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Are the windows to the soul the same in the East and West? Cultural differences in using the eyes and mouth as cues to recognize emotions in Japan and the United States

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Abstract

The current research investigated the hypothesis that, depending on an individual's cultural background, facial cues in different parts of the face are weighted differently when interpreting emotions. Given that the eyes are more difficult to control than the mouth when people express emotions, we predicted that individuals in cultures where emotional subduction is the norm (such as Japan) would focus more strongly on the eyes than the mouth when interpreting others' emotions. By contrast, we predicted that people in cultures where overt emotional expression is the norm (such as the US) would tend to interpret emotions based on the position of the mouth, because it is the most expressive part of the face. This hypothesis was confirmed in two studies, one using illustrated faces, and one using edited facial expressions from real people, in which emotional expressions in the eyes and mouth were independently manipulated. Implications for our understanding of cross-cultural psychology, as well of the psychology of emotional interpretation, are discussed.

Keywords: Culture; Emotions; Facial expressions; Emotion recognition; Cognition

Facial expressions are our primary means of communicating emotions. As such, recognizing facial cues is an important component of social interaction, critical to interpreting the emotional states of others. Indeed, an abundance of empirical evidence over the last several decades suggests that facial expressions of basic emotions can be universally recognized, suggesting the importance of emotional expressions for human communication (for reviews, see Ekman, 1989, 1992; Matsumoto, 2001). However, consistent with the current zeitgeist in which psychologists continue to uncover cultural boundaries in even the most robust psychological phenomena, more recent research has also found evidence that there are clear but subtle variations regarding how people from different cultures interpret emotions differently (Elfenbein & Ambady, 2002, 2003; Elfenbein, Mandal, Ambady, Harizuka, & Kumar, 2004; Marsh, Elfenbein, & Ambady, 2003; Matsumoto, 1989; Matsumoto & Ekman, 1989).

One particular finding of interest is the idea that individuals have an ingroup advantage in emotion recognition. In other words, people are more accurate at judging emotional expressions by members of a cultural ingroup rather than members of a cultural outgroup (Elfenbein & Ambady, 2002, 2003). Interestingly enough, this effect has been found to be rather dynamic; the more familiar individuals are with a particular culture, the more accurate they are in judging emotions of individuals from that culture, suggesting that the ingroup advantage can change depending on the level of one's knowledge of, or exposure to, a given culture (Elfenbein & Ambady, 2002, 2003; Elfenbein et al., 2004; Marsh et al., 2003; Shimoda, Argyle, & Ricci Bitti, 1978). Researchers have suggested that this ingroup advantage exists because there are facial 'dialects' or 'accents'

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(Elfenbein & Ambady, 2002, 2003; Marsh et al., 2003) in nonverbal communication, which are practiced and understood in a shared manner within a particular culture, and that people routinely rely on this culturally specific information when interpreting other's emotions. However, research has yet to identify specifically what these 'accents' may be (Marsh et al., 2003). In the current research, we sought to extend these findings by proposing one specific factor that may contribute to emotion recognition differences across cultures. Specifically, we propose that depending on individuals' cultural background, facial cues in different parts of the face are weighted differently when interpreting emotions.

Emotions and facial cues

Although emotion *recognition* and emotion *expression* are two distinct and separate psychological phenomena, our hypothesis concerning cultural differences in emotion recognition is based on cultural differences in how emotions are expressed in different cultures. Researchers have noted that cultures of individualism or independence emphasize the direct and explicit expression of emotions (e.g., Markus & Kitayama, 1991). In fact, in Western cultures, where people tend to have an independent self-construal, denying the expression and experience of feelings is often equated with denying one's true self (Heine, Lehman, Markus, & Kitayama, 1999; Markus & Kitayama, 1991). By contrast, in East Asian countries such as Japan, China, and Korea, where people are more collectivistic and interdependent, it is more important for emotional expressions to be controlled and subdued, and a relative absence of affect is considered crucial for maintaining harmonious relationships, such that individuals do not impose their feelings on others (Heine et al., 1999; Markus & Kitayama, 1991).

Evidence from the facial expression literature supports this notion. For example, in Friesen's (1972) classic study, Japanese and American participants were asked to view highly stressful films while their facial expressions were recorded. Results indicated that Japanese participants tended to mask the expression of negative emotions such as disgust, fear, sadness, and anger when the experimenter was observing them, although they freely displayed those emotions when they were alone. Moreover, recent evidence has shown that Japanese control (e.g., neutralize, mask, etc.) not only the display of negative feelings, but also feelings of happiness more than do Americans (Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998). It stands to reason, then, if Japanese are especially concerned with controlling the expression of their emotions, then, in turn, their *interpretation* of the emotions of others may be most effective if they focus on parts of the face that are relatively difficult to control intentionally, since this type of area may be most diagnostic of one's true emotions.

Indeed, research on the physiology of facial expressions suggests that emotional expression can be controlled, but with varying success across the particular muscle groups involved. For example, smiling and frowning both involve the combined contraction of two groups of muscles: the zygomatic major (around the mouth) and the orbicularis oculi (around the eyes) (e.g., Duchenne, 1862–1990; Ekman, 1992). Research has shown that the orbicularis oculi muscles around the eyes are more difficult to control than the zygomatic major muscles around the mouth area (Duchenne, 1862–1990; Ekman & Friesen, 1975; Ekman, 1992; Ekman, Friesen, & O'Sullivan, 1988). In fact, a true smile, or "Duchenne smile," involves the contraction of the orbicularis oculi muscles around the eyes, while other types of "fake smiles" (smiles that do not indicate genuine happiness) involve only the zygomatic major muscles but not the orbicularis oculi (e.g., Ekman et al., 1988; Ekman, 1992). Thus, in terms of diagnosticity of true emotions, the eyes may be a more accurate cue than the mouth. However, the mouth is also an important cue because it is the most expressive part of the face, perhaps because it evolved as the primary means of verbal communication for human beings (Ekman & Friesen, 1975; Fridlund, 1994; de Bonis, 2004).

Thus, we propose that cultural norms for the expression of emotions will impact the predominant facial cues individuals use to recognize emotions, with the eyes being a more diagnostic cue for Japanese, and the mouth being a more diagnostic cue for Americans. We investigated this hypothesis across two studies. In Study 1, we investigated how American and Japanese participants interpreted the happiness/sadness of illustrated faces that varied in the type of cues present in the eyes and mouth. Study 2 used computer editing techniques to create faces that had various combinations of eyes and mouths taken from happy and sad faces of real individuals. Across both studies, we predicted that compared to judgments made by Japanese, Americans' judgments would be affected more strongly by the cues contained within the mouth, whereas Japanese judgments would be more strongly affected by cues in the eyes.

Study 1

Our initial empirical investigation concerned the construals of emotions as displayed in computer emoticons. Emoticons are combinations of certain keystrokes that combine to form an approximate facial expression, which can be used to convey the emotional state of the writer. For example, in the United States the emoticons :) and :-) denote a happy face, whereas the emoticons :(or :-(denote a sad face. However, Japanese tend to use the symbol (^_^) to indicate a happy face, and (; _ ;) to indicate a sad (or crying) face (Pollack, 1996). Consistent with our hypothesis, the Japanese emoticons for happiness and sadness vary in terms of how the eyes are depicted, while American emoticons vary the direction of the mouth.

Thus, in Study 1, we showed American and Japanese participants computer-generated (i.e., ☺ or ☹) emoticons with several different combinations of happy and sad eyes and mouths (see Fig. 1). Again, we predicted that compared to judgments by Japanese, American judgments would be affected more strongly by the cues in the mouth, whereas Japanese judgments would be more affected by cues in the eyes.

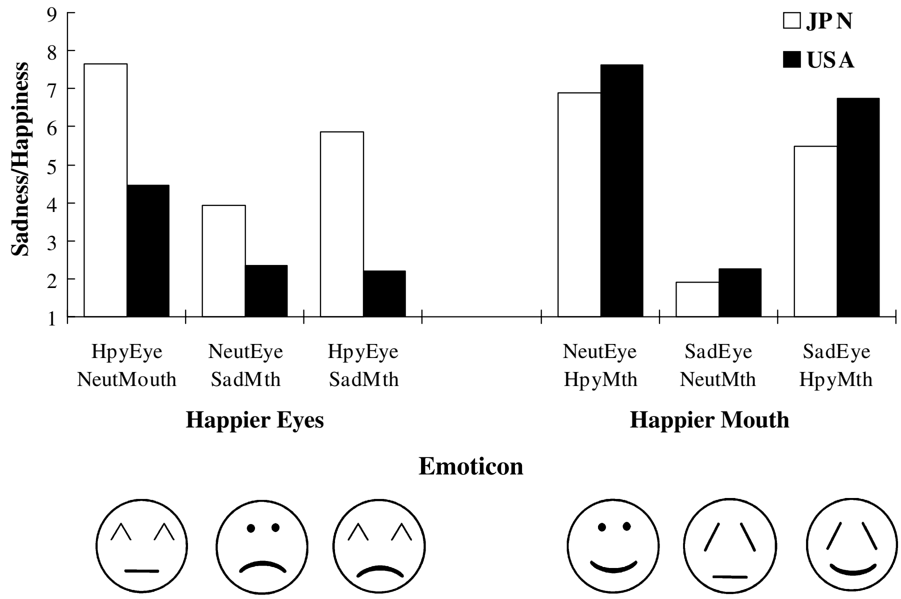

Fig. 1. Perceived sadness/happiness of emoticons, Study 1: Scale ranged from 1 (extremely sad) to 9 (extremely happy) with 5 marked as a neutral point.

Methods

Participants

One hundred eighteen (33 male and 85 female) American students at Ohio State University and 95 (72 male and 21 female, 2 gender undisclosed) Japanese students at Hokkaido University took part. Participants voluntarily signed up for the experiment in exchange for partial course credit in an introductory psychology class.

Procedure

Participants completed a questionnaire in which they were instructed to rate the emotional expressions of a number of illustrated faces (see Fig. 1).[1] Questionnaires contained six different emoticons with combinations of happy, neutral, and sad eyes and mouths: happy eyes/neutral mouth, neutral eyes/happy mouth, sad eyes/neutral mouth, neutral eyes/sad mouth, happy eyes/sad mouth, sad eyes/happy mouth (see Fig. 1). For each face participants were instructed to answer how happy or sad each emoticon looked. Response options were presented on a scale ranging from 1 (extremely sad) to 9 (extremely happy), with five marked as a neutral point. When the questionnaire was completed, participants were debriefed and thanked for their time.

Results

As our overall analysis, we ran a 2 (culture: Japanese vs. American) $\times$ 2 (gender) $\times$ 2 (happier locus: eyes vs. mouth) $\times$ 3 (combination: happy/neutral vs. sad/neutral vs. happy/sad) mixed factorial ANOVA. Results showed significant main effects for culture, $F(1,207) = 102.91$, $p < .001$, $\eta^2 = .332$, for happier locus, $F(1,207) = 45.17$, $p < .001$, $\eta^2 = .179$, and for combination, $F(2,414) = 694.11$, $p < .001$, $\eta^2 = .770$. No significant main effect for gender emerged, $F(1,207) = 2.51$, $p = .114$, $\eta^2 = .012$. In addition, significant effects emerged involving the interaction of culture and happier locus, $F(1,207) = 311.54$, $p < .001$, $\eta^2 = .601$, the interaction of culture and combination, $F(2,414) = 5.34$, $p = .005$, $\eta^2 = .025$, and the interaction of happier locus and combination, $F(2,414) = 125.02$, $p < .001$, $\eta^2 = .377$. However, these main effects and interactions were qualified by a significant three-way interaction between culture, happier locus, and combination, $F(2,414) = 29.04$, $p < .001$, $\eta^2 = .123$. No interaction effects emerged regarding participant gender, all Fs < 1.23, all ps $> .268$. Thus, subsequent analyses focused on the predicted cultural effects collapsed across participant gender.

To understand the nature of the above effects with regard to our specific hypothesis, we focused our attention on the significant two-way interaction between happier locus and participant culture. If the current results are consistent with predictions, then Japanese should rate emoticons as happier when the happier locus is in the eyes (i.e., happy eyes/neutral mouth emoticon, neutral eyes/sad mouth emoticon, happy eyes/sad mouth emoticon), whereas Americans should rate emoticons as happier when the happier locus is in the mouth (i.e., neutral eyes/happy mouth emoticon, sad eyes/neutral mouth emoticon, sad eyes/happy mouth emoticon). Results were consistent with our hypothesis. When looking at the emoticons with the happier locus in the eyes, Japanese ($M = 5.81$, $SD = .768$) rated these emoticons as happier than Americans ($M = 2.99$, $SD = .966$), $F(1,210) = 532.97$, $p < .001$, $\eta^2 = .717$. Also consistent with predictions, Americans

[1] Two different versions of the packet were created with a different order of face presentations. The order for both versions was randomly determined. Analyses indicated no significant order effects, so analyses were collapsed across both versions of the questionnaire.

($M = 5.54$, $SD = .728$) rated the emoticons with the happier locus in the mouth as happier than Japanese ($M = 4.78$, $SD = .990$), $F(1,210) = 42.07$, $p < .001$, $\eta^2 = .167$.

We then proceeded to examine how the culture × happier locus interaction varied across the three types of combinations of cues. Thus, we subsequently ran a 2 (culture: Japanese vs. American) × 2 (happier locus: eyes vs. mouth) mixed factorial ANOVA separately with each of these three combinations. For the emoticons including happy and neutral cues, results indicated a significant interaction, $F(1,211) = 274.49$, $p < .001$, $\eta^2 = .565$. Mean comparisons across cultures revealed that, consistent with our hypothesis, Japanese perceived the emoticon with happy eyes/neutral mouth as happier than Americans did, $F(1,211) = 326.10$, $p < .001$, $\eta^2 = .607$, whereas Americans perceived the emoticon with the neutral eyes/happy mouth as happier than Japanese did, $F(1,211) = 17.65$, $p < .001$, $\eta^2 = .077$.

For the emoticons with sad and neutral cues, results also indicated a significant interaction, $F(1,211) = 105.49$, $p < .001$, $\eta^2 = .333$. Mean comparisons revealed that, also consistent with our hypothesis, Americans rated the emoticon with the neutral eyes/sad mouth as sadder than Japanese did, $F(1,211) = 97.15$, $p < .001$, $\eta^2 = .315$. However, Japanese rated the emoticon with sad eyes/neutral mouth as only marginally sadder than Americans did, $F(1,211) = 3.78$, $p = .053$, $\eta^2 = .018$.

Finally, we examined the emoticons with mixed or ambivalent expressions (i.e., happy eyes/sad mouth and sad eyes/happy mouth). Because these emoticons had contradictory and competing cues in different parts of the face, they allowed us a strong and direct test of which cues were weighted more heavily by Japanese and Americans. Results once again indicated a significant interaction, $F(1,209) = 204.85$, $p < .001$, $\eta^2 = .495$. Mean comparisons revealed that, consistent with our hypothesis, Japanese perceived the happy eyes/sad mouth emoticon as happier than Americans, $F(1,209) = 266.27$, $p < .001$, $\eta^2 = .560$, whereas Americans perceived the sad eyes/happy mouth emoticon as happier than Japanese, $F(1,209) = 31.35$, $p < .001$, $\eta^2 = .130$. Thus, results were highly consistent with the overall predicted pattern of effects.[2]

[2] To rule out the present findings being the result of culture-specific response styles, we conducted a second overall ANOVA with the same mixed factorial design, but with the dependent variable (i.e., happy/sad ratings) standardized within each culture prior to the analysis. The pattern of results turned out to be identical from the analysis with the *non-standardized* measurement. In particular, the two-way culture × happier locus and the three-way culture × happier locus × combination interactions were significant ($F(1,207) = 301.24$, $p < .001$, $\eta^2 = .593$, and $F(2,418) = 24.41$, $p < .001$, $\eta^2 = 105$, respectively). Simple effects analyses yielded results virtually identical to those obtained with non-standardized measurement. In fact, standardizing results actually allowed a significant cultural difference to emerge with regard to the sad eyes/neutral mouth emoticon, with Japanese perceiving this emoticon as sadder than Americans, $F(1,211) = 75.45$, $p < .001$, $\eta^2 = .263$. Thus, the results from Study 1 are not due to culturally specific response styles.

Discussion

Results from Study 1 supported predictions. Compared to Americans, Japanese gave more interpretive weight to the eyes of emoticons, rating emoticons with the happier locus in the eyes as happier than Americans. By contrast, Americans gave more interpretive weight to the mouth when rating emotions, rating emoticons as happier than did Japanese when the happier locus was in the mouth. Our hypothesis was most strongly supported regarding the emoticons that had contradictory facial cues (i.e., happy eyes/sad mouth), indicating that Japanese weighted the cues in the eyes more heavily than Americans, whereas Americans weighted the cues in the mouth more heavily than Japanese.

However, it is important to point out one problematic aspect of Study 1, namely that Japanese and Americans tend to use different types of emoticons in computer communication. One might argue that compared to Japanese, Americans are not as familiar with the happy-eye expressions that we used for our emoticons in Study 1. Thus, confusion may have existed with regard to Americans' interpretation of the happy eyes. On the other hand, however, Japanese seemed to have little trouble interpreting the meaning of smiling and frowning mouths. Although the repeated-measures design in this study and the fact that results held across multiple types of emoticons helped to control for cultural differences in familiarity with the emoticons, the fact that there are cultural differences in emoticon usage suggests the importance of replicating these results with emotional expressions in the faces of real individuals.

Study 2

In study 2, we examined participants' interpretations of emotional expressions of photographs of real individuals. However, to control experimentally the degree to which the cues in the eyes and mouth were happy, sad, or neutral, we used computer software to create faces with different combinations of mouths and eyes taken from pre-validated happy, sad, and neutral faces of real individuals (Ekman, 1976). Ten different faces were selected, and each face was edited to form the six combinations of eyes and mouths that were used in Study 1. In this way, we were able to manipulate experimentally and independently the degree to which faces had happy or sad cues in the eyes and mouth areas.

Method

Participants

Eighty-seven (45 male and 40 female, 2 gender undisclosed) American students at Ohio State University and 89 (62 male and 27 female) Japanese students at Hokkaido University and Hokkaido University of Education took part. Participants voluntarily signed up for the experiment in exchange for partial course credit in an introductory psychology class.

Stimulus materials

Target photographs were taken from the Pictures of Facial Affect (Ekman, 1976), a set of facial expressions shown to be universally recognizable and reliable expressions of a variety of specific emotions. Similar to the procedure of de Bonis (2004), we used computer graphics software (Adobe Photoshop) to create 6 faces (one for each expression) for each of the 10 individuals. For example, the happy-eyes/neutral mouth face of each individual was constructed by starting with the neutral photograph of the individual. We then pasted the eyes area from the same individual's happy-face photograph onto his/her neutral face, the result being a face that had happy eyes but a neutral mouth. This same procedure was undertaken for each type of face for each of the 10 individuals. We paid special care so that the pasted eyes and mouth areas included the particular muscles that are crucial in emotional perception: the zygomatic major (around the mouth) and the orbicularis oculi (around the eyes). In this way, we were able to manipulate the different position of eyes and mouths in the same way for each face (see Fig. 2 for examples).

Procedure

Sessions began with two example faces taken from the Pictures of Facial Affect set (Ekman, 1976). Each face was projected onto a screen for 10 seconds, during which time participants were asked to view each face carefully and answer how happy or sad each expression was, on the same scales used in Study 1. Following these two practice trials, the main trials began. Participants saw a total of 60 faces: 6 different expressions generated on 10 different target individuals. As in the practice trials, each face appeared on the screen for 10 s, and participants were instructed to answer the question about the emotion of each face during this time. Five second intervals separated each trial. At the end of the slide show, participants were debriefed and thanked for their time.

Results

As in Study 1, as our overall analysis we ran a 2 (culture: Japanese vs. American) × 2 (gender) × 2 (happier locus: eyes vs. mouth) × 3 (combination: happy/neutral vs. sad/neutral vs. happy/sad) mixed factorial ANOVA. Results showed significant main effects for culture, $F(1, 162) = 4.69$, $p = .032$, $\eta^2 = .028$, for happier locus, $F(1, 162) = 262.86$, $p < .001$, $\eta^2 = .619$, and for combination, $F(2, 324) = 607.03$, $p < .001$, $\eta^2 = .789$, whereas a significant main effect did not emerge for gender, $F(1, 162) = 0.565$, $p = .453$, $\eta^2 = .003$. In addition, as in Study 1 significant effects emerged involving the interaction of culture and happier locus, $F(1, 162) = 101.86$, $p < .001$, $\eta^2 = .386$, the interaction of culture and combination, $F(2, 324) = 13.23$, $p < .001$, $\eta^2 = .075$, and the interaction of happier locus and combination, $F(2, 324) = 481.11$, $p < .001$, $\eta^2 = .748$. However, as in Study 1 these main effects and interactions were qualified by a significant three-way interaction effect between culture, happier locus, and combination, $F(2, 324) = 15.59$, $p < .001$, $\eta^2 = .088$. Thus, other than the lack of an overall main effect for culture, results from these overall analyses replicate those from Study 1. In addition, with regard to gender effects, the only significant effect was found for the interaction of gender and happier locus, $F(1, 162) = 4.40$, $p = .038$,

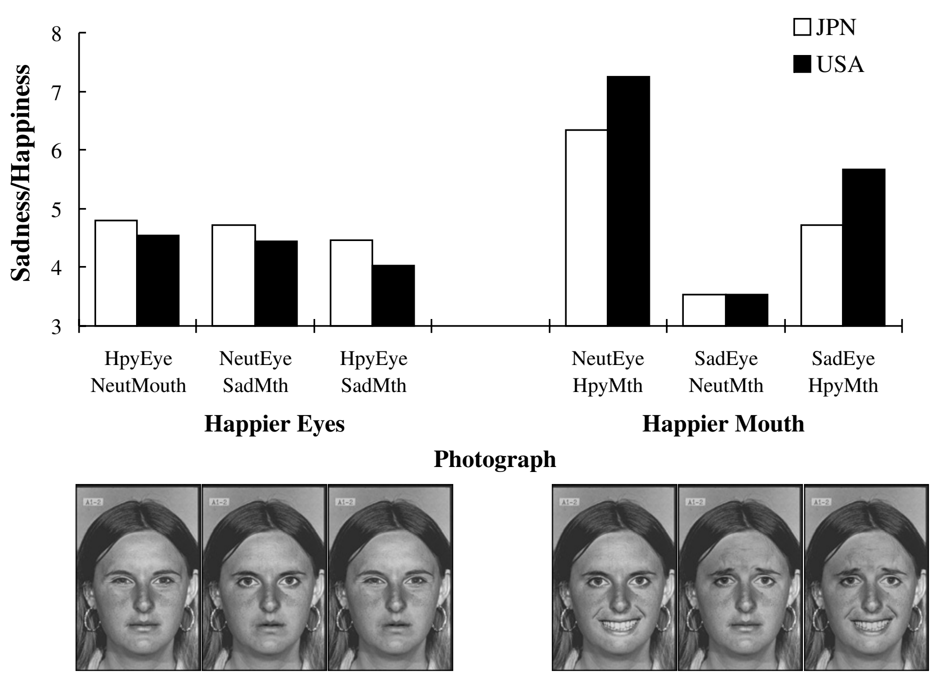

Fig. 2. Perceived sadness/happiness of edited faces, Study 2: Photographs below are examples of each eyes/mouth combination. Scale ranged from 3 (extremely sad) to 8 (extremely happy) with 5 marked as a neutral point.

$\eta^2 = .026$ (no other interaction effect was significant, all Fs < 1.90, all ps $> .17$).[3] However, because the effect was independent from the hypothesized interaction effect between culture and happier locus, subsequent analyses focused on the predicted cultural effects collapsed across participant gender (see Fig. 2).

As in Study 1, we focused our attention on the significant two-way interaction between happier locus and participant culture. Once again we examined the hypothesized pattern of Japanese rating faces with the happier locus in the eyes (i.e., happy eyes/neutral mouth face, neutral eyes/sad mouth face, happy eyes/sad mouth face) as happier than Americans, and Americans rating the faces with the happier locus in the mouth (i.e., neutral mouth/happy mouth face, sad eyes/neutral mouth face, sad eyes/happy mouth face) as happier than Japanese. Results were consistent with our hypothesis, and replicate those from Study 1. When looking at the faces with happier expressions in the eyes, Japanese ($M = 4.65$, $SD = .537$) rated these faces as happier than Americans ($M = 4.33$, $SD = .392$), $F(1, 169) = 19.88$, $p < .001$, $\eta^2 = .105$. Also consistent with predictions, Americans ($M = 5.48$, $SD = .522$) rated the happier mouth faces as happier than Japanese ($M = 4.85$, $SD = .545$), $F(1, 170) = 59.12$, $p < .001$, $\eta^2 = .258$.

As in Study 1, we then proceeded to examine how the culture × happier locus interaction varied across the three types of combinations of cues. Thus, we subsequently ran a 2 (culture: Japanese vs. American) × 2 (happier locus: eyes vs. mouth) mixed factorial ANOVA separately for each of the three combinations of cues. For the faces with happy and neutral cues, results indicated a significant interaction, $F(1, 172) = 57.63$, $p < .001$, $\eta^2 = .251$. Mean comparisons revealed that, consistent with our hypothesis, the face with happy eyes/neutral mouth was seen as happier for Japanese than Americans, $F(1, 172) = 4.86$, $p = .029$, $\eta^2 = .027$, whereas the face with the neutral eyes/happy mouth was perceived as happier for Americans than for Japanese, $F(1, 172) = 65.74$, $p < .001$, $\eta^2 = .277$. For the faces with sad and neutral cues, results again indicated a significant interaction, $F(1, 173) = 6.02$, $p = .015$, $\eta^2 = .034$. Mean comparisons revealed that the face with the neutral eyes/sad mouth was seen as sadder for Americans than Japanese, $F(1, 173) = 8.75$, $p = .004$, $\eta^2 = .048$, although no cultural difference emerged for the face with the sad eyes/neutral mouth, $F(1, 173) = 0.04$, $p = .848$, $\eta^2 = .000$.

Finally, analyses focused on faces with competing or ambivalent expressions (i.e., happy eyes/sad mouth). Results indicated a significant interaction, $F(1, 169) = 57.63$, $p < .001$, $\eta^2 = .251$. Mean comparisons of each face indicated that Japanese perceived the happy eyes/sad mouth face as happier than Americans, $F(1, 169) = 13.53$, $p < .001$, $\eta^2 = .074$, whereas Americans perceived the sad eyes/happy mouth face as happier than Japanese, $F(1, 169) = 60.54$, $p < .001$, $\eta^2 = .264$.[4]

Discussion

Results from Study 2 replicated those from Study 1. Japanese again weighted facial cues in the eyes more heavily than Americans, rating happy eyes-faces as happier, and sad eyes-faces as sadder. By contrast, Americans weighted facial cues in the mouth area more heavily than Japanese, rating happy mouth-faces as happier and sad mouth-faces as sadder. Our hypothesis was most strongly supported concerning faces that had competing emotions portrayed in different parts of the face (e.g., happy eyes/sad mouth), with the eyes emerging as the most prominent cue for Japanese and the mouth emerging as the most prominent cue for Americans.

Although results from Study 2 replicated those from Study 1, it is noteworthy that some overall expressions were rated somewhat inconsistently with the specific cues present in the faces. For example, although Japanese rated the happy-eyes faces as happier than Americans, neither Japanese or Americans rated the happy eyes faces above the mid-point on the emotion scale; in other words, faces with happy eyes were not perceived as particularly happy overall. However, this effect is likely due to the fact that although we used the eye and mouth areas from pre-validated expressions of happiness and sadness, the mouth and eyes are not perceived independently, but rather in conjunction with one another; in fact, facial expressions of most emotions involve the combination of multiple areas of the face simultaneously (e.g., Ekman & Friesen, 1975). As indicated above, a natural smile involves *both* the lifting of the zygomatic major (around the mouth) and the narrowing of the orbicularis oculi (around the eyes). Moreover, a natural frown involves *both* the drawing down of the corrugator supercilii (in the lower brow) and the lowering of depressor angluli oris (around the mouth). In the current research, our manipulation of individual areas of the face, rather than combinations of areas, is likely responsible for certain expressions being rated somewhat incongruously with the individual cues present. For example, the face involving happy eyes and a neutral mouth results in an overall expression that appears to be

[3] Females rated the faces with the happier locus in the eyes as significantly happier than males, $F(1, 165) = 7.63$, $p = .006$, $\eta^2 = .044$, whereas males rated the faces with the happier locus in the mouth as marginally significantly happier than females, $F(1, 167) = 3.52$, $p = .062$, $\eta^2 = .021$.

[4] To rule out the findings from Study 2 being the result of culture-specific response styles, we again conducted an ANOVA with the same mixed factorial design, but with the dependent variable (i.e., happy/sad ratings) standardized within each culture prior to the analysis. As in Study 1, the pattern of results turned out to be essentially identical. In particular, the two-way culture × happier locus and the three-way culture × happier locus × combination interactions were significant ($F(1, 162) = 69.34$, $\pi < .001$, $\eta^2 = .300$, and $F(1, 162) = 5.63$, $p = .004$, $\eta^2 = .034$, respectively). Simple effects analyses yielded results virtually identical to those obtained with non-standardized measurement. Thus, the results from Study 2 are not due to culturally specific response styles.

somewhat of a scowl. This effect suggests that various types of eyes/mouth combinations are perceived as gestalts rather than independently (e.g., Ekman & Friesen, 1975).

Nevertheless, it was important for the present hypothesis that we present faces in which we could independently manipulate the expressions in the eyes and mouth in a controlled manner. Although such experimentally manipulated faces allowed us to independently examine the weight given to the position of the eyes and mouth, a drawback of this procedure is that the faces are not naturally occurring expressions of happiness and sadness, resulting in an overall expression that is somewhat different than the sum of the cues present in different parts of the face. However, it is also important to emphasize that we were not concerned with ratings of the overall expressions of emotions in the present research; rather, our hypothesis concerned specific comparisons of cultural differences in interpretive weights that Japanese and Americans give to cues in the eyes and mouth. And indeed such comparisons strongly supported our general hypothesis, with Japanese rating happy-eyes faces as happier and sad-eyes faces as sadder than Americans, and Americans rating happy-mouth faces as happier and sad-mouth faces as sadder than Japanese.

General discussion

To the authors' knowledge, the present research is the first to demonstrate that people from different cultures tend to weight facial cues differently when interpreting emotional expressions. Across two studies, one using emotional expressions in facial icons and one using computer-edited photographs of real faces, results showed that compared to Japanese, Americans weighted cues displayed in the mouth more when judging emotions, whereas Japanese tended to weight cues in the eyes more than Americans.

Although the present results concerned emotion *recognition*, they are quite consistent with previous cultural theories on cultural norms for *expressing* emotions (e.g., Ekman, 1972; Friesen, 1972; Heine et al., 1999; Markus & Kitayama, 1991; Matsumoto et al., 1998). Given that the muscles around the eyes are more difficult to control than those around the mouth when a person conveys emotions (Duchenne, 1862–1990; Ekman & Friesen, 1975; Ekman, 1992; Ekman et al., 1988), the eyes of others may be most diagnostic of their true emotional state for individuals in cultures where emotional restraint is the norm, such as Japan. By contrast, in cultures where overt emotional expression is the norm, such as in the United States, the more dynamically expressive mouth may be considered a better cue to another's emotional state. Thus, typical cultural practices in expressing or subduing emotions may also be manifested in the different cues that people use to interpret others' emotions.

The current results are consistent with the dialect/cultural learning theory in emotion recognition (Elfenbein & Ambady, 2002, 2003). This theory argues that one reason why individuals may have an ingroup advantage in emotional recognition is because ingroup members are more familiar with the predominant types of facial cues used by individuals in their own cultures to convey emotions. Our results offer one potential explanation for why an ingroup advantage emerges in emotion recognition. The current research further suggests that individuals from different cultures weigh cues in the eyes and mouth differently, and thus increased familiarity with the cues that are most heavily used may actually improve accuracy in emotional decoding. Thus, the clue to accurately recognizing expressions of Japanese individuals, who are especially concerned with regulating displays of emotion, may lie mostly in cues in the eyes since the eyes are less controllable than the mouth. The same may be true of cues around the mouth area for Americans, and perhaps for other individuals from cultures where overt expression is the norm. However, it is important to emphasize that the current research did not address cultural differences in emotional *expression*, and whether or not similar cultural differences may be found with regard to how people from different cultures express emotions is an open question that needs to be addressed by future empirical research. Nevertheless, our results do offer a specific and logical explanation for what these accents or dialects may involve.

Although the current results are consistent with cultural learning/dialect theory, they are, prima facie at least, rather inconsistent with cultural decoding theory, which argues people from collectivist cultures such as the Japanese are motivated to avoid attending to diagnostic cues to preserve social harmony (Matsumoto, 1989). One possible reason for this inconsistency is that Japanese may in fact recognize diagnostic cues (such as those in the eyes) fairly accurately, but at the same time they may not necessarily explicitly call attention to them. In other words, the ability to mentally recognize emotional cues does not imply any specific overt action one would be taken in using this information, and indeed Japanese may highly motivated to keep this information to themselves (i.e., not act upon the information) if its explicit mention would damage social harmony. In addition, the finding that Japanese control the *display* of negative and positive feelings more than do Americans (Matsumoto, 1998) does not necessarily mean they cannot *recognize* emotional cues as well as Americans. Thus, an important question for future research is to distinguish between the ability to perceive information contained in emotional expressions and the different tendencies people have in displaying emotions and/or putting this information to use in social situations.

Although the overall effects in the current research were reliable and consistent with our hypothesis, it is somewhat puzzling that the effect regarding the sad eyes/neutral mouth across the two studies was somewhat unreliable. However, as some previous evidence suggests, cues in some parts in the face can be particularly impactful for some specific emotions (i.e., the irrelevance of the top half of the face to some expressions and the bottom to others, and the sheer intensity of muscle activation to draw attention to either half of the face, e.g., de Bonis, 2004) so that cultural differences may be less clearly observed. That is, it is probable that the eyes and mouth are not equally diagnostic cues for the emotions of happiness and sadness, and this may be one reason the full pattern of results did not emerge exactly as predicted across each of our six critical faces, in particular with regard to the results from our sad eyes/neutral mouth face. Thus, a good idea for future research is to present participants with only the top half or bottom half of a face without necessarily copying-and-pasting into an artificial gestalt.

We believe the current studies have a variety of important implications. First, the current results offer one explanation why in many ethnographic accounts, Japanese are often said to be expressionless or inscrutable (e.g., Benedict, 1946). It is possible that expressions by Japanese may tend to involve more of the eyes and less of the mouth than is typically the case for Westerners. Thus, although Westerners may perceive the expressions of Japanese as 'weak' or 'lacking emotion', this may instead be due to Westerners misperceiving the dominant cues that Japanese use to indicate their internal emotional state, though again the present research cannot say definitively whether this link between *expression* and *recognition* is valid. The present results also suggest the interesting possibility that Japanese may be better than Americans at detecting 'false smiles' or non-Duchenne smiles. If the position of the eyes is the key to whether a smile is false or true, Japanese may be particularly good at detecting whether someone is lying, or whether someone is expressing an emotion that is inconsistent with their true emotional state. However, these questions can only be answered with future research.

Second, the current results offer one explanation why stylized facial icons seem to differ between Japan and the Unites States. As discussed earlier, in internet text mails, Americans use emoticons that vary the direction of the mouth, i.e., :) and :(. Japanese emoticons, on the other hand, vary the direction of the eyes, and may not vary the direction of the mouth, i.e., (^_^), (; _ ;). Our results suggest the possibility that the norms for illustrations relate to the actual perception norms used in these groups.

In addition, it is important for future research to test the generalizability of the present findings. First, can the present findings be generalized to populations other than Japanese and Americans, who also have been identified as either interdependent or independent? Second, will the same cultural differences be found for additional basic emotional expressions other than happiness and sadness, such as fear, anger, surprise, and disgust? Related to this point is a possible influence of demand characteristics present in the close-ended scales as our dependent variables, with poles labeled as "happy" and "sad" (e.g., Russell, 1994). In the future, researchers should employ free descriptions of perceived emotions. In addition, it is also possible that Japanese and Americans are differentially sensitive to cues in the eyes and mouth, rather than necessarily weighting these cues differently. For example, future research is needed to address whether Japanese and Americans have different abilities to perceive cues in the eyes and mouth (sensitivity), or whether perceptions are equal but rather it is the interpretive weight given to each type of cue that varies cross-culturally (weighting). Also, the fact that the effect sizes for the illustrated faces in Study 1 were relatively larger than those of the real faces in Study 2 suggests the possibility that emotion interpretation is more complex, and perhaps meaningful, using real faces rather than illustrated ones. Finally, are there moderating effects of social context on the relative emphasis on the eyes or mouth in emotion recognition? Since previous research has noted that Japanese are especially apt to modify facial expressions according to social contexts (Ekman, 1972; Friesen, 1972), it is also possible that their tendencies in emotion recognition may also by highly context-dependent. Answering such questions will undoubtedly provide psychologists with a clearer, more comprehensive picture of the underlying reasons for cultural variation in emotion recognition.

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