participants were more likely to make taxonomic categorizations than after recalling situations in which they adjusted to other people. The opposite was the case for thematic categorization. That is, after recalling situations in which they adjusted to other people, participants were more likely to make thematic categorizations than after recalling situations in which they influenced other people. These results suggest that exerting power fosters taxonomic categorization, whereas adjusting to others fosters thematic categorization.

In sum, previous studies conducted in Western cultural contexts provide converging evidence that having power fosters processing of information relevant to the task and of focal objects and their central features independently from the surrounding contexts. On the other hand, not having power
or adjusting to others has been shown to facilitate processing of both relevant and irrelevant information and of the relationship between focal objects and their surrounding contexts.

3.2. Culturally contingent cognitive consequences of power

3.2.1 Cultural differences in imperatives

As reviewed in the previous section, studies conducted in Western cultural contexts showed that power fosters goal-relevant, analytic cognitive processing. Does power have the same effects across cultures? In order to predict the effects of power on behavior, one needs to know the nature of distal-level social structures in which power is located and how individuals interpret and exercise power in relation to their goals, values, and beliefs. If different social structures provide different meanings to power and require different tasks for individuals to exercise power, power may have different effects on individuals across cultures.

Cross-cultural theorists have suggested that different sociocultural environments prescribe different tasks and imperatives for individuals (Markus & Kitayama, 1991; Triandis, 1995). In independent cultural contexts, such as the United States, the primary imperative is to pursue self-set goals independently from social contexts. On the other hand, in interdependent cultural contexts, such as Japan, the primary imperative is to fit into one’s roles and social contexts by attending to surrounding needs. For example, whereas influencing the surroundings according to one’s own goals and wishes is emphasized in independent cultural contexts, adjusting oneself to the surroundings is more emphasized in interdependent cultural contexts (Morling, Kitayama, & Miyamoto, 2002; Weisz, Rothbaum, & Blackburn, 1984).

Given cultural differences in primary imperatives, it is possible that in order to effectively exercise power, individuals need to engage in the imperatives that are emphasized and essential in the particular cultural context. That is, in order to effectively exert power in independent cultural contexts, people may need to focus on pursuing their own goals independently from social contexts. In contrast, in order to effectively exert power in interdependent cultural contexts, people may need to fit into their roles and social contexts by attending to others’ needs.

Supporting the contention that power is associated with the pursuit of own goals in independent cultural contexts, studies conducted in Western cultural contexts have suggested that participants primed with high power were more likely to engage in goal-directed behavior (Galinsky, Gruenfeld, & Magee, 2003) and less likely to take the perspective of others.
(Galinsky, Magee, Inesi, & Gruenfeld, 2006) compared to those primed with low power. On the other hand, cross-cultural research has shown that when describing the reason why they had influenced another person, Indians mainly focused on promoting the influencee’s benefits, whereas Americans mainly focused on promoting their own benefits (Savani, Morris, Naidu, Kumar, & Berlia, 2011). These findings suggest that whereas exerting power in independent cultural contexts involves pursuit of one's own goals, exerting power in interdependent cultural contexts involves more attention to others' needs.

Cross-cultural research on leadership has further suggested that people in positions of power are expected to act in a way consistent with their cultural imperatives (Kohn & Schooler, 1982; Naoi & Schooler, 1985; Smith, Misumi, Tayeb, & Peterson, 1989; Zemba, Young, & Morris, 2006). For example, paternalism is considered to be one of the characteristics of leaders in China, and leaders are thus expected to take care of their subordinates and pay attention to subordinates’ needs (Cheng, Chou, Wu, Huang, & Farh, 2004; Fu, Wu, Yang, & Ye, 2008). In addition, culturally contingent expectations about the actions of leaders manifest in how people represent the physical location of the leader in relation to the group (Menon, Sim, Fu, Chiu, & Hong, 2010). In the United States, where leaders are expected to act assertively upon the environment, participants represented leaders as standing ahead of groups (i.e., trailblazing). Alternatively, in Singapore, where leaders are expected to be responsible and protect the group, participants represented leaders as standing behind the group (i.e., trailing-behind). Thus, people seem to expect those who are in positions of power to act in line with their cultural imperatives. Furthermore, such different expectations about people in positions of power can be reflected in the values people in positions of power actually endorse. In large-scale survey studies, those who were in higher hierarchical positions in Japan endorsed more conformity of ideas and less personally responsible standards of morality (Naoi & Schooler, 1985), whereas there were no such associations in the United States (Kohn & Schooler, 1982).

Consistent with these culturally contingent representations of leaders and power, Zhong, McGee, Maddux, and Galinsky (2006) further showed that the concept of power is associated with different constructs across cultures. When the concept of power was activated among European Americans, their responses to words related to entitlement (e.g., earn, entitlement) were facilitated, whereas their responses to words related to responsibility (e.g., duty, responsibility) were inhibited. Asians and Asian Americans showed...
the opposite pattern: their responses to words related to responsibility were facilitated, whereas their responses to words related to entitlement were inhibited.

3.2.2 Cognitive consequences of power across cultures

The evidence reviewed in the previous section suggests that exerting power requires different imperatives across cultures. Whereas exerting power seems to require the pursuit of one’s own goals in Western cultural contexts, exerting power seems to require fitting into one’s role and attending to others’ needs in Eastern cultural contexts. Such culturally divergent imperatives associated with power are likely to foster different kinds of cognitive processing that serve the particular imperatives. Specifically, in Western, independent social environments, where the primary imperative is to pursue self-set goals, power may foster cognitive processing that helps individuals to focus on their goals without being distracted by peripheral or contextual information (i.e., analytic cognition). Indeed, as reviewed in the above section, previous studies conducted in Western cultural contexts provided support for this contention. On the other hand, in Eastern, interdependent social environments, where the primary imperative is to fit into one’s role and social contexts by attending to surrounding needs, power may foster cognitive processing that helps individuals attend not only to their own goals but also to surrounding contextual information (i.e., holistic cognition).

Supporting the possibility that processing of contextual information helps individuals fit into social contexts, studies have shown that attention to contextual information is linked to social adjustments as reviewed in Section 2.2. For example, participants who showed lower performance on the EFT, indicating higher attention to contextual information, also showed the tendency to mimic the nonverbal behavior of a target person (e.g., touching her face; Van Baaren et al., 2004). This suggests that individuals who attend to contextual information are more likely to align their behavior to others compared to those individuals who attend less to contextual information. In addition, processing of contextual information has also been linked to sensitivity to fear of isolation (Kim & Markman, 2006) and an other-focused manifestation of social anxiety (Norasakkunkit et al., 2012). These findings suggest the possibility that attending to contextual information helps individuals fit into social situations better.

Therefore, Miyamoto and Wilken (2010) hypothesized that exerting power in independent social environments would facilitate analytic cognitive processing, allowing people to focus on pursuing their own goals.
On the other hand, exerting power over others in interdependent social environments would foster holistic cognitive processing, allowing people to attend to others and fit into social contexts. To test this contention, the first study was conducted to examine how individual differences in cognitive style are related to individual differences in the orientation to interpersonal influence or adjustment by recruiting both American and Japanese participants (Miyamoto & Wilken, 2010, Study 1). It was predicted that, in the United States, participants who are oriented toward interpersonal influence would show a more analytic cognitive style, whereas in Japan, the association would be absent or even reversed.

The orientation toward interpersonal influence or adjustment was assessed by using the Circumplex Scale of Interpersonal Values (Locke, 2000). The scale consisted of 64 items, and participants were asked to rate how important each of the items was for them when they were in interpersonal situations. Following previous studies (Tsai, Miao, Seppala, Fung, & Yeung, 2007), the tendency to value influencing others was measured by four items (e.g., “I have an impact on them”), while the tendency to value adjusting to others was measured by five items (e.g., “I do what they want me to do”). Cognitive style was assessed by the FLT (Kitayama et al., 2003).

As hypothesized, interpersonal influence was marginally negatively correlated \( r = -0.21 \) with the amount of error on the absolute task in the United States. Such findings indicate that American participants who were more oriented toward interpersonal influence were better able to focus on the focal line independently from the contextual frame and thus showed more analytic cognitive processing compared to those who were less oriented toward interpersonal influence. Such findings are consistent with the previous studies, showing the link between power and analytic cognition in Western cultural contexts. On the other hand, consistent with the prediction, interpersonal influence was positively correlated with the amount of error on the absolute task \( r = 0.23 \) in Japan, which suggests that Japanese participants who were oriented toward interpersonal influence showed more holistic cognitive processing compared to those who were less oriented toward interpersonal influence. A reversed pattern was observed for interpersonal adjustment: interpersonal adjustment was marginally positively correlated with the amount of error on the absolute task in the United States.
This suggests that American participants who were more oriented toward interpersonal adjustment showed more holistic cognitive processing, whereas such a link did not exist in Japan. Patterns of correlations for the relative task were also in the predicted directions for each culture, though none of the correlations were significant. These findings suggest that those who are oriented more toward interpersonal influence have divergent cognitive styles across cultures: they tend to have a relatively analytic cognitive style in the United States and a relatively holistic cognitive style in Japan.

To further test the hypothesis that exerting power facilitates different cognitive processing across cultures, in another study, power was manipulated by assigning American and Japanese participants to different roles through structured interactions (Miyamoto & Wilken, 2010, Study 2). Each participant was paired with another same-gendered participant to work on a structured communication task (Schober & Clark, 1989; Tsai et al., 2007). Participants were seated at opposite ends of a table. A small divider was placed in the middle of the table, which was low enough to allow participants to see their partner’s face but high enough to prevent them from seeing their partner’s side of the table. Participants were given the same set of cards of Tangram figures and were told that the goal of the task was to sort them in the same order as their partner. Then, they were randomly assigned to the role of either a leader or a matcher. The leader’s job was to decide how to order the cards and then to verbally describe them to the matcher. The matcher’s job was to figure out how the leader ordered the cards. After they completed the communication task, they worked on an ostensibly unrelated visual task, the FLT (Kitayama et al., 2003).

As a manipulation check, participants were also asked to rate the extent to which they influenced their partner (influence) and the extent to which they were influenced by their partner (adjustment) during the communication task. The manipulation check showed a significant two-way interaction between role (leader or matcher) and question type (influence or adjustment) interaction. Leaders reported influencing matchers more than matchers reported influencing leaders, whereas matchers reported being influenced by leaders more than leaders reported being influenced by matchers. This interaction was more pronounced for Japanese participants than for American participants, indicated by a significant three-way interaction between culture, role, and question type. However, the two-way interaction between role and question type was significant for both groups. This suggests that the manipulation of power worked in both cultures, though it was even more effective for Japanese participants than for American participants.
The amount of error on the FLT is shown in Figure 3.10. If participants were attending to contextual information, they should have made more errors on the absolute task and fewer errors on the relative task. Among American participants, there was a significant interaction between role (leader or matcher) and FLT (absolute or relative). That is, although participants, in general, made more errors on the absolute task than on the relative task, the difference between the absolute and relative task errors was smaller for leaders than it was for matchers, suggesting that leaders showed a more analytic cognitive processing than did matchers. On the other hand, among Japanese participants, there was no effect of role. Leaders showed as holistic cognitive processing as matchers did. Because the results of the manipulation check showed that the manipulation had a larger impact on Japanese participants than on American participants, the lack of manipulation effect on cognitive processing among Japanese is likely not due to the failure of the manipulation for Japanese. These findings show that whereas influencing others fosters an analytic cognitive style in the United States, influencing others fosters a cognitive style at least as holistic as adjusting to others does in Japan.

Figure 3.10 Amount of error on the Framed-Line Task (i.e., absolute and relative tasks) as a function of culture and the role participants were assigned to (Miyamoto et al., 2010, Study 2). The final, definitive version of this paper has been published in Psychological Science, 21/11, November 2010 by SAGE Publications Ltd. All rights reserved. © 2010 SAGE Publications Ltd.
Taken together, these two studies provide support for the contention that influencing others is linked to the type of cognitive processing that serves the cultural imperative. In American cultural contexts, influencing others fosters an analytic cognitive style, which possibly allows people to focus on the target of their own goals without being distracted by others. On the other hand, in Japanese cultural contexts, influencing others requires a cognitive style at least as holistic as adjusting to others does, which may allow people to attend to the demands of others and to fit into social contexts. Such findings not only illustrate that cognitive styles are shaped by the nature of interpersonal contexts but also show that how they are shaped depends on cultural contexts which prescribe meaning to interactions, providing evidence for culturally contingent situated cognition (Culture × Situation × Person interaction; Cohen, 2007; Hong & Mallorie, 2004).

3.2.3 Future directions for research on culturally contingent cognitive consequences of power

These studies on culturally contingent consequences of power are based on the assumption that cultural differences in primary imperatives partly guide cultural differences in cognitive consequences of power. That is, power fosters analytic cognitive processing in independent cultural environments presumably because in order to effectively exert power in such cultural environments, people need to focus on pursuing their own goals, which should foster analytic cognitive processing. On the other hand, power fosters holistic cognitive processing in interdependent cultural environments, presumably because effectively exerting power in such cultural environments requires people to fit into roles and attend to social contexts, which should foster holistic cognitive processing.

Based on this reasoning, power should lead to holistic cognitive processing even in Western, independent cultural environments when people need to fit into roles and attend to social contexts in order to exert power. Partially supporting this possibility, Goodwin et al. (2000) found that, although powerful participants more selectively paid attention to stereotype-confirming information than to stereotype-disconfirming information, powerful participants increased attention to stereotype-disconfirming information and attended to both types of information equally when they were induced to feel responsible toward others (also see Torelli & Shavitt, 2010). If selective attention to information that is focal and consistent with the salient category partly reflects analytic cognitive processing, such findings imply that activating the need to attend to others diminishes analytic cognitive processing and fosters holistic cognitive processing.
processing. It would be informative for future research to directly test such a possibility by manipulating the need to attend to others while exerting influence over others and examining its consequences on holistic cognitive processing.

There could also be a distal sociostructural mechanism underlying cultural differences in cognitive consequences of power. Power was defined here as the capacity to influence others (Dahl, 1957; French & Raven, 1959; Vescio et al., 2003). According to this definition, structural properties of social relations (e.g., asymmetrical control over resources or outcomes; Fiske, 1993; Fiske & Dépret, 1996; Keltner et al., 2003; Thibaut & Kelley, 1959) are considered to be sources of power. It is possible that cultural differences in cognitive consequences of power are partly rooted in cultural differences in structural properties of social relations. That is, in Japanese social structures, those who are in positions of “power” might typically have less control over the outcome of those who are not in positions of “power” compared to the case in the United States. For example, compared to Western countries, the prime minister in Japan plays a smaller role in budget politics, while opinions of lower level bureaucrats occasionally can have large impact on the budget (Campbell, 1977). This suggests that even Japanese individuals may become analytic if they are placed in positions where they have complete control over the outcome and others have no control.

When considering mechanisms, it is also important to distinguish social power from personal power. Social power is about the exercise of power over others in interpersonal relationships, whereas personal power is about one’s ability to carry out actions or agency (Overbeck & Park, 2001). In the current theorization, power was mainly conceptualized as social power. Specifically, it was reasoned that exerting power over others fosters holistic cognitive processing in Japan because people need to attend to others and social contexts in order to effectively exert power in interdependent cultural environments. If attention to interpersonal contexts is the main reason for social power to foster holistic cognitive processing in Japan, personal power may not foster holistic cognitive processing even in Japan because there are no interpersonal contexts to which to attend. Thus, regardless of culture, it is possible that when people are exercising personal power, they tend to focus on their own goals, leading to analytic cognitive processing. Consistent with this possibility, recent research showed that, after being deprived of control, a form of personal power, both Chinese and Caucasian participants became analytic in their cognitive style in order to regain control over the environment (Zhou, He, Yang, Lao, & Baumeister, 2012).
Personal power is also related to social class. Middle-class individuals tend to have a higher sense of control and more resources to influence the environment, whereas working-class individuals tend to have a lower sense of control and more of a need to adjust to the environment (Lachman & Weaver, 1998; Snibbe & Markus, 2005). As reviewed in Section 2.1, previous studies have shown an association between social class and cognitive styles (Kraus et al., 2009; Miyamoto & Ji, 2011; Na et al., 2010). For example, using data from a large-scale survey, Miyamoto and Ji (2011, Study 3) showed that individuals with higher educational attainment and higher income made more taxonomic categorization, indicating more analytic cognitive processing, than did individuals with lower educational attainment and lower income, and a sense of agency partially mediated such social class differences in categorization. It would be fruitful for future research to examine whether social class has the same or different cognitive consequences across cultures. If personal power is associated with more analytic cognitive processing across cultures, middle-class individuals are likely to show an analytic cognitive style across cultures. In fact, research done in the United States and Russia found that college students from middle-class backgrounds tend to show a more analytic cognitive style compared to those from working-class backgrounds (Grossmann & Varnum, 2011).

3.3. Summary
In summary, power has been shown to be a proximal-level situational factor that has culturally divergent cognitive consequences. In Western, independent social structures, where the primary imperative is to pursue self-set goals, power fostered analytic cognitive processing, whereas in Eastern, interdependent social structures, where the primary imperative is to be attentive to others’ needs and fit in, power fostered holistic cognitive processing. The cultural moderation of the effect of a proximal-level situational factor suggests the importance of taking multiple levels of cultural influences into consideration because the effect of a particular factor can depend on factors at different levels in the larger cultural system.

4. IMPLICATIONS AND FUTURE DIRECTIONS
In this chapter, multilevel analysis of cultural influences is proposed as a useful approach to understand both how distal-level societal factors influence individuals’ cognitive processing through proximal-level processes and how factors at different levels interact to influence individuals’ cognitive
processing. A wide range of studies showing cultural differences in cognitive processes were reviewed in an attempt to illustrate the nature and scope of cultural differences. However, such evidence of cultural differences in cognition does not specify why there are cultural differences in cognition to begin with. To understand how culture influences cognition, multilevel analyses of factors underlying cultural influences were outlined, especially by highlighting the proximal-level processes through which distal societal factors influence individuals’ cognitive processes. Lastly, studies on culturally contingent cognitive consequences of power were reviewed in order to illustrate a case where the effect of a proximal-level factor depends on distal-level factors.

Much remains to be learned about relationships between factors at multiple levels. All the arrows in Figure 3.6 are bidirectional, indicating the assumption that factors are mutually shaping and influencing each other. Thus, for example, cognitive processing of individuals is assumed to be not only an outcome of participation in interdependent or independent proximal contexts but also a factor that shapes and influences interdependent or independent proximal contexts. If holistic cognitive processing fosters attention to others and social contexts and if analytic cognitive processing fosters attention to the self, then such divergent cognitive processing is likely to influence social interactions and practices. Consistent with this possibility, one study showed that when primed with holistic cognitive processing, participants were more likely to mimic the non-verbal behavior of an experimenter than they did when they were primed with analytic cognitive processing (Van Baaren et al., 2004). Similar additional future explorations will shed light on the functions of different types of cognition processing in social interactions.

Another direction for future research is to examine the longitudinal effects of exposure to proximal-level situational factors. Most evidence on the effects of proximal contexts on cognitive processes is based on short-term exposure to proximal contexts. It is thus an open question whether prolonged exposure to new proximal contexts can cause chronic changes in cognitive styles. One study found that the length of participation in Oriental medicine training practices, which embody a holistic and dialectical worldview, was associated with a holistic cognitive style (Koo & Choi, 2005), thus showing the long-term effects of a proximal factor. Longitudinal examination of individuals who have moved to different cultural contexts would also provide an opportunity to test whether exposure to new proximal contexts can lead to chronic changes in cognitive styles and thus test the malleability of chronic cognitive styles. Interestingly, studies that examined
longitudinal effects of exposure to North American culture on identification with North American culture have found mixed results (Cheung, Chudek, & Heine, 2011; Minoura, 1992). Whereas those who immigrated to North America earlier in their life showed changes in their identification as a function of their exposure to North American culture, those who immigrated later in their adolescence showed no changes in their identification, implying that there might be a sensitive period. Examination of whether and when cognitive processing changes in response to prolonged exposure to a new cultural context will contribute to a better understanding of cultural influences as well as cognitive processes.

As evidence documenting cultural differences in cognitive processes has been accumulated over the past decade, questions guiding research have also evolved. In addition to identifying the existence of cultural differences, researchers have examined moderating factors (“when”) and mechanisms (“how”) at multiple levels. Although there is much to be learned from asking “when” and “why” questions, exclusive focus on either “when” or “how” questions might lead to an understanding that is either too dispersed or too generalized. Especially, in a complex system like culture that is comprised of multiple levels, how a certain factor influences another factor can be moderated by factors at a different level. By integrating “when” and “how” questions into a single framework through highlighting proximal-level processes and examining how the effect of a proximal-level factor depends on distal-level factors, it is my hope that multilevel analyses provide a fruitful way to understand the cultural grounding of cognition.

REFERENCES


