Attending Holistically Versus Analytically: Comparing the Context Sensitivity of Japanese and Americans

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Much research indicates that East Asians, more than Americans, explain events with reference to the context. The authors examined whether East Asians also attend to the context more than Americans do. In Study 1, Japanese and Americans watched animated vignettes of underwater scenes and reported the contents. In a subsequent recognition test, they were shown previously seen objects as well as new objects, either in their original setting or in novel settings, and then were asked to judge whether they had seen the objects. Study 2 replicated the recognition task using photographs of wildlife. The results showed that the Japanese (a) made more statements about contextual information and relationships than Americans did and (b) recognized previously seen objects more accurately when they saw them in their original settings rather than in the novel settings, whereas this manipulation had relatively little effect on Americans.

A well-established finding in the field of social cognition concerns the so-called *correspondence bias* or *fundamental attribution error*—the tendency to see behavior as a product of the actor's dispositions and to ignore important situational determinants. Cross-cultural studies show that Asians are more inclined to explain events situationally than are Americans. The reasons for this cultural difference, however, are unclear. In this article, we examine the differences in attentional patterns between Japanese and Americans and provide an explanation of differences in attribution based on differences in cognitive and perceptual orientations that Nisbett and his colleagues (Nisbett, Peng, Choi, & Norenzayan, 2001; Norenzayan & Nisbett, 2000; Peng & Nisbett, 1999) have labeled *holistic* and *analytic*.

Attribution and Culture

In an early study, Jones and Harris (1967) asked participants to read an essay allegedly written by another student that was either for or against an important social issue of the day. They were informed that the essayist had been required to take a pro or con stand by a political science instructor, a debate coach, or an experimenter. When asked to estimate the essayist's actual opinion, participants tended to ignore the situational constraints and inferred that the essayist's actual opinion corresponded to the content of the essay. A great deal of research carried out under the rubric of the attitude attribution paradigm indicates that this bias is robust (Gilbert & Jones, 1986; Gilbert & Malone, 1995; Jones, 1979; Ross, 1977).

These findings are consistent with the generalization that people tend to pay attention to others' behavior at the expense of environmental factors. In Heider's (1958) view, "behavior engulfs the field" (p. 54). Jones (1979) interpreted this to mean that the observed action and the actor are so salient that people tend to attribute outcomes to the actor's internal states and dispositions rather than to less salient situational factors. This claim has long been a common theme of social psychology. Gilbert and Malone (1995), for example, maintain that it is the lack of awareness of situational factors that is the cause of the correspondence bias.

The correspondence bias appears to be weaker in some non-Western cultures. Many studies indicate that Asians are inclined to explain the outcome of another person's behavior in terms of situational factors, whereas Americans are more likely to explain behavior in terms of presumed internal factors such as personality traits and other corresponding dispositional terms (Lee, Hallahan, & Herzog, 1996; Miller, 1984; Morris & Peng, 1994; Norenzayan, Choi, & Nisbett, 1999). Even when situational factors are made extremely salient—for example, in the Jones and Harris (1967) paradigm—Americans may still attribute behavior to dispositional factors, whereas East Asians' attributions are influenced by the same salience manipulations (Choi & Nisbett, 1998; Masuda & Kitayama, 2001; Toyama, 1990). In other studies, in which people

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This research was supported by the Culture and Cognition Program of the University of Michigan and by National Science Foundation Grant SBR 9729103. We thank Julia S. Carlson, Sara Clark, Trey Hedden, Keiko Ishii, Li-Jun Ji, Asuka Kato, Shinobu Kitayama, Jan Leu, Jeffery Lewis, Chinae Masuda, Elise Moultrup, David Ng, Brook Partner, Miho Saito, and Robert Yee for their assistance.

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Journal of Personality and Social Psychology, 2001, Vol. 81, No. 5, 922–934
 0022-3514/01/$5.00 DOI: 10.1037//0022-3514.81.5.922

were asked to read assigned descriptions of personal traits in front of observers, East Asians were less likely than Westerners to believe that the observers would infer that the participants' actual personal traits corresponded to the assigned descriptions (Kamada & Van Boven, 2000; Van Boven, Kamada, & Gilovich, 1999). Finally, East Asians are less likely than Westerners to believe that behavior normally corresponds to actual attitudes (Kashima, Siegal, Tanaka, & Kashima, 1992).

These findings suggest that East Asians' views about the causes of behavior and the importance of situational factors differ from those of Westerners. If so, we might expect that they would attend to different aspects of the environment. If people believe that causality is located in the environment, they might pay attention to the field as a whole and to the object's relationship with the field rather than focusing narrowly on the object.

Holistic Thought Versus Analytic Thought

Nisbett and his colleagues (2001) provided a theoretical model within which to consider such questions. They argued that there are significant psychological differences between East Asians and Westerners that are rooted in long-standing differences between East Asian and Western civilizations. Intellectual traditions in ancient Greece emphasized analytic thought, which can be defined as involving

> detachment of the object from its context, a tendency to focus on attributes of the object in order to assign it to categories, and a preference for using rules about the categories to explain and predict the object's behavior. Inferences rest in part on the practice of decontextualizing structure from content, the use of formal logic, and avoidance of contradiction. (Nisbett et al., 2001, p. 293)

Nisbett et al. maintained that contemporary Westerner's mentalities and systems of thought are highly influenced by such an analytic tradition.

By contrast, intellectual traditions in ancient China such as Taoism, Chinese Buddhism, and Confucianism are more holistic in character. Nisbett et al. (2001) defined holistic thought as involving

> an orientation to the context or field as a whole, including attention to relationships between a focal object and the field, and a preference for explaining and predicting events on the basis of such relationships. Holistic approaches rely on experience-based knowledge . . . and are dialectical, meaning . . . a search for the "Middle Way" between opposing propositions. (p. 15)

Nisbett et al. maintained that contemporary East Asians' mentalities and systems of thought are highly influenced by such a holistic tradition.

Nisbett and his colleagues (2001), following Witkin and Berry (1975), assumed that these cultural differences derive from the relative complexity of East Asian and Western societies. In complex societies such as ancient Chinese and other East Asian cultures, people were required to maintain close and well-structured relationships with other group members. Under these conditions, people need to be sensitive to relationships and to subtle changes in social situations. In contrast, in less socially complex and less role-constrained societies such as ancient Greece, people had more personal control over their environment. Under such circumstances, people are not required to examine all parts of the environment and can focus on a particular object and their own goals with respect to it. These characterizations of cultural models lead to several expectations about perception and attention among contemporary peoples, as East Asians still have generally interdependent societies and Westerners generally independent ones. For example, East Asians can be expected to see wholes where Westerners see parts. Moreover, East Asians might see relationships in a field more easily than Westerners can, but may find it more difficult to differentiate an object from the field.

Cross-Cultural Findings Concerning Human Attention

There is some evidence that the above hypotheses about perception are correct. For example, Abel and Hsu (1949) conducted an early study that supports the claim that the holistic approach to information processing among Asians is predominant. They demonstrated that, in their responses to the Rorschach test, Chinese Americans tended to emphasize all aspects of the card, or its overall Gestalt. In contrast, the European Americans were more likely to emphasize parts or single aspects of the pictures.

Similarly, Chiu (1972) examined cultural differences in categorization patterns between American and Chinese children. In his study, children were asked to group any two of three items that "belonged together," for example, a man, a woman, and a baby. The results indicated that Chinese children were more "relational–contextual" in their groupings, for example, grouping together a mother and a baby "because the mother takes care of the baby." In contrast, American children were much more likely to group objects on a "categorical" basis, for example, grouping the man and the woman together "because they are both adults."

The notion that cognitive and perceptual orientations can differ in the degree to which they are analytic versus holistic is related to the concept of field dependence (Witkin & Berry, 1975; Witkin & Goodenough, 1977). According to Witkin and his colleagues, some people can perceptually separate an object from the field in which it is embedded more easily than can others. Witkin et al. also argued that such perceptual tendencies are strongly influenced by economic and social factors. For example, Witkin and Berry (1975) maintained that some societies require analyzing the visual field in such a way as to avoid being thrown off by external cues. Hunters and herdsmen must analyze the features of novel information independent of context, whereas agriculturists can generally afford to merely scan the environment as a whole. Consistent with this logic, Witkin and Berry found that nonliterate hunters and herders have a more analytic or "field independent" style than do nonliterate farmers, performing better on the embedded figures test that requires ignoring the details of a complex stimulus figure and finding a smaller pattern "embedded" in it. Witkin and Berry also maintained that people who live in modern economies must be capable of substantial field independence. They found that modern Westerners are less field dependent than agriculturists and about as field dependent as hunters and herders.

Following Witkin's line of reasoning, Ji, Peng, and Nisbett (2000) examined the possibility that East Asians find more difficulty separating an object from the field in which it is embedded than do Americans. In their experiment, they used the Rod and Frame Test designed by Witkin and his colleagues (e.g., Witkin & Berry, 1975; Witkin & Goodenough, 1977), in which a frame

about 16-in. (approximately 41 cm) square is rotated independently of a rod that sits inside of the frame. The task is to report when the rod appears to be vertical. The degree to which judgments about the position of the rod are influenced by the position of the frame is an indication of degree of field dependence. East Asian participants, from China, Korea, and Japan, made more errors on the test than American participants. In another study, Ji et al. (2000) examined the ability of East Asians to detect covariation among stimuli. They assumed that East Asians would be sensitive to the covariation of the stimuli because they would be more attentive to relationships in the field than Americans would. In one experiment, Chinese and American participants were asked to judge the degree of association between arbitrary figures on a computer screen. Ji et al. manipulated the contingencies of two figures. The probability of one particular object being associated with another object corresponded to a correlation of .00, .40, or .60. The results indicated that Chinese participants reported a greater degree of covariation than did American participants, they were more confident about their judgment, their confidence judgments were better calibrated with actual covariation, and, unlike Americans, the Chinese were not subject to the error of overweighting pairings seen early in the presentation of stimuli.

Hypotheses

In this article we report studies examining the extent to which attention can be presumed to be holistic versus analytic. We examined memory for objects versus memory for the environment in which they had been displayed. We anticipated that (a) East Asians would attend to field information more than Americans would, and thus would recall more such information and (b) East Asians' perception of objects would be more "bound" to the context in which they were initially encountered than would that of Americans in the sense that objects would be seen and thus remembered in relation to their context (Chalfonte & Johnson, 1996). We conducted two experiments comparing Americans and Japanese. In Study 1, we presented underwater scenes and asked participants to describe them. We expected that the Japanese would notice more field information than would Americans, and would see more relationships in the environment. In a subsequent part of Study 1, and in Study 2, we presented a set of objects and asked participants whether they had seen them. The backgrounds for previously seen objects were either the original ones or novel ones. We expected that the Japanese would be more vulnerable to the change of backgrounds than would Americans because, for Japanese, perception of the object is bound to the environment in which it appears.

Study 1

In Study 1, participants were presented with vignettes of underwater scenes. Each scene was characterized by having "focal fish," which were large and had salient colors and shapes, moving in front of a complicated scene. After the scene was presented, participants were asked to report what they had seen. The recall patterns were then analyzed. We anticipated that (a) Japanese participants would report relatively more objects in the background environment than would American participants and (b) Japanese participants would report relatively more events involving relations between the focal fish and the environment.

In a subsequent part of the study, participants were presented with objects that had been either shown or not shown during the earlier part of the study. Participants were asked to indicate whether they had seen the objects before. The previously seen objects were shown with either the original background, a different background, or no background at all. The recognition patterns were then analyzed. We anticipated that the accuracy of Japanese participants would be hurt more by seeing objects on a novel background than would that of American participants, and that it would be helped more by seeing them on the original background.

Method

Participants

Thirty-six American participants at the University of Michigan and 41 Japanese participants at Kyoto University, Kyoto, Japan, participated in the experiments as a course requirement. The 36 American participants consisted of 33 Caucasians and 3 African Americans.

Materials

In the first phase of the study, 10 animated vignettes of underwater scenes were presented using Macro Media Director, Version 6 (Macromedia, San Francisco; see Figure 1). The same 17-in. (about 43 cm) monitors (Macintosh Color Monitor, Apple, Cupertino, CA) and computers (Macintosh G3, 233mhz) were used in the laboratories in the United States and in Japan. In each different vignette, along with the various salient focal fish, there were other actively moving but smaller objects such as water animals, bubbles, and relatively small fish, which had little detail and appeared to be in the background of the scene. In addition, scenes included inert objects such as vegetation and rocks and nonmoving animals such as shells and snails. Finally, each vignette had a particular background color—seemingly the color of the water. The participants sat on a chair and put their chin on a device to standardize the distance between the monitor and their face. The distance was 15 in. (38.1 cm).

In the second phase of the study, participants saw pictures of 45 objects that had actually appeared in the previous phase (previously seen objects). These objects included 23 focal fish, seven animals that were moving

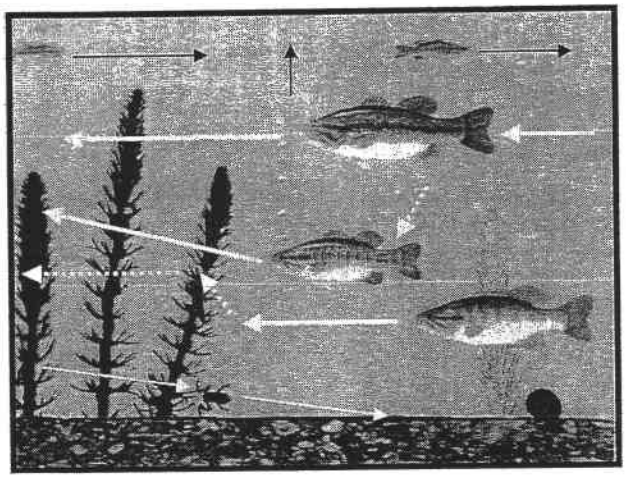


Figure 1. An example of animated vignettes in Study 1. The arrows refer to the directions of the figures' movements.

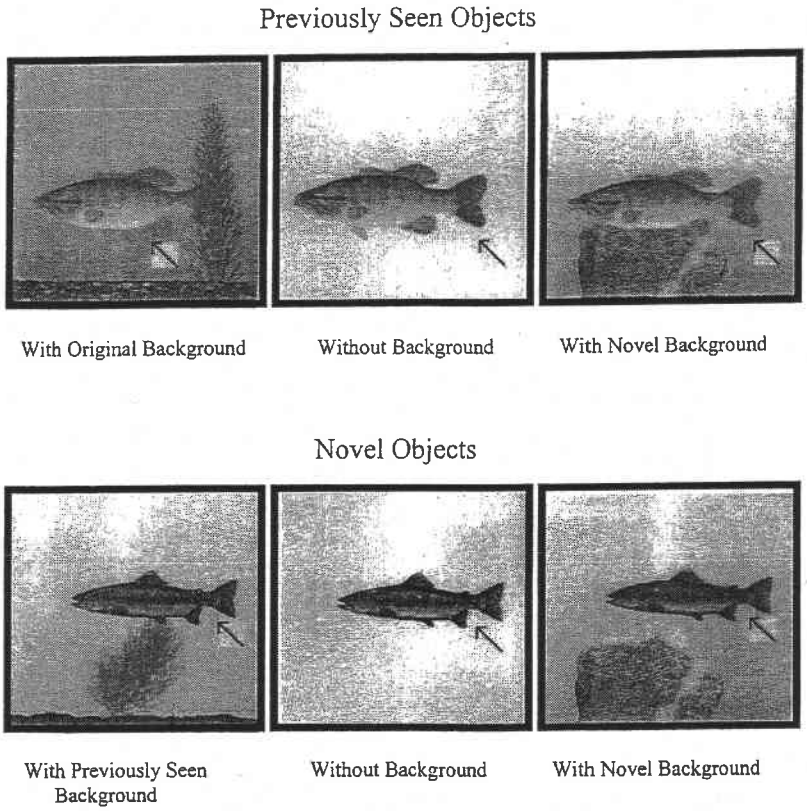


Figure 2. Examples of figures used as stimuli for the second session in Study 1.

actively in the previous vignettes such as frogs and newts, eight animals that did not move in the previous vignettes such as shells, and seven field objects such as vegetation and rock formations. The participants also saw pictures of 45 objects that had not appeared in the previous phase (novel objects). We manipulated the combination between the objects and the background information (see Figure 2). Each object could have one of three different backgrounds: (a) the original background, that is, the scenery that appeared in the previous vignettes; (b) no background, that is, a plain white background; or (c) a novel background, that is, scenery that did not appear in the previous vignettes. In sum, there were six different conditions: (a) previously seen objects with original backgrounds, (b) previously seen objects with no background, (c) previously seen objects with novel backgrounds, (d) novel objects with previously seen backgrounds, (e) novel objects with no backgrounds, and (f) novel objects with novel backgrounds.

Procedure

Recall task. In the first phase, the experimenter met participants individually and escorted them to a room equipped with a computer, a monitor, and a tape recorder. The experimenter said that participants would see several animated vignettes and would be asked to answer questions on the basis of what they had seen. The participants saw the identical vignette twice. Each vignette lasted about 20 s. Timing was identical in the United States and in Japan. When the initial presentation of a vignette was finished, the screen was wiped out, and the identical vignette began subsequently. After the second presentation of the vignette, the screen was again erased, and participants were asked, "What did you see in the animation? Please describe it, taking as much as 2 min." The participants responded to the question orally, and their responses were recorded. Participants watched two practice vignettes and responded to questions for both vignettes. If they did not have any questions or problems about procedure, the experimenter proceeded. Participants then watched eight vignettes.

Data coding. The recorded data were transcribed and divided into segments corresponding to the smallest linguistically meaningful element.[1] Two bilingual Japanese translated the Japanese data into English and the English data into Japanese. A bilingual Japanese and two Americans checked the correspondence of these translations. A Japanese speaker then divided the Japanese data into segments. Similarly, an English speaker divided the English data into segments. The average agreement on the appropriate division for each utterance was 97%. Disagreements about segmentation were corrected by the same coders.

Subsequently, two Japanese coders and two English coders independently coded the data. The two Japanese coders coded the Japanese data and the translated English data, and the two English coders coded the English data and the translated Japanese data. The agreement of the two English coders was 95%, and the agreement of the two Japanese coders was 96%. Disagreements about coding were corrected by the coders and Takahiko Masuda by referring to coding rules.

Finally, Japanese coders and English coders were compared, and agreement between them was found to be 94%. Disagreements about codes were corrected by Takahiko Masuda on the basis of the coding rules. The Japanese and the English codes were combined into a single score. This final score was used for the data analysis.

The data were coded as belonging to one of the following categories: (a) focal fish, (b) background fish, (c) active animals, (d) inert animals, (e) plants, (f) bubbles, (g) floor of scene, (h) water, and (i) environment. These categories are defined in Figure 3. The categories were grouped into four superordinate categories. Focal fish remained an independent category.

[1] Repetitions of the same phrase were not counted.

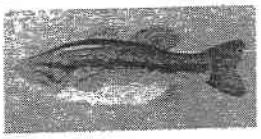
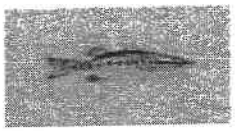
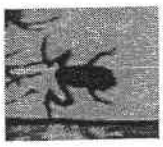
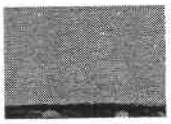
Category	Definition	Picture
FOCAL FISH	Large fish with salient shape and color moving actively at the foreground of the scene.	
BACKGROUND FISH	Fish with unclear shapes and pallid colors Moving slowly at the background of the scene. Example: muted trout	
ACTIVE ANIMALS	Small figures with salient shape and colors moving actively at the foreground of the scene. Example: frog, newt, and salamander	
INERT ANIMALS	Background figures with little or no movement Example: seashell and mollusk	
PLANTS	Water vegetation situated in the background of the scene. Example: lotus, seaweed	
BUBBLES	Bubbles moving vertically, horizontally, or diagonally, in a constant or intermittent pattern.	
FLOOR OF SCENE	Rocks and other materials at the bottom part of the screen	
WATER	Background colors, current, flow	
ENVIRONMENT	Other background information that referred to the context. Example: tropical sea, lake, and pond	

Figure 3. Categories of objects in the scene.

Background fish and active animals were grouped and named *active objects*, representing peripheral but moving objects. Inert animals and plants were categorized as *inert objects*. Finally, bubbles, floor of scene, water, and environment were categorized as *background*. In addition, as may be seen in Table 1, each category could be coded in a variety of ways: (a) simple description, (b) number, (c) attributes, (d) feeling, (e) behavior, (f) location, (g) relation to active objects, (h) relation to inert objects, and (i) time.

Figure 4 presents examples of segmentation and coding. The sentence, "I saw three big fish swimming from right to left," was segmented into "I saw three," "big," "fish," "swimming," and "from right to left." Subsequently, data coders coded each segment as *number*, *attributes*, *simple description*, *behavior*, and *location*. In addition, coders needed to find a subject noun of the sentence. In this example, the subject of the sentence was "fish." Therefore, it was coded as focal fish. Subsequently, codes of each subcategory were accumulated as focal fish codes, with the total codes in this case being five. Similarly, segmentation coders split the sentence "At the beginning, a big fish was swimming towards the green seaweed" into "at the beginning," "a big," "fish," "was swimming," "towards," "the green," and "seaweed." In this example, there are two nouns, "fish" and "seaweed." Codes of each subcategory were accumulated for focal fish and plants, respectively. That is, "at the beginning," "a big," "was swimming," "fish," and "towards" were accumulated as focal fish codes. "The green" and "seaweed" were accumulated as plants.

Recognition task. In the second phase, the participants were presented with a recognition task that they had not been told to expect. They were asked to look at the screen as they did in the first phase. The experimenter told the participants that they would see 90 objects and that their task was to identify the objects that had actually appeared in the previous vignettes and to evaluate their degree of confidence about these judgments on a 7-point scale. The participants were asked to circle "Yes" or "No" (or "Hai" ka "Iie") to indicate whether they had previously seen the objects.

Table 1
Codes Applied to Categories

Code	Definition	Examples
Simple description	Reference to the basic name of the objects	Fish, black bass, frog, bubbles, seashells, sea weeds, rocks, lake, pond, sea
Number	Reference to the number of the objects	Two, five
Attributes	Reference to the color, the shape, or other physical attributes	Big, small, large, short, red, yellow, striped, dotted, sharp
Feeling	Reference to feeling of animals or nonphysical states	Angry, anxious, afraid, comfortable
Behavior	Reference to locomotion	Swimming, going, moving
Location	Reference to the objects' position	At the bottom, from the left to the right, at the foreground
Relation to active objects	Reference to a relationship with active objects	Next to (the fish), near (the frog), toward (the fish)
Relation to inert objects	Reference to a relationship with inert objects	On (the seaweed), near (the shells), toward (the water weed)
Time	Reference to time	At the beginning of the animation, at the end of the animation

The participants were asked to rate their level of confidence using a 7-point scale ranging from 1 (*not at all confident/Mattaku Jishin ga Nai*), to 7 (*extremely confident/Hijyouni Jishin ga Aru*).

Results and Discussion

Recall Task

Attention to field. We present in detail the analysis of four variables: focal fish, active objects, inert objects, and background. We counted the number of statements in each category. Four independent *t* tests were examined to compare Japanese participants' reports in each category to those of Americans. As may be seen in Table 2, Japanese participants recalled more background information than did American participants, $t(75) = 2.34$, $p < .05$.[2] In addition, the Japanese participants recalled more information about inert objects than did American participants, $t(75) = 3.93$, $p < .001$. In contrast, there were no significant differences for focal fish, $t(75) < 1$, or active objects, $t(75) = 1.59$, *ns*. Thus, the recall tasks revealed that Japanese participants were more likely to mention relatively peripheral, nonsalient, or background information than were American participants.

We analyzed the first sentences of participants' statements because we assumed that the first sentences would represent information regarded as particularly important. We anticipated that American participants would start their recall statement with focal objects, whereas Japanese participants would start with field information. For this further analysis, focal fish and active objects were collapsed into a variable called "salient objects." Inert objects and background were collapsed into a variable called "field." As is shown in Table 3, there were marked differences among participants' first sentences. American participants started their statements by mentioning salient objects far more frequently than Japanese participants did, $t(75) = 3.36$, $p < .001$. In contrast, Japanese participants started their statements by mentioning field information almost twice as often as American participants did, $t(75) = 3.47$, $p < .001$.

Attention to relationships. We distinguished statements that referred to relationships with active objects from statements that referred to relationships with inert objects. If participants stated that an object moved or was located in relation to focal fish and active objects, this was coded as "relation to active animal." If participants stated that a subject of a sentence related to inert objects or background, this was coded as "relation to field." The results in Table 4 show that Japanese participants made almost twice as many statements referring to relation to field as did American participants, $t(75) = 3.58$, $p < .001$. However, there were no significant differences for relation to active animal, $t(75) < 1$. These results are consistent with our hypothesis that Japanese people would recall more relationships in the environment than would Americans, especially relationships involving static, nonsalient aspects of the environment.

In addition, the results revealed that Japanese participants made more behavior-related observations ($M = 52.85$, $SD = 19.67$) than did American participants ($M = 40.67$, $SD = 21.61$), $t(75) = 2.59$, $p < .05$. For example, Japanese participants were more likely than American participants to mention behavior-related comments such as "the fish are swimming" and "a frog is climbing on seaweed" in their descriptions, whereas American participants tended to simply describe the physical appearance of the objects such as "there are five big fish" and "there is a frog." These findings also support our view that East Asians are more attentive than Americans to the behavior of objects because they are more likely to notice relationships.[3]

Additional findings. Japanese participants made more time-related comments ($M = 5.78$, $SD = 4.02$) than did American participants ($M = 2.83$, $SD = 3.41$), $t(75) = 3.45$, $p < .001$. Japanese participants tended to make more descriptions such as "at the beginning of animation," "on the way," and "at the end of this animation." The proportion of Japanese participants who made feeling-related comments was significantly greater than the pro-

[2] All *p* values are based on two-tailed tests.

[3] Nisbett et al. (2001) noted that holistic thought encourages people to have a worldview in which all kinds of events and phenomena are interrelated and perpetually changing. This implies that East Asians, as holistic thinkers, are more attentive to the behavior or flow of objects. In contrast, Americans are inclined to think that objects have properties that are stable over time and across context. Several studies support these assumptions. American toddlers show a "noun bias," learning words describing objects at a more rapid rate than verbs, which describe relationships (Gentner, 1982). However, Tardif (Tardif, 1996; Tardif, Gelman, & Xu, 1999) has shown that Chinese toddlers learn verbs (i.e., words describing relationships) at a more rapid rate than American toddlers do.

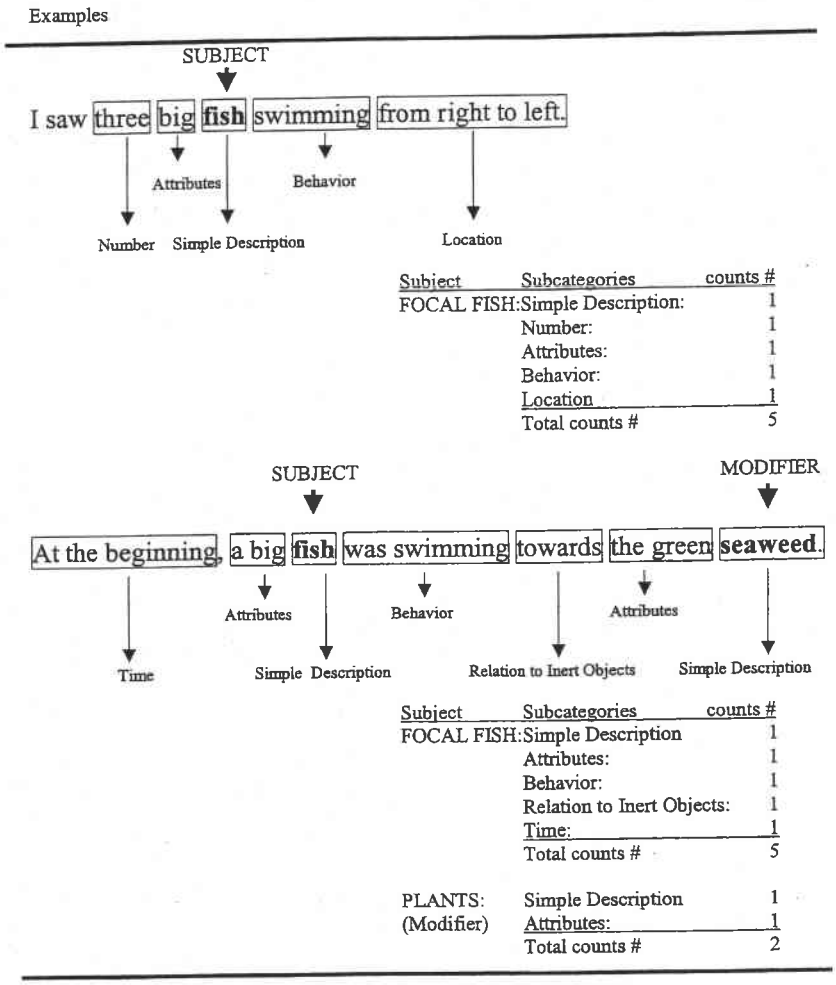


Figure 4. Examples of segmentation and coding.

portion of American participants, $\chi^2(1, N = 75) = 4.90$, $p < .05$. For example, Japanese participants stated "a turtle was swimming comfortably" and "the red fish must be angry because its scales were hurt." The results, however, did not show cultural differences in observations about number, $t(75) = 1.18$, *ns*, attributes, $t(75) = 1.01$, *ns*, or location, $t(75) = 1.37$, *ns*.

Recognition Task

We anticipated that Japanese recognition of objects would be affected by the backgrounds against which they were displayed. If Japanese participants perceptually bind objects to contextual information more than American participants do, Japanese participants' memory for previously seen objects should be more accurate if the objects are presented with the original background than when they are presented on a potentially misleading novel background. In contrast, we anticipated that American participants would be more likely to decontextualize the objects from the backgrounds. Therefore, the changes should matter less for American accuracy. We prepared novel objects to construct the recognition task, but we did not expect accuracy for these objects to differ for Japanese and Americans as a function of background.

A 2 (culture) × 3 (background) analysis of variance (ANOVA) for accuracy about previously seen objects revealed that there was no significant interaction, $F(2, 75) = 2.14$, *ns*.[4] This result, however, was qualified by the planned analyses in each culture. As

[4] Each object for the recognition task was presented only once. Otherwise participants might be confused as to whether they saw the objects in the recall task or in the recognition task. For this reason, a Latin square design was used to analyze the data. The participants were divided into three groups randomly: Group A, Group B, and Group C. In addition, object stimuli were also divided into three groups randomly: Objects 1, Objects 2, and Objects 3. Participants in Group A saw Objects 1 with original (previously seen) backgrounds, Objects 2 with no backgrounds, and Objects 3 with novel backgrounds. Participants in Group B saw Objects 1 with no backgrounds, Objects 2 with novel backgrounds, and Objects 3 with original backgrounds. Participants in Group C saw Objects 1 with novel backgrounds, Objects 2 with original backgrounds, and Objects 3 with no backgrounds. We combined over stimulus sets and participant groups to simplify the analyses.

Table 2
Numbers of Accounts of Scenes in Each Category for American and Japanese Participants

	American			Japanese		
Category	*M*	*SD*	*n*	*M*	*SD*	*n*
Background	20.11	19.68	36	30.88	20.51	41
Inert objects	38.22	24.62	36	65.39	34.44	41
Active objects	77.42	34.39	36	89.76	33.50	41
Focal fish	117.91	60.12	36	130.32	58.05	41

Note. The number of accounts in each category was compared independently.

shown in Figure 5, the accuracy rates of Japanese participants varied significantly as a function of the background conditions, $F(2, 75) = 6.95$, $p < .001$. When Japanese participants judged previously seen objects with their original backgrounds, their accuracy was greater than when they judged previously seen objects with novel backgrounds, $t(75) = 3.75$, $p < .001$. In addition, their accuracy with no backgrounds was greater than that with novel backgrounds, $t(75) = 2.27$, $p < .05$. There was no significant difference between accuracy with no background and accuracy with the original background, $t(75) = 1.21$, *ns*. In contrast, the accuracy rates of American participants' judgments were not affected by the manipulation, $F(2, 75) = 1.91$, *ns*. Thus, the recognition task revealed that the Japanese were more likely to bind object and field in memory and to be influenced by the manipulation of the backgrounds than were Americans.[5]

Study 2

The geographical territory of Japan consists of islands surrounded by ocean. For this reason, the Japanese might be expected to be highly familiar with types of fish. Americans, especially Midwestern Americans, might be less familiar with types of fish. To generalize our findings, therefore, it seemed advisable to replicate these results using a different object domain. We selected a set of American animals and American scenery; we assumed that American participants would be more familiar with the animals than were the Japanese. We anticipated that the Japanese would nevertheless be more influenced by changes in the backgrounds than would Americans.

In addition, and more importantly, we manipulated the size of the backgrounds, and kept them constant both in learning and recognition tasks. In Study 1, we used backgrounds that covered the whole screen in the initial presentation of the scenes, but in the recognition task used only small segments of the original backgrounds. This likely meant that the backgrounds in the recognition task would have been less salient than the objects that participants were supposed to judge. It would be interesting to see what would happen if background salience were set at a different parameter such that American accuracy was also influenced by the nature of the background. Under such circumstances, would we find that Japanese would still be more influenced by the background than would Americans? In Study 2, we made the backgrounds much more obviously different from one another than in Study 1. In addition, we presented backgrounds in such a way that they covered the whole screen. We anticipated that such salient backgrounds might cause binding between object and field even for Americans, but that their recognition accuracy would be less harmed by novel background than would that of the Japanese.

Finally, we measured reaction time for judgments. We anticipated that Japanese would bind the objects to the backgrounds spontaneously. The Japanese therefore would make judgments much faster when they were judging previously seen animals with their original backgrounds than when they were judging previously seen animals with novel backgrounds. We expected, however, that because Americans would pay relatively little attention to the backgrounds, their judgment speed would be more similar for these two conditions.

Participants were asked to rate how much they liked the animals. The participants did not know in advance that they would be asked to make recognition judgments. After a filler task, the participants were asked to indicate whether they had seen the objects before or not. The previously seen animals were shown either with the original backgrounds or the novel backgrounds. Novel animals were also shown either with previously seen backgrounds or with novel backgrounds.

Table 3
Subject of the First Sentence in Descriptions of Scenes by American and Japanese Participants

	American			Japanese		
Category	*M*	*SD*	*n*	*M*	*SD*	*n*
Salient objects	5.77	2.43	36	3.78	2.74	41
Field	2.14	2.42	36	4.20	2.73	41

Note. The number of accounts in each category was compared independently.

Table 4
The Accounts of Relational Categories in Descriptions of Scenes by American and Japanese Participants

	American			Japanese		
Category	*M*	*SD*	*n*	*M*	*SD*	*n*
Relation to active animal	8.97	6.78	36	9.15	7.94	41
Relation to field	7.22	6.55	36	13.51	8.55	41

Note. The number of accounts in each category was compared independently.

Method

Participants

Forty-one American participants at the University of Michigan and 44 Japanese participants at Kyoto University participated in the experiments as a course requirement.

[5] The results for the confidence ratings were not significant: There was neither a significant main effect of culture, $F(1, 75) = 1.17$, *ns*, a main effect of background, $F(2, 75) = 1.44$, *ns*, nor an interaction, $F(2, 75) = 1.72$, *ns*.