

Placing the Face in Context: Cultural Differences in the Perception of Facial Emotion

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Two studies tested the hypothesis that in judging people's emotions from their facial expressions, Japanese, more than Westerners, incorporate information from the social context. In Study 1, participants viewed cartoons depicting a happy, sad, angry, or neutral person surrounded by other people expressing the same emotion as the central person or a different one. The surrounding people's emotions influenced Japanese but not Westerners' perceptions of the central person. These differences reflect differences in attention, as indicated by eye-tracking data (Study 2): Japanese looked at the surrounding people more than did Westerners. Previous findings on East–West differences in contextual sensitivity generalize to *social* contexts, suggesting that Westerners see emotions as individual feelings, whereas Japanese see them as inseparable from the feelings of the group.

Keywords: culture, emotion, attention

For centuries, artists and scientists in the West have been fascinated by facial expression and have written treatises documenting the correspondence of particular expressions to particular emotions. In the opening chapter of *The Expression of the Emotions in*

Man and Animals, Darwin (1872/1965) cites predecessors dating back to 1667. Darwin himself considered the face to be the preeminent medium of emotional expression in humans, capable of representing all the major emotions as well as subtle variations within each one. Following the rise of behaviorism, the significance of the face was disputed for decades, but it was never entirely ignored: Research on facial expression continued, sometimes in attempts to show that it was definitely diagnostic of emotion, sometimes in attempts to show that it was not (cf. Ekman, Friesen, & Ellsworth, 1972, for a review). The strong folk intuition that people's emotions are revealed by their faces persisted, unmoved by the scientific controversy.

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In the early 1970s, Darwin's ideas about the importance of facial expression came to be widely accepted, and research on facial expression proliferated. Sylvan Tomkins (1962, 1963) argued that facial expressions are biologically based, universal manifestations of emotions. Strong confirmation was provided by the research of Paul Ekman (1971) and Carroll Izard (1971), who showed that expressions of emotions were recognized as communicating the same feelings by people from many different cultures in Europe, North and South America, Asia, and Africa. The conclusion was that facial expressions were innate, universal, and phylogenetically derived, as Darwin had argued, and some theorists went so far as to argue that "Emotion . . . is neuromuscular activity of the face"

(Izard, 1971, p. 188). Although most researchers now believe that no single element is a sufficient condition for an emotion, the face still enjoys a special status in psychological theories of emotion (Carroll & Russell, 1996; Matsumoto, 1996).

Ekman (1972) and Izard (1994) used similar methods in their cross-cultural research. They each created a set of photographs of emotional expressions that elicited high levels of agreement among Americans and then showed them to people in other countries and asked them to choose the emotion label that best described the face. Ekman and Friesen (1971) replicated the basic findings using a simpler story-selection task and a group of New Guinea aborigines who had minimal exposure to Westerners or Western media. The methods used in these landmark studies were criticized (Fridlund, 1991; Russell, 1994), but subsequent research using a variety of more sophisticated techniques and controls has consistently supported the hypothesis that the general interpretation of certain emotional facial expressions is culturally universal (Haidt & Keltner, 1999; and see Keltner, Ekman, Gonzaga, & Beer, 2003, for a review).

Most of the researchers in this tradition were looking for evidence of cultural universals in line with the theories of Darwin (1872/1965) and Tomkins (1962, 1963). Along the way, they also found some cultural differences—some emotions and some cultures showed less agreement than others, but these differences received scant attention, in part because the researchers were looking for evidence of universality, in part because of the lack of any theoretical framework for explaining differences (Mesquita & Ellsworth, 2001; Mesquita & Leu, in press). More recent research, although not challenging the central findings of Ekman and Izard, suggests that there is also considerable cultural variation in interpretations of the meaning of facial expressions. There is a gradient in the cross-cultural recognition of facial expressions, such that the labeling of some expressions shows more cross-cultural convergence than of others (Haidt & Keltner, 1999). Furthermore, studies have found systematic cross-cultural differences in intensity ratings (Yrizarry, Matsumoto, & Wilson-Cohn, 1998) and complexity (Biehl et al., 1997). Moreover, the degree to which perceivers have been exposed to the culture of the posers improves the accuracy of recognition (e.g., Elfenbein & Ambady, 2002; Russell & Fernandez-Dols, 1997). This effect should not be exaggerated, however, because the culture of the poser trumps the ingroup advantage (Matsumoto, 2002). Furthermore, in spite of the differences, there is consistent universality with respect to the modal emotion attributed to a limited set of facial configurations (Matsumoto, 1989, 1992, 1993; Matsumoto, 2002; Matsumoto & Ekman, 1989; Matsumoto & Kudoh, 1993; Russell & Fernandez-Dols, 1997). Thus, both similarities and differences in the categorization of facial behavior have been found, but despite increasing attention to the differences, the similarities across cultures are still impressive.

Whether focused on universals or on cultural differences, in almost every study, participants have been asked about the emotion expressed by single, isolated faces. In general, there were no other expressive cues in the stimuli shown to participants, there was usually no motion, and, most important, there was no social or situational context. In everyday life, information from all of these sources is available and may influence the perceiver's understanding of the meaning of a facial expression. The significance of this information and its incorporation into attributions of emotion may

vary from culture to culture. People can only attend to a small sample of the possible events in their complex and ever-changing environments, and there is increasing evidence that people of different cultural backgrounds allocate their limited attention quite differently. A substantial body of research, for example, suggests that North Americans and East Asians are differentially sensitive to contextual factors (e.g., Kitayama, Duffy, Kawamura, & Larsen, 2003; Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, & 2001).

Attention to Context

According to Nisbett (2003), Western Europeans are characterized by “analytic” patterns of attention, dividing reality into discrete categories with defining attributes (“cutting nature at the joints”, as Plato recommended). East Asians have a more “holistic” pattern of attention, perceiving people, objects, and events in terms of their relationships to other people, objects, and events, rather than in terms of their distinctive properties. A dog is not a mammal of the canine genus, but a friend of people and an enemy of cats. People raised in the Western European tradition find it easy to isolate an object from its context; East Asians do not. For East Asians, the object is perceived in relation to other objects, in relation to its context. The fact that it is part of a larger whole is an important aspect of its essence. Nisbett and his colleagues believe that the Eastern philosophical traditions of Confucianism, Buddhism, and Taoism reflect this holistic perspective, whereas the Western traditions of Platonism, Aristotelianism, and monotheism emphasize the distinctive characteristics of entities and individuals.

Several studies have found that North Americans attend more to focal objects and less to objects-in-context than East Asians do. For example, North Americans are better at tasks that require the separation of an object from its context; in the rod and frame task, they are more field independent. In adjusting the rod to a vertical position, North Americans are less influenced than East Asians by the orientation of the frame (Ji, Peng, & Nisbett, 2000), and in judging the absolute size of the rod, they are less influenced by the size of the frame (Kitayama et al., 2003). However, East Asians are more alert than North Americans to relationships and context. They are much better at judging the degree of association between arbitrary figures that have been presented in various combinations (Ji et al., 2000), and they consistently outperform North Americans in a *relative* version of the rod and frame task, requiring the estimation of the size of the rod *in proportion to* the size of the frame (Kitayama et al., 2003).

Masuda and Nisbett (2001) showed American and Japanese observers scenes of an underwater world and asked them to describe what they had seen. Americans generally focused on the central objects (“There are two fish swimming together . . .”), whereas the Japanese included information about the context and the relationships among the objects (“There is a green pond with many little plants and animals, and two fish . . .”). When the fish were later presented without their original background context, Japanese had trouble remembering whether they had seen them before; changes in the context had a negligible effect on Americans' memory for the fish.

The Special Significance of Social Context

Another important line of research suggests that this tendency for East Asians to include the context in their perception of events should be especially conspicuous in *social* contexts. Whereas North Americans perceive people as autonomous individuals with distinctive attributes and personal goals, striving for singularity (Markus & Kitayama, 1991; Markus, Kitayama, & Heiman, 1996; Markus, Mullaney, & Kitayama, 1997), East Asians perceive people as inseparable from other people, so that “the relationship, rather than the individual, may be a fundamental unit of consciousness” (Markus et al., 1997). The North American focus on the individual is correlated with an emphasis on the role of personal agency: Action is seen as authentic if it is “freely chosen, self-motivated, and the result of one’s own goals and intentions” (Mesquita & Markus, 2004, p. 344). Agency in the West involves oneself and one’s own goals and desires; others’ wishes and expectations, though important, are not paramount.

By contrast, in East Asian cultures, particularly Japan, action is more often seen as an accommodation. To behave appropriately is to adjust to the expectations and preferences of other people one cares about rather than to advance one’s own personal goals (Iyengar & Lepper, 1999; Morling, Kitayama, & Miyamoto, 2002; Weisz, Rothbaum, & Blackburn, 1984). Assertive self-expression and self-advancement are seen as selfish and childish. In Japan, mature agency is a matter of successfully fulfilling one’s expected role, taking the perspective of others, and promoting social harmony (Kitayama & Markus, 2000; Lebra, 1992, 1994; Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000).

These differences in the relative salience of the self compared with the salience of the relationship influence not only people’s perception of themselves but also their perceptions of others, perhaps even more so. North Americans are quintessentially prone to the fundamental attribution error, to the assumption that other people’s behavior reflects their inherent dispositions, desires, and beliefs, and not the situational forces that impinge upon them (Jones & Harris, 1967; Ross, 1977; Ross & Nisbett, 1991). East Asians, realizing that people’s behavior is constrained by role requirements and the duty to maintain agreeable relations with others, are less likely to conclude that a particular behavior is informative about an individual’s preferences or personality (Choi, Nisbett, & Norenzayan, 1999; Miller, 1984; Miyamoto & Kitayama, 2002; Morris & Peng, 1994; Norenzayan & Nisbett, 2000). In explaining human behavior, Asians make more spontaneous attributions to situational influences (Miller, 1984; Miyamoto & Kitayama, 2002; Morris & Peng, 1994) and are more responsive to situational information when it is made available or salient (Masuda & Kitayama, 2004; Norenzayan, Choi, & Nisbett, 2002).

Perception of Emotions

So far, we have presented evidence for East Asian sensitivity to context as contrasted with North Americans’ focus on central objects, and for East Asian concern for social relationships and accommodation as contrasted with North Americans’ concern for personal agency and self-expression. These differences have implications for Japanese and American perceptions of other people’s emotions and suggest that the assumed diagnosticity of facial expression in Western theories of emotion may in part reflect more general cultural concerns and sensibilities.

Americans see emotions as internal personal reactions; emotions are about the self (Markus & Kitayama, 1991). Americans recognize emotional *expressions* as spontaneous manifestations of a person’s inner feelings. Emotional expression is encouraged by parents and peers. Suppression of emotional expression is often disapproved: Not only is it a sign of insincerity, but it may even be a risk to health and well-being (Richards & Gross, 2000). Moreover, the face is central to emotional expression. Most Americans believe that they can infer emotion from other people’s faces (Carroll & Russell, 1996).

If Japanese see themselves and others in terms of interpersonal relationships, then we might expect them to see emotions as reflecting these relationships, in addition to individual internal states. There is evidence that in Asian contexts, emotions may not be idiosyncratic reflections of one’s inner self, but they may be inseparable from the feelings and responses of the larger group (Markus & Kitayama, 1994; Mesquita, 2003; Mesquita & Markus, 2004). Expression of strong emotion is discouraged, and suppression of individual emotions by adapting one’s expression to the atmosphere of the group is regarded as mature and appropriate (Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000). Thus, whereas Americans should have no trouble inferring people’s inner feelings from their facial expressions, Japanese may be more likely to look for contextual cues in order to better understand the emotions of their companions. In interviewing participants during pretesting photographs of faces for another study (Leu, Mesquita, Masuda, Ellsworth, & Karasawa, 2007), we found that when we showed facial expressions of a solitary individual to Japanese participants, some of them told us that they had no way of knowing what the person was feeling without knowing anything about the context. No Americans had trouble inferring emotions from isolated facial expressions.¹

Eastern and Western art also provides evidence of the Western preoccupation with the face, as opposed to the Eastern consideration of context. In Western portraits, the figure occupies a large part of the frame and is clearly distinguished from the ground. In East Asian portraits, the figure is relatively small, embedded in the background scene. In an analysis of East Asian and Euro-American portraits from the 16th through the 20th century, Masuda and his colleagues (Masuda, Gonzalez, Kwan, & Nisbett, 2007; Nisbett & Masuda, 2003) found that the ratio of the size of the model’s face to the size of the entire visual field was significantly smaller in the East Asian paintings. These authors also gave cameras to present-day students and asked them to take pictures of a person. The results replicated the results of the analysis of paintings: The model took up more of the total space in the

¹ Because these observations were made during open-ended pretest interviews, when we were constantly revising the instructions to encourage Japanese to make their best guess even if they felt that they needed more information, we cannot give the exact proportion of Japanese who raised this issue. It was probably no greater than 20%, but it was enough to make us concerned about the possibility of missing data and to revise our instructions accordingly. We should also note that in the cartoon faces used in the present study, the intended emotion was much clearer than in the usual photographic stimuli, and both Japanese and Americans showed high rates of accuracy in judging the intended emotion when the target face was shown alone.

American photographs than in the Japanese photographs (Masuda et al., 2007).

A more direct source of evidence is research on the relative importance of the face and the situational context in people's inferences of emotion. There are not many studies of this question, but it has a long history, dating back to the 1920s (Fernberger, 1928). Two methods have been used. In one, observers are given a picture of a face and a verbal description of the context, for example, a fear face and the information that "she has just received an unexpected gift" (Goodenough & Tinker, 1931). In the other, the context is visual; typically, photographs from contemporary magazines are used, and the observers are shown either the face isolated from the context or the whole picture. Many of these studies share methodological flaws, such as a haphazard, atheoretical selection of faces and contexts and a failure to determine the ambiguity of faces and contexts taken separately (see Ekman et al., 1972, for a critical review of this work). In general, reviewers have reached the somewhat tentative conclusion that when the face and the situation suggest different emotions, observers are more influenced by the facial expression and adjust their interpretation of the situation to fit the emotion expressed by the face (Ekman et al., 1972; Wallbott, 1988).

In all but one of the studies of facial and contextual influences, the participants have been Europeans or North Americans. The exception is a study by Vinacke (1949), who showed pictures taken from magazines to Caucasians, Chinese, and Japanese living in Hawaii. Overall, the differences among the three groups were slight. There were a number of cultural differences in the relative importance of the face and the situation for particular pictures, but Vinacke could not discern any systematic trend. However, only 8 of Vinacke's 20 pictures depicted contexts that were clearly social. Many showed only a single person, and the "context" was provided by the person's behavior (e.g., scrubbing a floor, playing chess, bending over a rosary). Fourteen of his contexts suggested multiple emotions (Ekman et al., 1972, p. 122). Thus, Vinacke's (1949) conclusion that "no consistent pattern of differences exists" (p. 427) among his three cultural groups is open to question. Vinacke himself suggested that further research with a more controlled set of stimuli was necessary (p. 419).

General Overview of the Present Study

Our hypothesis was that in inferring the emotions of an individual, Japanese would be more sensitive than Westerners to the social context. In order to test this hypothesis, we created a set of cartoon pictures of an individual in the context of a group of four other people. The facial expressions of the central figure and the other people in the group were independently varied. We asked Japanese and Western (or more specifically, Anglophone) participants to judge the emotions of the central person. This facial judgment task was designed to distinguish between two different ways of understanding emotions in another person, one ignoring and one including facial expressions of the surrounding people. We hypothesized that Westerners would focus their attention on the central figure, ignoring the others, and that they would label the central figure's emotion strictly on the basis of his own facial expression. However, we predicted that the Japanese participants would attend to the whole group, and their perceptions of the central figure's emotion would be affected by the expressions of

the other group members. That is, when participants were presented with five people and asked to judge the central person's emotion, Americans would be more apt to focus on the target face. Conversely, the Japanese participants would be sensitive to the contextual cues of the background and accordingly incorporate the background figure's emotion into their evaluation. We did not expect that the modal judgment of the Japanese would be categorically different from that of the Americans but that the expressions of the other group members would influence the strength and complexity of Japanese participants' responses.

In order to further explore the hypothesis that cultural differences reflected differences in attention rather than differences in cultural norms for reporting perceived emotions, in a second part of the study, we gave participants a recognition task consisting of pictures that they had seen in the first part and pictures that they had never seen. We expected that the Japanese participants would show more recognition accuracy than Westerners for the expressions of the background figures.

Study 1

Method

Participants

Thirty-nine American students (17 women and 22 men) at the University of Michigan and 36 Japanese students (15 women and 21 men) at Kyoto University, Kyoto, Japan participated in the experiment to fulfill a course requirement. American students were all Anglophones, who had spent at least the first 18 years of their lives in the United States.

Materials

Stimuli for emotion judgment. For the sake of clarity and control, we used cartoon images as stimuli. We wanted groups of people, with one obviously central person expressing a clear emotion, and a group of people in the background also expressing a clear emotion (either the same as or different from the central person's). It would have been extremely difficult to achieve this goal with photographs of groups of real people, as any photographer who has attempted the much simpler task of getting five people to look cheerful at the same time will realize. Other studies have used schematic images (Kilbride & Yarczower, 1976; Yuki, Muddux, & Masuda, 2007), but none of their stimuli met our research criteria. Their images had extremely simplified facial expressions (e.g., one line for a smiley mouth), raising the possibility that participants would judge such elements symbolically rather than as constituent elements of facial expression. We wanted images that would look as though they could be used in a video program that would even appeal to children. The cartoons we created depicted groups of children because we told participants that the purpose of the study was to test the realism of the stimuli for future use in an educational television program. We focused on three emotions that have been documented to occur early in life (Wellman, Harris, Banerjee, & Sinclair, 1995; Widen & Russell, 2003) and that seem to be universally recognized (Ekman & Friesen, 1975), namely, happiness, sadness, and anger (see the top and bottom panels of Figure 1).

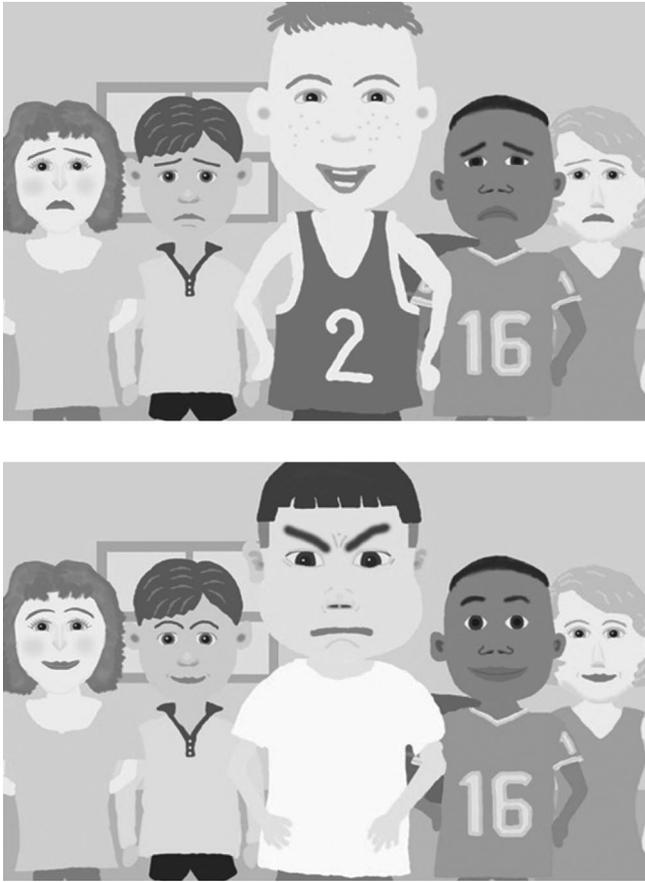


Figure 1. An example of the cartoon images used in Studies 1 and 2. A Caucasian figure (top panel) or an Asian figure (bottom panel) was used as the central figure.

The facial expressions in the cartoon images were created on the basis of the descriptions in Ekman and Friesen (1975), using Adobe Photoshop Version 6 (see Figure 1 for an example). Each picture showed five children, one central and four in the background. Because of the possibility that there might be differences in the way people interpret the faces of culturally familiar and culturally unfamiliar faces (Elfenbein & Ambady, 2002), we used two different target figures: a Caucasian boy and an Asian boy. The background figures were the same for both of them. The central figure showed one of two different levels of happiness, sadness, or anger. The background figures' emotions were always moderately intense. Both the central and the surrounding figures could also take on a neutral expression. Thus, a total of 56 different pictures were created for the emotion judgment task: (a) two different central figures (Asian and Caucasian), (b) with seven different expressions (moderate and intense anger, moderate and intense sadness, moderate and intense happiness, and neutral), (c) and peripheral figures with one of four different expressions (anger, sadness, happiness, and neutral).

A pilot study was conducted to ensure that the central person's expressions were interpreted as intended and had a similar meaning across cultures when presented without any background. Twenty-seven American undergraduate students (14 women and

13 men) at Wake Forest University and 21 Japanese undergraduate students (9 women and 12 men) at Hokkaido University judged the level of anger, sadness, and joy for all three expressions of the central faces to be used in Study 1.² As may be seen in Table 1, overall *t* tests of participants' judgments of each focal emotion indicated that the faces were unambiguous and that, with a few exceptions, there were no effects of culture on the participants' judgments of the emotions depicted.³

Stimuli for recognition accuracy. For the recognition accuracy task, 28 of the original 56 stimuli from the emotion judgment task were used. Another 28 stimuli were newly created. The new pictures were different from the original ones in one of four ways.

² We did not include the data of 2 Japanese participants because there were missing values.

³ There were two exceptions. Americans and Japanese differed in their judgment of moderate anger of the Asian target person, $t(43) = 2.63, p < .02$, and in their evaluation of Background Character 1's (a boy who stands at the left side of the target person) anger, $t(43) = 2.34, p < .02$, but even in those two cases, there was no disagreement about the emotion, only about its intensity. So, we concluded that the faces were judged as clearly reflecting the intended emotion by both Japanese and Americans.

We further conducted separate ANOVAs for each emotional expression (angry faces, sad faces, and happy faces). Thus, in total, three 2 (culture: Americans vs. the Japanese) \times 2 (emotion intensity: moderate vs. strong) ANOVAs were conducted on the intensity of each focal expression. As we expected, Japanese and Americans alike judged the emotions corresponding to the intended emotion of the central person as stronger than the other emotions in all cases. In other words, the alternative emotions (e.g., sadness and happiness for the anger faces) were significantly lower than the means for the intended emotion. Americans' and Japanese's judgment of anger for the Caucasian boy's angry face was stronger than their judgments of sadness and happiness, $F(1, 44) = 504.42, p < .001, \eta_p^2 = .920$; the judgment of sadness in the Caucasian boy's sad face was stronger than the judgments of anger and happiness, $F(1, 44) = 948.57, p < .001, \eta_p^2 = .956$; the judgment of happiness in the Caucasian boy's happy face was stronger than the judgments of anger and sadness, $F(1, 44) = 780.09, p < .001, \eta_p^2 = .947$; Japanese and American participants' judgment of anger in the Asian boy's angry face was stronger than the judgments of sadness and happiness as to the same face, $F(1, 44) = 851.85, p < .001, \eta_p^2 = .951$; the judgment of sadness as to the Asian boy's sad face was stronger than the judgments of anger and happiness, $F(1, 43) = 525.02, p < .001, \eta_p^2 = .924$; the judgment of happiness as to the Asian boy's happy face is stronger than the judgments of anger and sadness, $F(1, 44) = 688.13, p < .001, \eta_p^2 = .940$. However, no cultural differences in emotion judgments were found (Americans' and Japanese's judgment on the Caucasian boy's anger, $F < 1, ns$) the Asian boy's anger, $F(2, 44) = 3.48, .05 < p < .10$; the Caucasian boy's sadness ($F < 1, ns$); the Asian boy's sadness, $F(2, 44) = 2.58, p > .10$; the Caucasian boy's happiness ($F < 1, ns$); the Asian boy's happiness, $F(2, 44) = 3.21, .05 < p < .10$).

In addition, across cultures, intensity was judged as intended. There were main effects for intensity for all three target emotions, such that the strong expressions were judged to be more intense than the moderate expressions, $F(2, 44) = 7.53, p < .01, \eta_p^2 = .146$, for the angry face of the Caucasian boy; $F(2, 44) = 22.22, p < .001, \eta_p^2 = .336$, for the angry face of the Asian boy; $F(2, 44) = 23.13, p < .001, \eta_p^2 = .345$, for the sad face of the Caucasian boy; $F(2, 44) = 53.53, p < .001, \eta_p^2 = .549$, for the sad face of the Asian boy; $F(2, 44) = 49.85, p < .001, \eta_p^2 = .531$, for the happy face of the Caucasian boy; and, $F(2, 44) = 30.50, p < .001, \eta_p^2 = .409$, for the happy face of the Asian boy. In all, the pilot study suggested that the central person's expressions were interpreted in very similar ways across cultures.

Table 1
Mean Ratings of the Intended Emotions for the Cartoon Faces

Characters	Emotion	Intensity							
		High				Low			
		American		Japanese		American		Japanese	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
A Caucasian boy	Anger	7.85	1.43	7.89	1.70	7.15	1.56	7.26	1.19
	Sadness	7.85	1.92	8.36	0.76	6.89	1.95	6.63	1.12
	Happy	7.85	1.75	7.68	1.49	6.44	1.78	6.42	1.54
An Asian boy	Anger	8.22	1.01	8.00	1.41	7.63	1.07	6.63*	1.50
	Sadness	7.78	1.33	7.36	1.86	6.67	1.66	5.63	1.89
	Happy	7.30	1.79	7.42	1.30	6.52	1.25	5.89	1.76
Background 1	Anger					6.78	1.50	5.68*	1.63
	Sadness					6.81	1.94	6.89	1.64
	Happy					6.59	1.82	6.21	1.18
Background 2	Anger					6.70	2.05	6.36	2.59
	Sadness					7.74	1.53	6.42	2.36
	Happy					5.96	1.85	6.43	1.61
Background 3	Anger					7.19	1.66	7.00	1.80
	Sadness					7.37	2.22	7.31	1.38
	Happy					6.37	1.73	7.10	1.82
Background 4	Anger					6.37	1.71	7.11	1.44
	Sadness					7.07	1.63	6.53	1.34
	Happy					6.77	1.64	6.52	1.71

Note. Means are for the intended emotion. Background figures were always low intensity. The scale range was between 0 (*not at all*) and 9 (*extremely*).
* $p < .05$.

There were changes in (a) the facial expression of the central figure, (b) the facial expressions of the background figures, (c) the clothes of the central figure, or (d) the clothes of the background figures. That is, participants saw central and peripheral people in each picture, and sometimes the expressions of the central person were new, whereas other times the expressions of the peripheral people were new.

Procedure

Participants were told that the objective of the study was to find out whether the facial expressions in the animation were sufficiently clear to use in future educational television programs. The participants sat in front of a monitor and put their chin on a device to standardize the distance between the monitor and their face to 15 in. (38.1 cm). Participants were provided with the following instruction:

Your task is to judge the middle persons' emotion from their facial expressions. We ask you to rate the emotion on a 10-point scale. First, please rate the middle person's degree of anger. Second, please rate the middle person's degree of sadness. Third, please rate the middle person's degree of joy.

The stimuli were presented in random order using PsyScope Version 1.2.4 (Cohen, MacWhinney, Flatt, & Provost, 1993). A 17-in. (43-cm) monitor and an Apple iMac computer were used.

In the recognition accuracy phase of the experiment, participants were shown 56 pictures and asked to judge whether they had seen these pictures in the first part of the experiment; half of the 56 pictures were new, showing the central or peripheral people expressing emotions (disgust, surprise) that did not appear in the first

series, or wearing different clothes. Participants pressed either *Yes* or *No* on a keyboard to indicate whether they had seen the pictures before. Recognition accuracy was calculated as the ratio between the times that the picture was correctly judged (as either having or not having occurred) and the total number of pictures.

At the end of the experiment, participants were asked whether (a) they noticed that the emotional expression of the background figures varied and (b) the background figures' emotional expressions influenced their judgment.

Results

Preliminary Analyses

The majority of both Japanese (97%) and Americans (85%) said that they noticed changes in the expression of the background figures, and the cultural differences did not reach significance, $\chi^2(1, N = 75) = 3.52, p > .06$. This can be interpreted as a check that the manipulation was clearly observed in both cultures.

Perception of the Central Person's Emotions

Our first hypothesis was that in judging the central person's emotion (especially the intended emotion), the Japanese would be more likely than their American counterparts to be influenced by the emotions of the other people. The majority of Japanese participants (72%) reported that their judgments of the central person's emotion were influenced by the emotions of the background figures. However, the majority of American participants (72%) reported that their judgments were not influenced by the background figures, $\chi^2(1, N = 75) = 14.51, p < .001$. The first series

Table 2
Mean Judgments of Emotions in Study 1

Emotion	Judgment	Background																F	η ²
		American								Japanese									
		Angry		Sad		Happy		Neutral		Angry		Sad		Happy		Neutral			
M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD				
Anger	Anger	7.62	0.85	7.28	1.28	7.54	0.96	7.49	0.99	7.89	0.79	7.49	1.24	7.32	1.37	7.44	1.21	2.65*	.035
Sadness	Sadness	7.26	1.11	7.25	1.26	7.11	1.21	7.20	1.26	6.66	1.42	7.19	1.15	6.51	1.35	6.63	1.37	3.71**	.048
Happiness	Happiness	7.30	1.08	7.09	1.17	7.38	0.99	6.95	1.22	5.88	1.98	5.86	1.69	7.06	1.01	6.31	1.31	7.84‡	.097

* $p \leq .05$. ** $p \leq .02$. ‡ $p \leq .001$.

of analyses tested whether these self-reports were confirmed by the actual emotion ratings.

Three 2 (culture of the respondents: American vs. Japanese participants) × 2 (the target cartoons' ethnicity: an Asian boy vs. a Caucasian boy) × 2 (emotion intensity: moderate vs. strong) × 4 (background figures' emotions: anger, sadness, happiness, or neutral) analyses of variance (ANOVAs) were conducted, with the participants' ratings of the three target emotions as the dependent variables (anger ratings for the angry target, sad ratings for the sad target, and happy ratings for the happy target). These analyses were followed up Culture × Center-Background combination (center and background emotion matched vs. center and background emotion mismatched) contrast analyses.⁴ There were a few very specific gender main effects and interactions (a total of five), which could well have been due to chance and that showed no consistent pattern. Thus, the data reported are collapsed across stimulus person's gender.

The model's ethnicity. There were a few ethnic differences in ratings of the model's intensity of the emotion: The Caucasian boy's anger and happy expressions were judged as stronger than those of the Asian boy, $F(1, 73) = 44.27, p < .001, \eta_p^2 = .485$ ($M [SD] = 7.80 (.10)$ vs. $M [SD] = 7.21 [.14]$), $F(1, 73) = 21.09, p < .001, \eta_p^2 = .309$ ($M [SD] = 7.14 (.12)$ vs. $M [SD] = 6.30 [.17]$). In addition, there was a two-way Ethnicity × Intensity interaction for the target figure's happy expressions, $F(1, 73) = 14.47, p < .001, \eta_p^2 = .165$; a three-way Culture × Ethnicity × Intensity interaction for the target's anger expressions, $F(1, 73) = 5.96, p < .02, \eta_p^2 = .075$; and a three-way Culture × Target Ethnicity × Background interaction for the target's sad expression, $F(1, 73) = 2.71, p < .05, \eta_p^2 = .035$. Because these differences were unsystematic and unrelated to the main purpose of our research, the data reported are collapsed across the stimulus person's ethnicity.

The intensity. There were main effects for intensity for all three target emotions, such that the strong expressions were judged to be more intense than the moderate expressions, anger: $F(1, 73) = 71.38, p < .001, \eta_p^2 = .494$; sadness: $F(1, 73) = 37.27, p < .001, \eta_p^2 = .338$; happiness: $F(1, 73) = 53.69, p < .001, \eta_p^2 = .424$. However, no interactions between culture and intensity were found. The only main effect for culture was found for happiness, $F(1, 73) = 11.58, p < .001, \eta_p^2 = .137$, with Americans evaluating the level of happiness significantly higher than did the Japanese.

Effects of Others' Emotions on Judgments of the Central Person's Target Emotion

We began by investigating whether the background information affected the judgment of the central person's target emotion. To do so, we focused on the interaction terms for the effect of culture and background information. These results are summarized in Table 2.

Anger. The hypothesis that Japanese emotion judgments of anger would reflect the emotions of the background figures, whereas American emotion judgments would not, was borne out. A 2 (culture) × 2 (ethnicity) × 2 (intensity) × 4 (background) ANOVA indicated that there was an interaction of culture and background emotions for the judgment of anger, $F(3, 73) = 2.64, p = .05, \eta_p^2 = .035$. The results of a planned contrast test indicated that the discrepancy between Japanese participants' judgment of

⁴ Ratings of nontarget emotions were also analyzed. Participants judged the level of nontarget emotions (e.g., the central figure's level of happiness and sadness when he had an angry facial expression). We hypothesized that if participants were influenced by the background emotions, then they would have a tendency to see the central person's emotion as similar to them. Thus, for example, if participants were influenced by the sad expressions of the background figures, we predicted that this would increase their ratings of sadness for an angry central figure. Because the prediction was that Japanese would consider the expressions of the background figures more than Americans, we hypothesized that Japanese emotion judgments of the nontarget emotions would be more affected by changes in the background figures' emotions than would American emotion judgments. For each nontarget emotion, we conducted a 2 (culture) × 2 (emotion intensity) × 4 (background figures' emotions) ANOVA. Significant effects involving intensity of the target emotion were found in only two cases. Overall, the hypothesis was borne out by the results. All results were in the predicted direction that Japanese judgments of the central person's emotions would gravitate toward the emotions of the other people and that American judgments would not. In four out of the six cases, these cultural differences reached significance (see Appendix A).

We also predicted cultural differences in the extent to which emotion judgments of a neutral central face would gravitate toward the emotional expressions of other people. We conducted three 2 (culture: Americans vs. Japanese) × 4 (background figure's emotions: anger, sadness, happiness, and neutral) ANOVAs, with anger, sadness, and happiness as dependent variables. Judgments of anger, sadness, and happiness were largely in the predicted direction, but only the Culture × Anger interaction reached significance: anger, $F(3, 73) = 2.61, p = .05$; sadness, $F(3, 73) = 2.52, .05 < p < .10$ (happiness: $F < 1, ns$) (see Appendix B).

matched images (an angry target and angry backgrounds) and that of mismatched images (e.g., an angry target and happy backgrounds) were marginally larger than the discrepancy in American data, $F(1, 73) = 3.74, p = .057, \eta_p^2 = .049$.

Sadness. The results also supported the prediction that Japanese judgments of sadness would differ according to the emotions of the background figures, whereas American judgments of sadness would not. A 2 (culture) \times 2 (ethnicity) \times 2 (intensity) \times 4 (background) ANOVA indicated an interaction of culture and background emotions in the judgment of sadness, $F(3, 73) = 3.71, p < .02, \eta_p^2 = .048$. The results of a planned contrast test indicated that the discrepancy of the Japanese participants' judgment of matched images (a sad target and sad backgrounds) and mismatched images (e.g., a sad target and happy backgrounds) was significantly higher than the discrepancy in American data, $F(1, 73) = 9.85, p < .002, \eta_p^2 = .119$.

Happiness. Similarly, the results yielded support for the hypothesis that happiness judgments in the Japanese group would vary according to the emotional expressions of the background faces, whereas happiness judgments in the American group would not. A 2 (culture) \times 2 (ethnicity) \times 2 (intensity) \times 4 (background) ANOVA indicated that there was an interaction of culture and background emotions in the judgment of happiness, $F(3, 73) = 7.84, p < .001, \eta_p^2 = .097$. The results of planned contrast analyses indicated that the discrepancy of the Japanese participants' judgment of matched images (a happy target and happy backgrounds) and that of mismatched images (e.g., a happy target and angry backgrounds) was significantly larger than that in American data, $F(1, 73) = 13.12, p < .001, \eta_p^2 = .152$.

Recognition Accuracy

In the recognition task, we expected no cultural differences in the accuracy of recognition of the facial expressions of the central figure. However, we expected that Japanese participants would be more accurate in recognizing the facial expressions of the surrounding figures. These hypotheses were borne out by the results. First, both the Japanese (percentage correct = .85, $SD = .11$) and

the Americans (percentage correct = .87, $SD = .13$) performed very well when judging the original images ($t < 1, ns$). Likewise, there were no cultural differences in the recognition of changes in the central figures' facial expressions (Japanese: percentage correct = .91, $SD = .11$; Americans: percentage correct = .92, $SD = .10$; $t < 1, ns$). However, also as expected, Japanese (percentage correct = .66, $SD = .33$) were more accurate than Americans (percentage correct = .41, $SD = .36$) in spotting unfamiliar expressions in the background figures, $t(69) = 3.02, p < .005$ (see Figure 2). The findings suggest that the Japanese are better at remembering the facial expressions of other people in the group.

We explored whether the Japanese participants' sensitivity to changes in the expressions of the background figures might reflect a general attentiveness to the task by examining the accuracy of recognizing changes in the clothing of the central and background figures. Japanese and Americans were equally poor at recognizing changes in the clothing of either the central (Japanese: percentage correct = .17, $SD = .191$; Americans: percentage correct = .16, $SD = .18$) or the background figures (Japanese: percentage correct = .14, $SD = .16$; Americans: percentage correct = .17, $SD = .15$; $t_s < 1$). This suggests that the effect for recognition accuracy in this task is specific to emotions.

Discussion

Study 1 generally supports the idea that Japanese are less narrowly focused than Americans in judging other people's feelings. Japanese gauge what "everybody in the situation" is feeling and include information about other people's feelings in their judgment of the central person's emotion, whereas Americans focus narrowly on the central person's expression, ignoring information about the others. American perceptions of emotion are relatively unaffected by variations in the expressions of anyone except the person they are focused on. In contrast, Japanese rated the level of the target emotion shown in the central figure higher when the emotions expressed by the others were congruent than when they were incongruent.

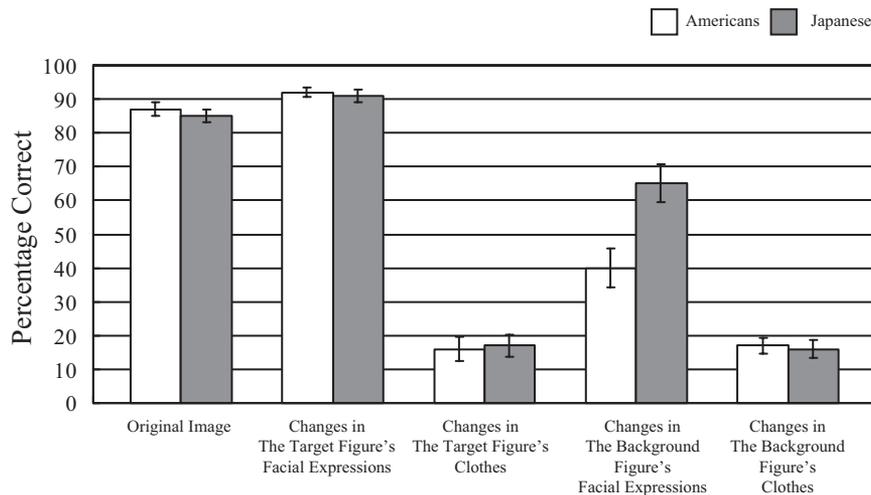


Figure 2. The results of the recognition task in Study 1.

The results of the recognition task further suggest that Japanese take note of the emotions of the background figures when making emotion judgments, whereas Americans do so to a much lesser extent. Japanese were better at detecting changes in the emotional expressions of the background people than were Americans. The recognition study also suggests that Japanese are not generally more observant but are specifically attuned to signs of emotion. There were no cultural differences in sensitivity to changes in peripheral information such as clothing.

Study 2

Study 1 demonstrates that when Americans are trying to figure out what a person is feeling, they focus on that particular person, whereas Japanese consider the emotions of the other people in the situation. There are several possible psychological processes that might account for this difference. The first hypothesis might be that both Japanese and Americans attend to all the people in the situation but that Japanese rely on this initial perception, as it resonates with their cultural understanding of human behavior, including the expression of emotion, as accommodation to the responses of other people. Americans, believing that expressions reflect the inner feelings of the individual, exclude their perceptions of the other people's emotions from their final judgment.

The second hypothesis would be that whenever Japanese see someone expressing an emotion, they look to the other people present. Their attention is not concentrated on the individual but includes everyone in the group. The emotion is not just an individual response, but is an indissoluble part of the whole social situation. Americans, who believe that emotions are authentic responses of a person's inner self, attend exclusively to the individual. Consistent with the literature on differences in the perception of nonsocial stimuli (e.g., Masuda & Nisbett, 2001), the process of emotion recognition may be "analytic" in Western contexts and "holistic" in East Asian contexts (Nisbett, 2003).

The third hypothesis that may be postulated is that both Americans and Japanese begin by focusing on the face of the individual but that the Japanese then broaden the scope of their attention to look for relevant clues in the other people present. Americans' attention remains fixed on the individual whose emotion they are asked to judge.

To this end, we replicated Study 1, but this time we measured the participants' eye movements. We hypothesized that Japanese were more likely than their Western counterparts to allocate their attention to the emotions of the other people in the group. If the Japanese are simply applying cultural knowledge after the fact, then there should be minimal differences in eye movements in the Japanese and Americans—just enough to notice the background people's faces (and almost all people of both cultures did say they noticed). If the basic unit of attention for the Japanese is the group, rather than the individual, then we would expect them to spend more time looking at the people in the background right from the beginning. If they use the group as a source of supplementary information to check the validity of an initial impression on the basis of the expressions on the central figure, then we would expect them to start out by focusing on the central figure and later include the others.

Method

Participants

Twenty-two Westerners (8 women, 14 men) and 27 Japanese students (14 women, 13 men) at Hokkaido University participated in the experiment. All the Japanese participants were born and raised in Japan. The Westerners were originally from Australia, Canada, New Zealand, The United Kingdom, or the United States and were either visitors or residents in Hokkaido. All Westerners were Anglophones, who had spent at least the first 18 years of their lives in the above countries. All participants received monetary compensation: 2,000 yen (about U.S. \$17.50) for the Western participants and 1,000 yen (about U.S. \$8.75) for the Japanese students. The additional 1,000 yen for Western participants covered their transportation to the university laboratory.

Apparatus

The stimuli were displayed at a resolution of 1024×768 pixels using a Macintosh 19-in. (48-cm) monitor. Eye movements were monitored remotely using The FreeView DTS© made by Takei Instruments Co., Ltd. Participants sat with their chin on a device that standardized the distance between the monitor and the participant's eyes to 640 mm.

Materials

Because of the limited memory capacity of the eye-tracking device, we reduced the number of stimuli from Study 1 to 42, by omitting the background figures' neutral expressions. We used a 2 (culture of the respondents: Japanese vs. Westerners) \times 2 (the target cartoons' ethnicity: an Asian boy vs. a Caucasian boy) \times 2 (intensity: moderate vs. strong) \times 3 (background: anger, sad, and happiness) factorial design. The stimuli were presented in a single random order with the constraints that the two central figures alternated, as in Study 1. Again, we used two types of target figures: an Asian figure and a Caucasian figure.

In addition to emotion ratings, we measured the ratio of participants' attentional allocation to the central figure and background figures overall, and also during the first 3 s. We analyzed the specific areas participants gazed at for each of the 3-s stimulus presentation. A single (1-s) point measures initial fixation; or even two data points (2 s) only measures the first shift in gaze, whereas with a third data point (3 s), we are able to determine the trends of their patterns of attention. There were both methodological and theoretical reasons for focusing on the first 3 s. The methodological reason is that we did not control the participants' observation time, and there was considerable variability, with some participants taking more than 15 s to evaluate a single stimulus, whereas others spent less than 4 s. There were no significant differences in the average observation time in Japanese ($M = 12340.12$ msec, $SD = 5530.52$) and Westerners ($M = 11051.17$ msec, $SD = 3817.84$), $t(47) = 0.927$, $p = .359$. In future research, it would be advisable to control the presentation time. Because we had data for 3 s for all participants, we conducted a separate analysis of eye movements during those 3 s.

Theoretically, the first 3 s are important for distinguishing among our three hypotheses: Do participants initially focus on the whole group, do they focus exclusively on the central figure, or do

Table 3
Mean Judgments of Emotions in Study 2

Emotion	Judgment	Background												F	η^2
		American						Japanese							
		Angry		Sad		Happy		Angry		Sad		Happy			
M	SD	M	SD	M	SD	M	SD	M	SD	M	SD				
Anger	Anger	6.98	1.23	6.98	1.19	6.94	1.06	7.93	0.89	7.65	1.06	7.27	1.30	2.25	.046
Sadness	Sadness	6.81	1.44	6.50	1.47	6.75	1.28	6.91	1.08	7.19	1.48	6.42	1.08	7.65 [‡]	.140
Happiness	Happiness	6.66	1.35	6.85	1.31	7.10	1.05	5.88	1.59	5.76	1.48	6.97	1.02	5.55 [†]	.106

[†] $p \leq .005$. [‡] $p \leq .001$.

they quickly broaden their focus from the central figure to include the whole group, and are there any cultural difference in these patterns?

The amount of time each participant gazed at the area of the central figure versus background figures was measured over the first (0–1,000 msec), over the second (1,001–2,000 msec), and over the third second (2,001–3,000 msec). In order to count as a gaze, the eyes needed to be fixed on one spot for 33 ms or more. If the duration was less than 33 ms, then this was considered a saccadic movement and excluded from the analyses. Because the patterns of emotion ratings were consistent across different types of emotions, we collapsed the eye movement results over the 42 images.

Procedure

The procedure was identical to that in Study 1. However, in order to calibrate the eye-tracking equipment for each individual, we first asked participants in Study 2 to look at a single dot that appeared sequentially at the top, the bottom, the right, the left, and the center of the screen for about 1 s, depending on how long it took the participants to focus on the points. During the main task, participants' eye movements were measured.

Results and Discussion

Preliminary Results

As in Study 1, both Japanese and Westerners said that they noticed changes in the expressions of the background figures, $\chi^2(1, N = 49) = 2.55, p > .10$. Also consistent with the previous results, Japanese participants were more likely to report that they were influenced by the changes in the background figures, whereas Western participants were likely to report that they were not, $\chi^2(1, N = 49) = 9.01, p < .005$.

Effects of Others' Emotions on Judgments of the Central Person's Emotion

We began by investigating whether the background information influenced the judgment of the central person's emotion. To do so, we focused on the interaction terms for the effects of culture and background information. These results are summarized in Table 3.

Consistent with Study 1, we predicted that Japanese emotion judgments of the central person would be affected by the emotions of the other people in the situation, but Western emotion judg-

ments would not. Three 2 (culture of the respondent: Americans vs. Japanese) \times 2 (ethnicity of the central person: a Caucasian boy vs. an Asian boy) \times 2 (emotion intensity: moderate vs. strong) \times 3 (background figures' emotions: anger, sadness, happiness) ANOVAs were conducted, with the participants' ratings of the three target emotions as the dependent variables (anger ratings for the angry target, sad ratings for the sad target, and happy ratings for the happy target). These analyses were followed up by Culture \times Center-Background combination (center and background emotion matched vs. center and background emotion mismatched) contrast analyses.⁵

There were a few ethnic differences in ratings of the intensity of the central figure's emotion: The Caucasian boy's anger and happy expressions were judged as stronger than those of the Asian boy, $F(1, 47) = 44.28, p < .001, \eta_p^2 = .485$ (M [SD] = 7.82 (.12) vs. M [SD] = 6.75 [.19]), $F(1, 73) = 21.09, p < .001, \eta_p^2 = .309$ (M [SD] = 6.86 (.17) vs. M [SD] = 6.21 [.19]), whereas the Caucasian boy's sad expression was judged as weaker than that of the Asian boy, $F(1, 47) = 4.41, p < .05, \eta_p^2 = .086$ (M [SD] = 6.66 [.17] vs. M [SD] = 6.87 [.17]). In addition, a Culture \times Target Figure's Ethnicity \times Background interaction for the target's anger expressions was observed, $F(1, 47) = 12.56, p < .001, \eta_p^2 = .211$. The Japanese judged that the Asian poser's strong anger expression was distinguishable from the same poser's moderate anger expression, whereas this manipulation had little effect on Westerners' judgment. In contrast, Westerners judged the Caucasian poser's

⁵ Whereas four of the nine hypotheses in Study 1 were significant and one was marginally significant, seven out of the nine hypotheses were borne out in Study 2 (see Appendixes C and D). The specific predictions that were not borne out in each study were not overlapping. Nonsignificant results in either study are thus not systematic. Thus, whereas we found in Study 2 significant Culture \times Background Emotions interactions for sadness ratings in the angry faces, $F(2, 47) = 3.24, p < .05$, this interaction did not reach significance in Study 1. In Study 2, we found significant Culture \times Background Emotion interactions for angry, $F(2, 47) = 4.53, p < .02$, and happy ratings, $F(2, 47) = 3.52, p < .05$, of the neutral face, but in Study 1, we found those interactions to be marginally significant and nonsignificant, respectively. In Study 1, we found significant Culture \times Background Emotions for sadness of the neutral face, $F(2, 47) = 2.52$, that approached significance, but this interaction did not reach significance in Study 2. The results of Studies 1 and 2 combined provide support for the assumption that nonsignificant findings in both studies were due to error variance rather than to meaningful and systematic effects.

strong anger expression as distinguishable from the same poser's moderate anger expression, whereas such manipulation had little effect on the Japanese's judgment. Because these differences were unsystematic, and unrelated to the main purpose of our research, we do not discuss them further.

Effects of Others' Emotions on Judgments of the Central Person's Emotion

Anger. The hypothesis that Japanese emotion judgments of anger would reflect the emotions of the background figures, whereas American emotion judgments would not was borne out. A 2 (culture) \times 2 (ethnicity) \times 2 (intensity) \times 3 (background) ANOVA indicated that there was an interaction of culture and background emotions for the judgment of anger, $F(2, 47) = 2.25$, $.10 < p < .15$, $\eta_p^2 = .046$. The results of planned contrast analyses indicated that the discrepancy of the Japanese participants' judgment of matched images (a happy target and happy backgrounds) and that of mismatched images (e.g., a happy target and angry backgrounds) was significantly larger than that of Americans, $F(1, 47) = 2.76$; $.10 < p < .15$, $\eta_p^2 = .055$.

Sadness. The results also supported the prediction that Japanese judgments of sadness would differ according to the emotions of the background figures, whereas American judgments of sadness would not. A 2 (culture) \times 2 (ethnicity) \times 2 (intensity) \times 4 (background) ANOVA indicated an interaction of culture and background emotions in the judgment of sadness, $F(2, 47) = 7.65$, $p < .001$, $\eta_p^2 = .140$. The results of planned contrast analyses indicated that the discrepancy of the Japanese participants' judgment of matched images (a happy target and happy backgrounds) and that of mismatched images (e.g., a happy target and angry backgrounds) was significantly larger than that of Americans, $F(1, 47) = 11.08$, $p < .002$, $\eta_p^2 = .191$.

Happiness. Similarly, the results yielded support for the hypothesis that happiness judgments in the Japanese group would vary according to the emotional expressions of the background faces, whereas happiness judgments in the American group would not. A 2 (culture) \times 2 (ethnicity) \times 2 (intensity) \times 4 (background) ANOVA indicated that there was an interaction of culture and background emotions in the judgment of happiness, $F(3, 47) = 5.55$, $p < .005$, $\eta_p^2 = .106$. The results of planned contrast analyses, however, indicated that the discrepancy of the Japanese participants' judgment of matched images (a happy target and happy backgrounds) and that of mismatched images (e.g., a happy target and angry backgrounds) was significantly larger than that of Americans, $F(1, 47) = 8.29$, $p < .01$, $\eta_p^2 = .150$.

Patterns of Eye Movement

Each participant's average amount of time spent gazing at the central figure and the background figures was measured. The threshold for recording a gaze was 33 ms. If the eye focus stayed in one spot for 33 ms, then it was counted as gaze and used for the analyses. Durations less than 33 ms were considered to be saccadic movements and removed from the analyses. The ratio of gazes allocated to the central figure to total gazes was computed. A 2 (culture: Westerners vs. Japanese) \times 2 (intensity: moderate vs. strong) \times 3 (background: anger, sad, and joy) ANOVA was conducted, with the amount of gaze allocated to central figures for

three different emotions (the target's angry face, sad face, happy face, and neutral face) as the dependent variable. The results yielded only a main effect of culture. The Japanese were less likely than their Western counterparts to allocate their gaze to the central figure, $F(1, 47) = 13.48$, $p < .001$, for angry targets; $F(1, 47) = 16.87$, $p < .001$, for sad targets; $F(1, 47) = 14.38$, $p < .001$, for happy targets. Similarly, a 2 (culture: Westerners vs. Japanese) \times 3 (background facial expressions: angry, sad, and joy) was conducted, with the amount of gaze allocated to central figures for the neutral expression as the dependent variable. The results again indicated that there was only a main effect of culture, $F(1, 47) = 9.72$, $p < .001$. Overall, the results showed clear evidence of the Japanese's context sensitivity during the emotion judgment task. Overall, Japanese spent less time looking at the central figure than did Americans, and this was true for every emotion tested (see Figure 3). The attention patterns match the emotion judgments.

Further comparisons of cultural groups indicated that, whereas both the Japanese and Westerners similarly attended to the central figure during the first second, $t(47) = 1.41$, *ns*, the Japanese started their attentive allocation to the background figures at the next second (2 s), $t(47) = 4.27$, $p < .01$; 3 s, $t(47) = 3.36$, $p < .01$ (see Figure 4). Overall, these results suggest that, at first, both the Japanese and Westerners attend almost exclusively to the central figure, but after 1 s, Japanese start to show their context sensitivity. These findings are most consistent with the third hypothesis: that both Westerners and Japanese focused on the central person initially, but then the Japanese broadened their search for information more than Westerners did.

The results are inconsistent with the notion that Westerners and Japanese attend equally to the central person and the other people and that their emotion judgments differ as a result of different evaluations of the relevance of the perceived information (Hypothesis 1). The results are also inconsistent with the idea that Japanese focus their attention differently from the very beginning (Hypothesis 2), although this might be an effect of the instruction to evaluate the emotion of the central person. At any rate, very quickly in the process, Japanese do consider information about the other people in the situation.

General Discussion

Findings of the Present Study

Consistent with previous findings (e.g., Masuda & Nisbett, 2001, 2006; Nisbett & Masuda, 2003), present studies suggest that Japanese are more likely than their Western counterparts to be attentive to contextual information. Unlike Westerners, the Japanese participants in these studies actively incorporated the feelings of the background figures when they were asked to evaluate the central person's facial expressions.

There are, however, some remaining issues worth noting here. First, we found that the effect of the group on Japanese judgment's of angry persons was relatively weaker than for sad and happy persons. Where might these differences come from? One possibility is that it is simply the matter of error, and the contextual effect observed in Japanese data is generally consistent across all the emotions we studied. An alternative possibility is that showing an angry face in public is strongly discouraged in interdependent societies such as Japan, which put importance on group harmony.

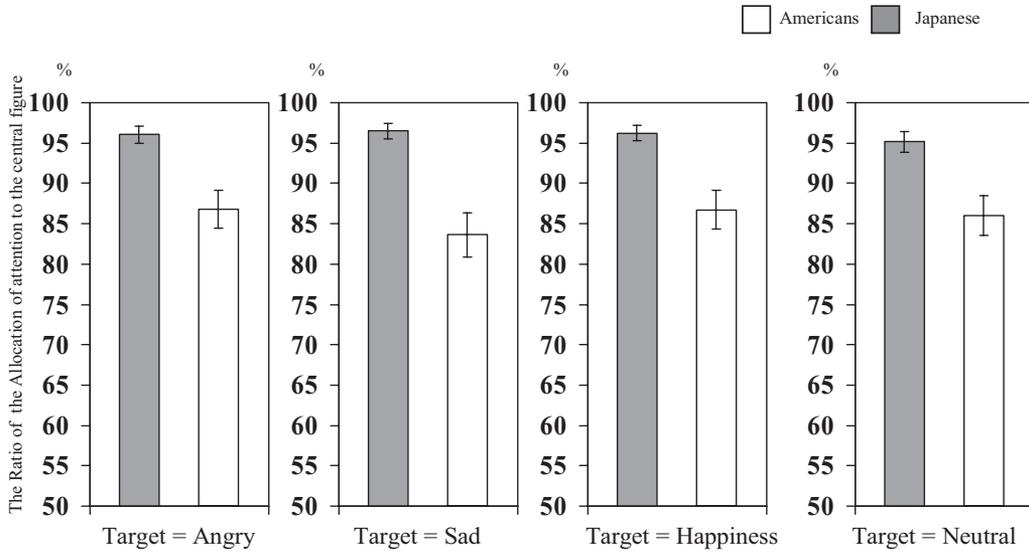


Figure 3. The results of the overall eye-tracking data in Study 2. Analyses of each emotion category were conducted independently.

For this reason, the Japanese might think “anger is anger” no matter what context the target person is in, that a Japanese would never express anger unless it were real.

Second, the findings of both Studies 1 and 2 suggest that in general, the Japanese participants saw the target’s happy face as happier when the background figures’ expressions looked happy than when they expressed other emotions. In other words, the background figures’ facial expressions acted as a prime for the judgment of the target figure, and in general, the results showed assimilation effects (Bargh & Ferguson, 2001; Higgins, 1989) instead of contrast effects.

Why might our tasks have facilitated assimilation effects? Recent theories of social cognition provide some ideas that might

address this issue (Manis & Paskewitz, 1984; Philippot, Schwarz, Carrera, De Vries, & Van Yperen, 1991; Schwarz & Bless, 1992). For example, in his interpretation comparison model (ICM) of accessibility effects, Stapel (2006) maintains that whether people show assimilation effects or contrast effects is a function of their mindset during the process: an interpretation mindset versus a comparison mindset.

According to Stapel (2006), the interpretation mindset facilitates assimilation effects. In this mode of information processing, the target object and the priming object are categorized as in the same domain, and so the priming object is easily incorporated into the judgment of the target object. In contrast, the comparison mindset facilitates contrast effects. In this mode of information processing,

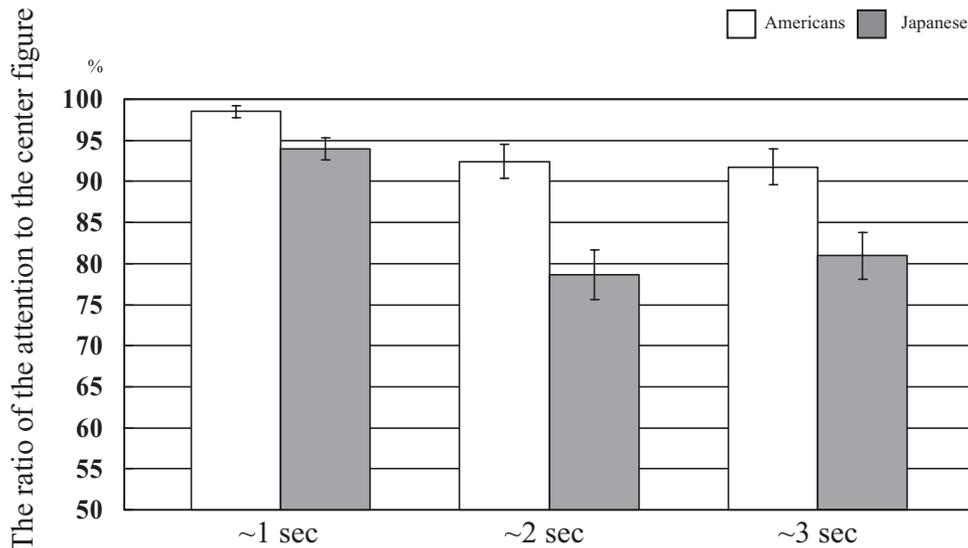


Figure 4. The results of the eye-tracking data in Study 2 for the first 3 s.

the target object is treated as a different category from that of the priming object, and so the perception of the target object is contrasted with the priming object. Research suggests that several factors play a role in activating these two types of mindset: (a) If the priming stimuli are distinctive examples (such as extreme exemplars), then contrast effects are more likely (the comparison mindset); (b) if the target object is ambiguous, then assimilation effects are more likely (the interpretation mindset).

On the basis of Stapel's (2006) ICM, we may conclude that the present tasks activated an interpretation mindset rather than a comparison mindset. Although the target figures' expressions were not ambiguous, the moderate expressions of the background figures may have induced the Japanese participants to interpret the background figures as the same category as the target figure and facilitated assimilation effects, whereas Western participants were insensitive to contextual information and showed neither assimilation nor contrast effects. Whether the salience of the background figures facilitates two different types of mindset, and whether even Westerners might show such an effect of accessibility with more salient background figures, is an interesting question for future research.

Implications of the Present Studies

Most research on people's ability to judge emotion from facial expressions has used pictures of single faces with no contextual cues and has shown high levels of cultural agreement in the interpretation of emotional expression. Even in these studies, however, the Japanese often show lower levels of agreement with the "correct" (intended) emotion than members of many other cultures (Ekman, 1972; Izard, 1971). Although the lower recognition rates of Japanese for Caucasian faces may be explained by an outgroup disadvantage (Elfenbein & Ambady, 2002), previous research does not provide an easy explanation for the fact that differences in agreement also occur when the faces presented are Japanese (Matsumoto, 2002). We suggest that one of the reasons for the lower recognition accuracy in Japanese may be that the process of labeling a face out of context is a less natural task for Japanese.

Our research examined the influence of the social context on the perception of an individual's emotion. Our hypothesis was that the *stimulus as perceived* would be different for Americans and Japanese, that when Americans infer a person's emotion, they focus on the person, whereas Japanese attend to the whole social context. The lower rates of agreement between Japanese and Americans in previous work may partly reflect the fact that for Japanese, an expression isolated from any context provides incomplete information for inferring an emotion.

Our results provide strong support for this hypothesis. When asked what a particular person is feeling, Americans inferred the emotion that corresponded to that person's facial expression, regardless of whether the people around him were happy, sad, angry, or neutral. Americans see emotional expressions as spontaneous manifestations of an individual's personal feelings, and there is no need to look beyond the individual in inferring emotion. Our Japanese participants, however, attended to the whole group in deciding what a particular person was feeling: If the other people's expression matched the person's, then the Japanese inferred that the person felt that emotion more strongly. If the other people expressed a different emotion, then Japanese perceived traces of that emotion in the individual. An individual is defined in terms of

relationships, and individual feelings cannot be separated from the feeling of the social group.

Our data suggest cultural differences in the initial perception of the stimulus, not just in reporting rules. After they had made their emotion judgments, we gave the participants a test of their recognition of the stimuli they had seen. Japanese and Americans were equally good at recognizing when the central person's face showed an emotion that had not been shown before, but Japanese were much better than the Americans in recognizing changes in the expressions of the people in the background, strongly suggesting that they paid more attention to the background people in the first place. The expressions of the background people did not change the interpretation of the basic emotion categories, as our facial expressions were unambiguous, but they did influence the Japanese's interpretation of the intensity and complexity of the emotion.

The eye-tracking study provides further confirmation. During the first 3 s of exposure, Japanese spent more time looking at the people in the background than Americans did, for all combinations of emotions.

The eye-tracking study was also designed to provide preliminary data on the nature of the process, designed to discriminate among three possibilities. The first hypothesis is that Americans and Japanese do not differ in what they notice or attend to but that the emotions they report are affected after the fact by reporting rules or culturally influenced decisions about which information is relevant. The results of both the recognition study and the eye-tracking study disconfirm this hypothesis and support the conclusion that the relevant stimulus is different in the two cultures, that is, Americans do not attend to the social context, but the Japanese do.

The second possibility is that the Japanese perceive the situation holistically, focusing on both the central figure and the group, from the instant the stimulus is presented, whereas the Americans focus more exclusively on the individual. The third possibility is that people in both cultures initially focus on the individual, but then the Japanese shift their attention to the background people, and the Americans do not.

The data are most consistent with the third hypothesis, but the shift away from the central figure occurs very quickly for the Japanese. Japanese and Americans both look at the central figure at the beginning, but it only takes a second for the Japanese to begin scanning the faces of the other people in the group. It is perhaps not surprising that both Japanese and Americans first focus on the central face. First, it is the largest thing in the picture, and second, it is in the center of the frame. Also, we asked participants to "judge the middle person's emotion" and thus directed their attention to him. It is possible that if the task demands were less specific, if we had asked a question like "What is happening in this picture?" then the results would have been different (cf. Spignesi & Shor, 1981).

Nonetheless, because it only took the Japanese 1 s, on average, to begin to include the background figures in their focus of attention, we feel that the results are generally consistent with the idea of a fundamental difference in perceptual style, consistent both with Nisbett's (2003) idea of a more holistic process in Asians and with our own hypothesis about the individualistic versus relational nature of emotion perception in America and Japan.

In some of the stimuli we used in the recognition task, we changed the clothing that the characters were wearing. We did this to test the alternative explanation that the Japanese were simply taking the task more seriously, paying closer attention than the Americans to every-

thing in the stimulus pictures, not just the faces of the people in the background. The results allowed us to rule out the hypothesis that the differences between the Japanese and the Americans were due to differences in general vigilance: Neither group correctly recognized the changes in clothing, and there was no difference between the two groups on this task. The only difference between the Japanese and the Americans on the recognition task was that the Japanese recognized changes in the emotions of the other people in the group two thirds of the time, whereas the Americans recognized them less than half of the time. It appears that in judging a person's emotion, the Japanese are more sensitive to the social context than the Americans, but not to other contextual details.

Yet, the work of Nisbett, Kitayama, and their colleagues (Kitayama et al., 2003; Masuda & Nisbett, 2001; Nisbett, 2003; Nisbett & Masuda, 2003) demonstrates that the Japanese are differentially sensitive to contextual factors in a wide range of nonsocial situations, situations involving fish in a pond, inanimate objects in a landscape, and the rod and frame task. Why did we find differences for the social/emotional factors but not for the nonsocial contextual ones? We see no fundamental contradiction between the proposition that attention to contextual factors is a general feature of East Asian perception and the proposition that attention to the social environment is more important than attention to the physical environment. Even the Japanese have limited channel capacity and cannot attend to all the details of their environment. In our experiments, the faces of the surrounding people attracted more attention than people's clothes. This may have happened because we were asking the participants to make judgments about emotions (rather than, e.g., fashion), and it may reflect a more general human tendency to attend to people's faces (Russell, 1994), or may correspond to a Japanese concern for social harmony and appropriate emotional behavior, or it may well be a combination of all three. We hope to explore these possibilities in future research.

What is important about this study is not just that the Japanese are more likely to notice the expressions of the people in the background, but that these expressions provide information about the feelings of the central person. The same smiling individual is seen as having different feelings depending on the expressions of his companions. His emotions are more intense when they are shared by others, and they are tempered by other feelings when they are not shared. Americans infer a person's emotions by focusing exclusively on that person. Expressions of emotion are indicators of an individual's inner feelings; they are intensely personal. The emotions of other people in the group are not particularly informative about an individual's feelings. They may be informative about why the person feels a particular emotion, but not about what the feeling is.

Undoubtedly, these hypotheses will be qualified in future research. The facial expressions we used—for both the foreground and background people—were unambiguous. The “situational context” consisted entirely of other people's emotions. One avenue for future research is to test the boundary conditions of our findings with richer, less schematic stimuli.

Finally, we should note that we have focused on only one possible cultural difference in emotions—the inference of other people's feelings from their facial expressions. This has of course been a major focus of cross-cultural research on emotions since the time of Darwin, and our research makes a significant contribution to this tradition, suggesting that the use of isolated, context-free faces may be a procedure that is more “natural” and appropriate in some cultures (such as America) than in others (such as Japan).

Our research identifies an important source of cultural differences in the interpretation of facial expressions, namely, social context, that could not be found using the standard method.

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Appendix A

Mean Judgments of Nontarget Emotions in Study 1

		Background																F	η ²
		American								Japanese									
Emotion	Judgment	Angry		Sad		Happy		Neutral		Angry		Sad		Happy		Neutral			
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Anger	Sadness	2.94	2.02	3.44	2.15	3.07	2.19	3.02	2.11	3.03	2.48	3.97	2.49	2.92	2.53	3.15	2.39	1.67	.022
	Happiness	0.07	0.33	0.08	0.32	0.15	0.07	0.15	0.47	0.27	0.59	0.21	0.54	0.69	0.25	0.30	0.51	4.30 [†]	.056
Sadness	Anger	1.28	1.37	1.25	1.37	1.08	1.27	1.20	1.38	2.46	1.71	1.70	1.79	1.80	1.75	1.90	1.67	3.57**	.047
	Happiness	0.08	0.29	0.08	0.36	0.19	0.52	0.15	0.40	0.32	0.73	0.26	0.48	0.76	1.51	0.35	0.86	3.47*	.045
Happiness	Anger	0.44	0.89	0.49	0.83	0.26	0.67	0.33	0.72	1.75	1.77	1.31	1.63	0.83	1.27	0.97	1.17	3.48**	.045
	Sadness	0.57	1.12	0.85	1.10	0.44	0.77	0.54	0.75	0.98	1.32	1.42	1.60	0.59	0.92	0.83	1.01	1.32	.018

* p ≤ .05. ** p ≤ .02. † p ≤ .005.

Appendix B

Mean Judgments of Neutral Emotions in Study 1

		Background																F	η ²
		American								Japanese									
Emotion	Judgment	Angry		Sad		Happy		Neutral		Angry		Sad		Happy		Neutral			
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Neutral	Anger	2.37	1.18	1.99	2.05	1.90	1.86	2.09	1.92	2.90	1.20	2.39	2.09	1.90	2.02	1.75	1.95	2.62*	.035
Neutral	Sadness	1.91	1.62	2.15	1.66	1.76	1.78	2.03	1.71	1.56	1.91	2.53	2.31	1.69	1.94	1.57	1.91	2.52	.033
Neutral	Happiness	1.00	1.34	1.12	1.42	1.50	1.54	1.08	1.39	0.92	1.70	1.17	1.97	1.90	1.71	1.12	1.67	2.65	.035

* p ≤ .05.

Appendix C

Mean Judgments of Nontarget Emotions in Study 2

		Background												<i>F</i>	η^2
		American						Japanese							
Emotion	Judgment	Angry		Sad		Happy		Angry		Sad		Happy			
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Anger	Sadness	2.97	1.93	2.95	2.14	2.76	1.78	3.65	0.89	4.58	1.06	3.56	2.40	3.24*	.065
	Joy	0.10	0.29	0.16	0.32	0.14	0.31	0.29	0.50	0.25	0.44	0.74	1.12	4.26**	.083
Sadness	Anger	1.34	1.26	1.20	1.29	1.33	1.37	2.84	1.87	2.07	1.36	2.12	1.46	2.23	.045
	Joy	0.15	0.36	0.13	0.31	0.20	0.48	0.27	0.56	0.31	0.50	0.92	1.19	5.67†	.108
Joy	Anger	0.27	0.46	0.40	0.63	0.32	0.72	1.77	1.66	1.10	1.18	0.58	0.83	8.12‡	.147
	Sadness	0.40	0.55	0.28	0.52	0.34	0.57	1.23	1.14	1.51	1.41	0.63	0.76	6.21†	.117

* $p \leq .05$. ** $p \leq .02$. † $p \leq .005$. ‡ $p \leq .001$.

Appendix D

Mean Judgments of Neutral Emotions in Study 2

		Background												<i>F</i>	η^2
		American						Japanese							
Emotion	Judgment	Angry		Sad		Happy		Angry		Sad		Happy			
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Neutral	Anger	1.43	1.37	1.73	1.36	1.63	1.44	3.13	2.26	2.81	1.95	2.02	1.92	4.53**	.088
Neutral	Sadness	1.65	1.62	2.11	2.05	1.65	1.38	1.94	1.80	2.91	2.22	1.46	1.51	2.25	.046
Neutral	Happiness	1.14	1.36	1.02	1.32	1.34	1.90	0.85	1.41	0.80	1.06	2.09	1.79	3.52*	.070

* $p \leq .05$. ** $p \leq .02$.

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