Research Article

PERCEIVING AN OBJECT AND ITS CONTEXT IN DIFFERENT CULTURES: A Cultural Look at New Look

Shinobu Kitayama,[1] Sean Duffy,[2] Tadashi Kawamura,[1] and Jeff T. Larsen[3]

[1]Kyoto University, Kyoto, Japan; [2]University of Chicago; and [3]Texas Tech University

Abstract—*In two studies, a newly devised test (framed-line test) was used to examine the hypothesis that individuals engaging in Asian cultures are more capable of incorporating contextual information and those engaging in North American cultures are more capable of ignoring contextual information. On each trial, participants were presented with a square frame, within which was printed a vertical line. Participants were then shown another square frame of the same or different size and asked to draw a line that was identical to the first line in either absolute length (*absolute task*) or proportion to the height of the surrounding frame (*relative task*). The results supported the hypothesis: Whereas Japanese were more accurate in the relative task, Americans were more accurate in the absolute task. Moreover, when engaging in another culture, individuals tended to show the cognitive characteristic common in the host culture.*

Although perception depends on sensory input, it also involves a variety of top-down processes that are automatically recruited to actively construct a conscious percept from the input. According to this thesis, called *New Look* in the 1950s, the percept is significantly modified by expectations, values, emotions, needs, and other factors that are *endogenous* to the perceiver (Bruner, 1957; Bruner & Goodman, 1947). *Exogenous* factors, such as physical properties of the impinging stimulus, cannot account, in full, for the emerging percept. Although initial demonstrations evoked considerable controversy and skepticism (e.g., Postman, Bronson, & Gropper, 1953), the basic idea has proved quite viable (Erdelyi, 1974; Niedenthal & Kitayama, 1994; Zajonc, 1980), and has since taken a strong hold in the mainstream of cognitive and social psychology (Higgins & Bargh, 1987).

In large part, however, this literature has so far ignored culture. This omission is both surprising and unfortunate. As a pool of ideational resources (e.g., lay theories, images, scripts, and worldviews) that are embodied in public narratives, practices, and institutions of given geographic regions, historical periods, and groups, whether ethnic, religious, or otherwise (Kitayama, 2002), culture may be expected to be one source, and perhaps the most fundamental source, of each person's values, expectations, and needs. The purpose of the current work, then, was to take a renewed look at the New Look from a cultural point of view.

CULTURE AND COGNITION

A number of recent studies focusing on cultural variation in cognitive processes have already shed some light on this issue. As a whole, these studies suggest that different cultures foster quite different modes of cognitive processing (Kitayama, 2000; Markus & Kitayama, 1991; Nisbett, Peng, Choi, & Norenzayan, 2001). In particular, people engaging in North American cultures (North Americans, in short) are assumed to be relatively more attuned to a focal object and less sensitive to context. North Americans are thus described as analytic (Nisbett et al., 2001) or field independent (Witkin & Berry, 1975) in cognitive style. Conversely, persons engaging in Asian cultures (Asians, in short) are hypothesized to be attuned more to contextual information—namely, information that surrounds the focal object. Asians are thus described as holistic or field dependent in cognitive style. These culturally divergent cognitive characteristics have been examined with several different measures, such as attitude attribution (e.g., Masuda & Kitayama, 2002; Miyamoto & Kitayama, 2002), performance in a rod-and-frame task (RFT; Ji, Peng, & Nisbett, 2000; Witkin & Berry, 1975), a Stroop interference effect (Ishii, Reyes, & Kitayama, 2003; Kitayama & Ishii, 2002), and context-dependent memory (Masuda & Nisbett, 2001). A reasonable conjecture from this emerging literature is that the cross-culturally divergent modes of cognitive processing must be differentially advantageous, depending on the demands of a particular task.

Specifically, some tasks require ignoring contextual information when making a judgment about a focal object. For example, a judgment about another person may often be tainted by wrong stereotypes associated with a group of which that person is a member. In these circumstances, it is necessary to discount any such stereotypes. Such tasks may be called *absolute* tasks in that the focal judgment must be uninfluenced or unchanged by any contextual information. In these tasks, performance should be better for North Americans than for Asians. Using the RFT (Witkin & Berry, 1975), Ji et al. (2000) recently provided evidence supporting this prediction. Participants viewed a tilted frame with a rotating line placed at the center. The participants' task was to rotate the line so that it was orthogonal to the earth's surface (or it was aligned to the direction of gravity) while ignoring the frame. Ji et al. found that Americans were more accurate than Chinese in aligning the line (hence indicating their superior ability to ignore contextual information). This evidence is noteworthy because the RFT has no obvious social elements.

In contrast, other tasks require incorporating contextual information. For example, a judgment about another person often benefits from attention duly given to the specific social situation in which that person behaves. These tasks may be called *relative* tasks in that the focal judgment must change in accordance with the nature of the relevant context. One might expect that Asians with contextual sensitivity would have an advantage over North Americans in performing such tasks. The evidence supporting this prediction comes exclusively from social domains. Thus, it is well known that North Americans often fail to give proper weight to significant contextual information in drawing a judgment about a focal person. This bias, called the *fundamental attribution error*, is typically substantially weaker in Asian cultures (e.g., Miyamoto & Kitayama, 2002; Morris & Peng, 1994).

Address correspondence to Shinobu Kitayama, Faculty of Integrated Human Studies, Kyoto University, Yoshida, Sakyo-ku, Kyoto 606-8501, Japan; e-mail: kitayama@hi.h.kyoto-u.ac.jp.

THE PRESENT RESEARCH

The available evidence indicates that there is substantial cognitive difference across cultures (Nisbett et al., 2001). Furthermore, this difference can be demonstrated with both tasks that are obviously social (e.g., Miyamoto & Kitayama, 2002) and those that are minimally social (e.g., Ji et al., 2000). Nevertheless, there are some significant limitations that have hampered the further development of theory on cultural variation in cognitive competences.

First, with the important exception of the work by Ji et al. (2000), virtually no studies have evaluated performance against any objective criterion. This makes it difficult to draw any conclusions on the normative status of the cognitive biases that are suggested in the literature. Second, in all the existent studies examining relative tasks (e.g., attitude attribution), participants were not instructed to use contextual information, and therefore it is uncertain whether the cross-cultural differences were due to Asians' greater propensity to attend to the context, their greater competence to incorporate information in the context, or both. Third, though the RFT findings of Ji et al. suggest that North Americans' greater ability to ignore context extends from social to nonsocial tasks, it is not clear whether Asians' greater ability to incorporate context extends to nonsocial tasks. Fourth, and perhaps most important, in all the existent studies, very different domains, such as line alignment and social perception, were used in defining the two theoretical types of tasks. This makes it impossible to draw any meaningful comparison between performance in an absolute task and performance in a relative task.

In an effort to address these limitations inherent in the current evidence, we developed a new test called the framed-line test (FLT). The FLT is specifically designed to assess both the ability to incorporate and the ability to ignore contextual information within a single domain that is arguably nonsocial. Further, this assessment can be made in reference to an objective standard of performance. Specifically, on each trial, participants are presented with a square frame, within which is printed a vertical line. The participants are then shown another square frame of the same or different size and asked to draw a line that is identical to the first line in either absolute length (absolute task) or proportion to the height of the surrounding frame (relative task).

In the absolute task, the participants have to ignore both the first frame (when assessing the length of the line) and the second frame (when reproducing the line). Hence, North Americans should perform this task better than Asians. In the relative task, the participants have to incorporate the height information of the surrounding frame in both encoding and reproducing the line. Hence, Asians should perform this task better than North Americans. Moreover, one major advantage of the FLT is that it allows an assessment of the relative ease or difficulty of the two tasks. We predicted that whereas Asians would be more accurate on the relative task than the absolute task, the reverse would be the case for North Americans.

STUDY 1: THE FLT IN JAPAN AND THE UNITED STATES

Method

Participants

Twenty undergraduates at Kyoto University, in Kyoto, Japan (8 males and 12 females), and 20 undergraduates at the University of Chicago (9 males and 11 females) volunteered to participate in the study. All the Japanese undergraduates were native Japanese, and all the American undergraduates were of European descent.

Materials and procedure

Upon arrival in a lab, participants were told that they would perform simple cognitive tasks. They were given both the absolute task and the relative task in a counterbalanced order, receiving specific instructions for each task right before they performed it. In both tasks, on each trial they were shown a square frame, within which a vertical line was printed. The line was extended downward from the center of the upper edge of the square (see Fig. 1). The participants were then moved to a different table placed in the opposite corner of the lab (so as to ensure that iconic memory played no role) and shown a second square frame that was either larger than, smaller than, or the same size as the first frame. The task was to draw a line in the second frame. In the absolute task, the participants were instructed to draw a line that was the same absolute length as the line in the first frame. In the relative task, the participants were instructed to draw a line whose proportion to the size of the second frame was the same as the proportion of the first line to the size of the first frame. We took care to ensure that the participants understood the tasks by using concrete examples, such as the ones given in Figure 1.

The stimuli were prepared such that there were five different combinations of the relative sizes of the two frames and the line in the first

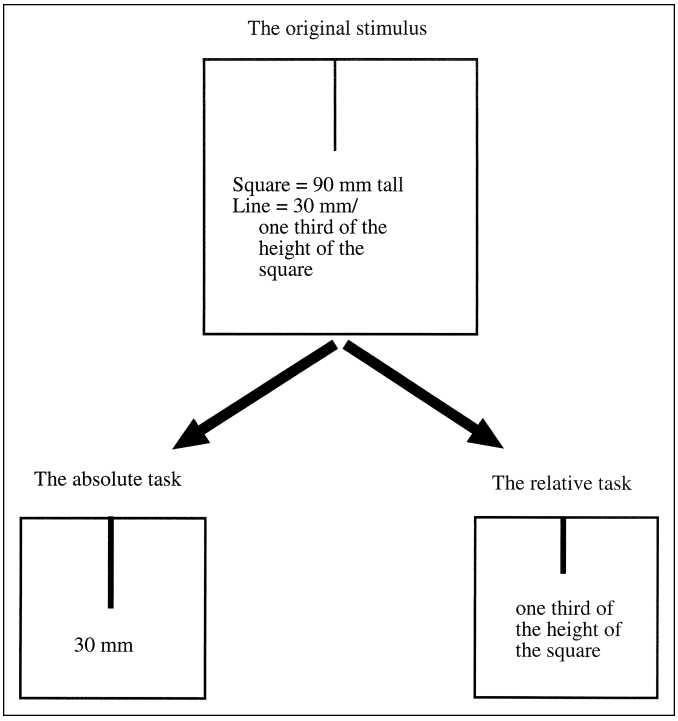

Fig. 1. Example of the framed-line test (FLT) used in these studies. Participants were shown a square frame with a vertical line, and asked to draw a line in a new square of the same or different size. The line was to be drawn so that it was identical to the first line in absolute length (absolute task) or so that the proportion between the length of the line and the height of its frame was identical to the proportion between the line and frame in the original stimulus (relative task).

Table 1. *Mean error scores (in millimeters) in the absolute and relative line-drawing tasks in Study 1*

Height of first frame	Length of line	Height of second frame	Absolute task		Relative task	
			Japanese	Americans	Japanese	Americans
89	62	179	6.8 (5.0)	2.2 (2.1)	6.3 (4.8)	10.6 (4.1)
102	29	153	3.6 (4.9)	2.5 (2.5)	5.7 (5.9)	6.2 (4.0)
127	53	127	7.1 (4.7)	3.8 (4.0)	4.0 (3.3)	4.5 (3.5)
153	87	102	9.0 (4.9)	6.1 (4.6)	4.2 (3.4)	6.6 (5.0)
179	31	89	3.6 (2.9)	3.8 (3.6)	2.3 (2.7)	3.7 (2.5)

Note. Standard deviations are in parentheses.

frame (see Table 1). In two combinations the first frame was smaller than the second, and in two other combinations the first frame was larger than the second. Furthermore, in half of these cases, the first line was longer than one half the height of the first square, and in the remaining half, the first line was shorter than half the height of the first square. Finally, in the fifth combination, the first and the second frames were identical in size. This last case is of interest because the correct response would be identical in the relative and the absolute tasks. The five combinations were presented in a random order. The same stimuli were used in the relative and absolute tasks.

Results and Discussion

An inspection of the data showed that overestimation and underestimation occurred to a nearly equal extent for each of the five stimulus combinations. Accordingly, in order to assess performance in the two tasks, we measured the lines drawn by the participants and calculated the absolute difference between these lengths and the correct lengths. Because the absolute size of error increased somewhat as the lines became longer, we also analyzed the percentage of the error relative to the correct line length. The results were no different whether we analyzed absolute error or percentage of error. We therefore discuss only the results for absolute error.

The mean error scores for the two tasks are summarized in Table 1. These means were submitted to an analysis of variance (ANOVA) with one between-subjects variable (culture of participant: Japanese vs. American) and two within-subjects variables (task: absolute vs. relative; stimulus version: the five combinations of frames and line). A preliminary analysis had shown that the effects did not depend on either gender of the participants or the order in which the two tasks were given.

As predicted, the interaction between culture and task proved significant, $F(1, 38) = 24.41$, $p < .0001$. The pertinent means are plotted in Figure 2. As predicted, Japanese performed the relative task significantly more accurately than the absolute task (Ms = 6.05 vs. 4.52), $t(38) = 2.56$, $p < .02$. In contrast, Americans performed the absolute task more accurately than the relative task (Ms = 6.35 vs. 3.71), $t(38) = 4.57$, $p < .01$. Moreover, Americans performed the absolute task significantly better than Japanese, $t(38) = 3.92$, $p < .01$, and the reverse was true for performance in the relative task, $t(38) = 3.06$, $p < .01$. The relative ease of the two tasks varied across the five stimulus combinations, as indicated by a significant main effect of version and a significant interaction between version and task, $F(4, 152) = 8.95$, $p < .001$, and $F(4, 152) = 9.44$, $p < .001$. However, the three-way interaction involving culture, task, and version was negligible ($F < 1$). Thus, the pattern in Figure 2 emerged over all the five combinations. The same pattern emerged even when the two frames were identical in size, and the correct length was identical in the two tasks. Specifically, for this stimulus combination, Japanese performed the relative task significantly better than the absolute task, $t(38) = 2.53$, $p < .02$, although the difference in performance was considerably attenuated for Americans, $t < 1$. We return to this issue later.

STUDY 2: VARIABILITY AND MALLEABILITY OF FLT PERFORMANCE

In Study 2, we sought to replicate Study 1 and to extend it by testing both Americans and Japanese in both Japan and the United States. This effort was motivated by a concern with the variability and malleability of cross-cultural variations. If, for example, the cross-cultural difference we observed is both relatively uniform within each culture and relatively stable and traitlike over time, then the cross-cultural variation should be entirely a function of the cultural origins of each participant: Americans (or Japanese) should show a prototypically American (or Japanese) pattern more or less uniformly regardless of where they are tested. If, however, the cognitive abilities at issue are both variable and malleable, there ought to be considerable variation as a function of both the cultural origins of participants and the specific location in which they are tested. Specifically, participants in a foreign culture should show a pattern of cognitive biases that resembles the pattern typical in the host culture.

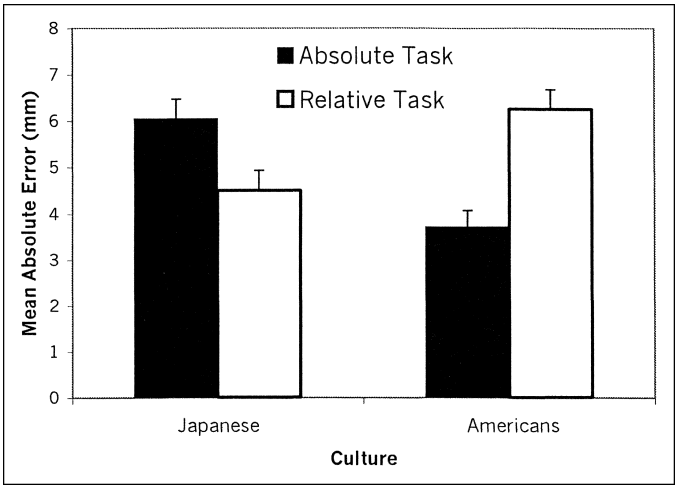

Fig. 2. Results from Study 1: Japanese and American participants' mean error (in millimeters) in the two line-drawing tasks of the framed-line test. The error bars represent standard errors.

Method

Participants

Four groups of individuals (total $N = 111$) volunteered for the study. The Japanese in Japan were 32 undergraduates (20 males and 12 females) at Kyoto University. They were tested by a Japanese experimenter, and instructions were given in Japanese. The Americans in Japan were 18 exchange students (8 males and 10 females) who were temporarily staying at the Kansai Institute for Foreign Languages. They had stayed in Japan for 4 months at most, and their Japanese proficiency was quite limited. They were tested by a Japanese experimenter, and their instructions were given in English. The Americans in the United States were 40 undergraduates (21 males and 19 females) at the University of Chicago, and the Japanese in the United States were 21 Japanese undergraduates (13 males and 8 females) who were temporarily studying at the University of Chicago. These Japanese had stayed at the university for a varying length of time, from 2 months up to 4 years. The Americans and the Japanese in the United States were both tested by an American experimenter, and instructions were given in English.

Materials and procedure

Six different combinations of the relative sizes of the two frames and the line in the first frame were prepared (see Table 2). They were similar to the combinations used in Study 1, except that some of the ratios of the size of the two frames were somewhat changed and the pattern with the two frames of the identical size was run in two variations. The participants were tested individually using the same procedure as in Study 1.

Results and Discussion

As in Study 1, there was no systematic tendency for over- or underestimation in any of the stimulus combinations. Also as in Study 1, the results were no different whether we analyzed absolute error or percentage of error, so we discuss only the results for absolute error. Preliminary analysis showed no significant effects involving the gender of participants. Although past research tended to show females to be more context sensitive than males (Cross & Madson, 1997), this effect appears to be less robust than the cultural difference. Also as in Study 1, we did not find any reliable effect of the order in which the two tasks were given.

The means were submitted to a $2 \times 2 \times 2 \times 6$ ANOVA, with two between-subjects variables (cultural origin of participant: Japanese vs. American; testing location: Japan vs. United States) and two within-subjects variables (task: absolute vs. relative; stimulus version: the six combinations of frames and line). The mean error scores are summarized in Table 2. The size of error varied systematically across the four groups of participants, as indicated by a significant main effect for testing location and a significant interaction between testing location and cultural origin, $F(1, 105) = 15.97$, $p < .0001$, and $F(1, 105) = 8.25$, $p < .01$. Further, the size of error was larger for the absolute task than for the relative task, $F(1, 105) = 39.56$, $p < .0001$. However, as in Study 1, the critical interaction between task and cultural origin proved to be highly significant, $F(1, 105) = 10.18$, $p < .002$. Moreover, we also found a highly reliable interaction between task and testing location, $F(1, 105) = 56.19$, $p < .0001$.

The pertinent means are summarized in Figure 3. As in Study 1, Japanese participants in Japan proved to be much more accurate in the relative task than in the absolute task, $t(105) = 9.90$, $p < .01$. In contrast, Americans in the United States were significantly more accurate in the absolute task than in the relative task, $t(105) = 2.15$, $p < .05$. The remaining two groups of participants showed an effect that strongly resembled the effect of the host culture. Thus, the pattern for Americans in Japan was closer to the pattern for Japanese in Japan than to the pattern for Americans in the United States. Likewise, the pattern for Japanese in the United States was closer to the pattern for Americans in the United States than to the pattern for Japanese in Japan. Examined from a different angle, performance in the relative task was significantly better for Japanese in Japan than for Americans in the United States, $t(105) = 7.84$, $p < .001$, but performance in the absolute task was better for Americans in the United States than for Japanese in Japan, $t(105) = 4.73$, $p < .001$. In both cases, the data in the remaining two groups fell in between. It is noteworthy that essentially the same pattern was observed across the six combinations of stimuli (see Table 2). In particular, as in Study 1, the same cross-cultural difference in error pattern was observed even when the two frames were equal in size.

GENERAL DISCUSSION

Sociocultural Shaping of Attention and Perception

The current work is consistent with recent theorizing on cultural variation in cognition (Nisbett et al., 2001) in showing that Japanese are more capable of incorporating contextual information in making a judgment on

Table 2. *Mean error scores (in millimeters) in the absolute and relative line-drawing tasks in Study 2*

			Absolute task				Relative task			
Height of first frame	Length of line	Height of second frame	Japanese in Japan	Americans in Japan	Japanese in the U.S.	Americans in the U.S.	Japanese in Japan	Americans in Japan	Japanese in the U.S.	Americans in the U.S.
81	68	162	9.2 (5.7)	6.6 (5.7)	4.1 (3.0)	3.4 (2.9)	4.3 (3.5)	3.6 (2.6)	5.7 (3.2)	7.7 (7.4)
108	22	162	5.1 (5.1)	3.2 (2.7)	3.2 (2.3)	4.1 (2.6)	3.1 (2.0)	5.8 (4.4)	3.0 (2.4)	3.9 (3.4)
101	28	101	8.1 (6.7)	5.4 (7.0)	4.0 (2.8)	4.2 (3.0)	3.1 (2.0)	2.7 (1.8)	2.9 (2.6)	4.4 (2.9)
141	102	141	14.5 (10.1)	14.0 (9.1)	3.3 (2.9)	6.5 (4.7)	3.9 (2.8)	5.1 (4.1)	4.7 (3.3)	8.4 (5.6)
108	73	81	8.0 (4.4)	7.8 (3.5)	4.8 (3.3)	5.3 (3.8)	3.0 (2.2)	4.2 (4.8)	2.8 (2.4)	5.6 (4.0)
162	30	81	6.7 (7.0)	4.6 (3.6)	3.9 (2.4)	4.2 (3.2)	2.0 (1.9)	2.8 (1.7)	2.7 (2.0)	3.9 (2.2)

Note. Standard deviations are in parentheses.

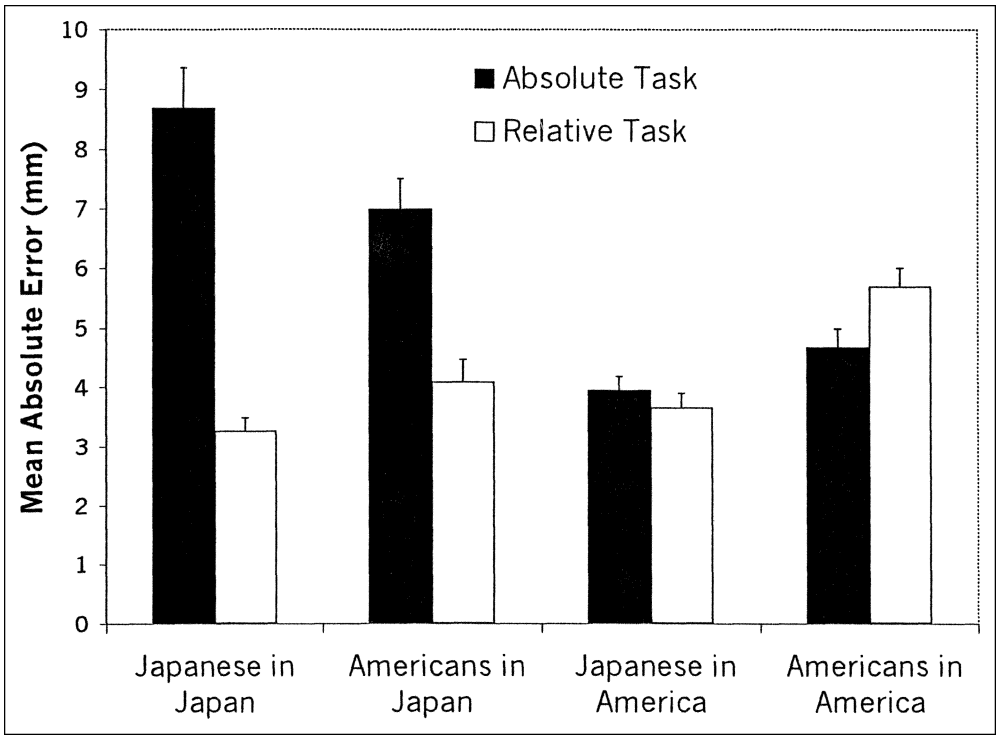

Fig. 3. Results from Study 2: Mean error scores (in millimeters) in the two line-drawing tasks of the framed-line test. Results are shown separately for Japanese and Americans in the two cultural locations, Japan and the United States. The error bars represent standard errors.

a focal object, but North Americans are more capable of ignoring contextual information. We demonstrated this cross-cultural variation in a nonsocial task that is specifically designed to simultaneously assess the two cognitive competences of ignoring or incorporating context. The FLT may be an important source of information about a nonsocial, basic cognitive capacity that is recruited in making more complex, contextualized judgments and perceptions. Future research should clarify both the social origins of the nonsocial cognitive and attentional skills and processes involved in the FLT and the contribution of these processes to judgments and inferences about social objects and events.

We repeatedly found the same cross-cultural variation in error pattern even when the two frames were identical. This finding contradicts the notion that Asians (or Americans) are predisposed to perform the relative (or the absolute) task even when instructed to do otherwise. If our participants had such predispositions, errors should have been minimal when the two frames were identical because, under these conditions, the correct answers in the two tasks converge. In view of the current evidence, we suggest that errors were due, in part, to difficulty in accurately encoding the central line. That is, whereas Japanese may have had difficulty releasing attention from the frame and then refocusing it on the line in the absolute task, Americans may have had difficulty releasing attention from the central line and shifting it to the frame in the relative task.[1] Future work should examine the role of attentional and other mechanisms in greater detail.

1. It is of note that the errors in the two tasks of the FLT were largely independent within each experimental group in both studies ($-.08 < r < .44$, median $= -.06$), indicating that the two attentional abilities are mostly separate.

Limitations

The effects of cultural origins of participants and test locations in Study 2 are quite suggestive, but should be interpreted with caution. One provocative interpretation is that the effect of test location was caused by immersion in a new culture. That is, cognitive and attentional capacities and tendencies may be modified in accordance with new demands and affordances of living in a new host culture (Kitayama, Markus, Matsumoto, & Norasakkunkit 1997). Such a modification might be permanent once it takes place or relatively temporary and reversible; these different possibilities have different implications for what might be expected to happen when people return to their home country.

However, other interpretations of our data are also possible. Because of a variety of practical constraints associated with cross-cultural experimental research, we could not exercise the degree of experimental control that we would have preferred. In particular, we depended entirely on convenience samples. We wish to acknowledge three resulting difficulties in interpretation.

First, the average length of stay in the host culture turned out to be very different between the Americans in Japan and Japanese in the United States. Although this variable did not correlate with the size of error in the two tasks, a more balanced sampling would have been desirable.

Second, the language used for instructions was also chosen for convenience. In particular, in the United States not only Americans but also Japanese were tested in English, but in Japan participants were tested in their native languages. This might have had an unknown degree of influence on the results because evidence indicates that language can prime the associated culture (Hoffman, Lau, & Johnson, 1986; but see Ishii et al., 2003, for an important caveat).

Third, and most intriguing, both the Japanese participants in the United States and the American participants in Japan were people who voluntarily moved to the other culture. Though the obtained effects on cognitive biases may have been due to immersion in a new culture, the possibility of selection bias is equally viable. That is, only those people who have psychological affinities to another culture may find themselves living in this other culture. Although these explanations for the effect of test location are not mutually exclusive, future work should empirically address their relative significance.

Conclusion

Culture is a source of generic expectations; default goals, desires, and needs; and overarching values. Cultural variations in attention, perception, and cognition, then, would enable researchers to take a renewed look at the New Look (Bruner, 1994). The current work suggests that different cultures' practices and beliefs encourage very divergent cognitive and attentional capacities involved in either incorporating or ignoring context while making a judgment about a focal object.

Future work along the lines proposed here may reveal a degree of sociocultural shaping of attention and perception that is substantially greater than has so far been assumed in the psychological literature. If so, this evidence would provide a solid basis for reconceptualizing human psychological processes and structures as fully embedded in and thus significantly constituted by the collectively shared practices, values, and beliefs of culture (Kitayama, 2002). Indeed, if properly analyzed, the thesis of the New Look will be instrumental in breaking a self-imposed shell of the traditional psychological discipline and broadening its horizon to include society, culture, and history in its territory of investigation.

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