

Perception of Mixed Emotion Across Cultures

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Abstract

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Perception of Mixed Emotion Across Cultures

One of the most commonly studied forms of mixed emotions is the simultaneous experience of positive and negative emotions, often termed “dialectical emotions”. Past studies have found that East Asians experience more mixed emotions than European Americans (Bagozzi, Wong, & Yi, 1999; Kitayama, Markus, & Kurokawa, 2000; Schimmack, Oishi, & Diener, 2002). However, do East Asians perceive more mixed emotion when reading others’ emotional expressions? For example, do East Asians perceive more happiness in frowning faces and more anger in smiling faces than European Americans?

Mixed Emotion Across Cultures

There has been some debate regarding whether or not people can “*feel*” both positive and negative emotions. Some researchers argue that people cannot simultaneously feel both emotions (Green, Goldman, & Salovey, 1993; Russell, 1980; Russell & Carroll, 1999), while others maintain that people can feel both emotions at the same time because positive and negative valences are independent dimensions (Cacioppo & Berntson, 1994; Diener & Iran-Nejad, 1986; Larsen, McGraw, & Cacioppo, 2001).

The experience of dialectical emotions has generally been studied in one of two ways. The first operationalizes mixed emotions in terms of the magnitude of correlation between positive and negative emotions (Bagozzi et al, 1999; Miyamoto & Ryff, 2011; Schimmack et al., 2002), while the second examines the frequency of co-occurrence of positive and negative emotions in a given situation (Larsen, McGraw, Mellers, & Cacioppo, 2004; Miyamoto, Uchida, & Ellsworth, 2010). Regardless of which method is used, East Asians reported experiencing more dialectical emotion than European Americans. The negative correlation between positive and negative emotions is stronger for European Americans, while the correlation for East Asians ranges from a weak negative to a positive relationship (Bagozzi, Wong, & Yi, 1999; Kitayama, Markus, & Kurokawa, 2000; Schimmack, Oishi, & Diener, 2002). The frequency of reporting opposite-valenced emotions is also higher for East Asians,

although this has only been found for the reporting of negative emotions in positive situations (Miyamoto, Uchida, & Ellsworth, 2010).

It follows that East Asians should also be more likely to perceive both positive and negative emotions when inferring another person's experience of emotion. A number of scholars have commented on the possibility of *expressing* mixed emotion (Ekman & Friesen, 1969; Plutchik, 1962; Tomkins & McCarter, 1964), but not on the ability to perceive mixed emotion in the expressions of others, and there been no cross-cultural research on the perception of mixed emotion. We hypothesized that East Asians not only experience more mixed emotion, but also perceive more mixed emotion.

There are a number of mechanisms that can explain the higher emotion complexity of East Asians compared to European Americans. One possibility is the tradition of dialectical thinking in East Asian, compared to the Western tradition of analytical thinking. Dialectical thinking refers to the traditional teachings of East Asia about the complementarity of opposites (i.e. the ying-yang principle) and the view that life is full of contradictions and change (Nisbett, Peng, Choi, & Norenzayan, 2001; Peng & Nisbett, 1999). This contrasts with the Western' analytical way of thinking, which is reflected in linear thinking (Ji) and a greater focus on the features of an object than its gestalt (Norenzayan). A number of scholars have suggested that the greater prevalence of dialectical thinking among East Asians leads them to perceive positive and negative emotions together more often than Westerners (Schimmack et al.; Spencer-Rogers et al).

A second possibility involves differences in the construal of the self (Markus & Kitayama, 1991). European American socialization contexts have traditionally embraced independence. The independent self-construal manifests in the emotional world as a perception of emotions as a reflection of the authentic self (Uchida, Townsend, Markus, & Bergsieker, 2009). East Asian traditions, on the other hand, have emphasized interdependence resulting in a tendency to see emotions as a reflection of the person's interactions with other people (Uchida et al., 2009; Greenfield, 2013; Kashima et al., 1992).

A recent analysis by Grossman et al (2015) showed that interdependence accounted for more cross-cultural difference than did dialecticism.

Thus, both the dialectical tradition and the interdependent way of construing the self can lead to the perception of mixed emotion. For example, when faced with a smiling face, dialectical East Asians can easily imagine how a person's situation may change for the worse, , resulting in the perception of both positive and negative emotions. Interdependent self-construal can also lead them to perceive mixed-valence emotion, by causing East Asians to guess multiple external social factors at the same time to explain a facial expression.

Culture's influence on attribution style

Cultural differences in cognitive style (Nisbett, Peng, Choi, & Norenzayan, 2001) can also affect the type of attributions people make when perceiving other peoples' emotion (Shweder & Bourne, 1984). East Asians tend to perceive complex interactions between internal and external factors, whereas European Americans often make an internal attribution and underestimate the influence of external factors (Norenzayan & Nisbett, 2000). Similarly, Morris and Peng (1994) showed that Chinese newspapers tended to explain murders in terms of the situation, whereas American newspapers were more likely to explain the murders in terms of internal dispositions of the murderers. We reasoned that cultural differences in attribution style would emerge in people's appraisal of others' emotion. People consider why the other person is feeling happiness, anger, surprise, and the like. Any expressed emotions can be the result of an innate trait, such as personality (internal attribution), or they can be the result of external factors, such as outside circumstances or other people (external attribution). Similar to our hypothesis, Masuda and his colleagues (2008) found that Japanese were more likely to reference social context in determining the emotional expression of a target individual, compared with European Americans. Thus, we predicted that East Asians would explain the emotions using more situational and fewer dispositional attributions.

General Overview of the Present Study

Our hypothesis is that when perceiving facial expressions, East Asians recognize more opposite-valence emotions in facial expressions (i.e., seeing anger in smiling faces) than European Americans. In order to test this hypothesis, we created a set of facial expressions varying in the model's gender, race, expressivity, and valence, and asked Japanese and European American participants to judge the emotions of the person in each picture with scales for perception of 13 emotions.

In order to further explore the hypothesis, Study 2 additionally observed whether participants make internal or external attributions when judging facial expressions. Our aim was to observe whether the tendency to make an internal attribution (thinking the person's emotion expression is due to one's character or personality) or external attribution (thinking that the person's emotion expression is due to external factors outside the person) differs across cultures, as well as to see if this tendency mediates the relationship between culture and the perception of mixed emotion.

In Study 3, we used an open-ended essay format to investigate the perception of mixed emotion across cultures. Our understanding of how emotions are recognized is easily constrained by the methods we use to ask about that process. Although simpler for the researcher, closed-ended methods limit the participants' possible answers and explanations to those the researcher has pre-determined as likely or appropriate. In contrast, free-response methods allow participants greater freedom to explain their process of reading facial expressions. We expected that the Japanese participants would report more opposite valence emotions than European Americans in these open-ended essays when asked about their perception of facial expressions. Also, we coded the appraisal patterns of subjects as well to get at the mechanism for dialectical emotion perception.

Study 1

Method

Participants

Eighty-one European American undergraduate students (36 women and 45 men) at a large Midwestern university (mean age = 18.95, S.D = 1.09, range from 18 to 23) and 69 Japanese undergraduate students (46 women and 23 men) from University in Tokyo area (mean = 20.27, S.D = 1.038, range from 18 to 23), participated in the experiment to fulfill a course requirement. All of the European American students self-identified as European Americans who had spent at least the first 18 years of their lives in the United States.

Materials

Stimuli for emotion judgment. We selected photographs of Caucasian and East Asian, male and female faces from a pre-tested set of stimuli (Beaupre & Hess, 2005). Digital images of 16 faces were used in a 2 x 2 x 2 [gender, ethnicity (Caucasian/East Asian), and expression (smiling or frowning)] design. There were two different individuals for each category, and participants did not see the picture of the same individual twice. For each of the faces, we created a series of stimuli that gradually morphed from neutral to extreme expressions in ten steps. All photographs, showing only the head, were presented as black-and-white passport style pictures.

Procedure. In a within-subject study, participants were asked to answer questions in a paper-and-pencil format in their native language. Each participant observed one of two sets of stimuli; each set of stimuli included eight faces, counterbalanced for targeted emotion display (smiling, frowning), model's race (Asian, White), and model's gender (male, female). Each eight faces had ten series of photos that morphed from neutral to extreme joy or extreme anger. Participants were asked to rate how strongly they thought the model felt each of 10 emotions ($0=Not\ At\ All$, $1= A\ Little$, $4= Somewhat$, to $8= Extremely$): surprise,

amusement/enjoyment, contentment/satisfaction, happiness/pleasure, pride, disgust/hate, fear, contempt/scorn, sadness, and anger.

Welch Two Sample t-test

data: dataset1 *h_dialmeanbydataset1* nation t = -6.8014, df = 111.24, p-value = 5.44e-10
 alternative hypothesis: true difference in means is not equal to 0 95 percent confidence
 interval: -1.6451947 -0.9028461 sample estimates: mean in group american mean in group
 japanese 0.367284 1.641304

Welch Two Sample t-test

data: dataset1 *a_dialmeanbydataset1* nation t = -6.2133, df = 142.54, p-value =
 5.381e-09 alternative hypothesis: true difference in means is not equal to 0 95 percent
 confidence interval: -1.4706211 -0.7607262 sample estimates: mean in group american mean
 in group japanese 1.040123 2.155797

Results and Discussions

Perception of Dialectical Emotions

To test our hypothesis about cultural difference in the perception of dialectical emotions in facial expressions, we created a variable that captured the mean number of opposite-valence emotions perceived across facial stimuli for each participant. We counted intensity ratings of 1 or higher (“a little” or more) for negative emotions in smiling faces (e.g., disgust/hate, fear, contempt/scorn, sadness, and anger) and for positive emotions in frowning faces (e.g., *amusement/enjoyment, contentment/satisfaction, happiness/pleasure, and pride*). These counts were averaged across eight faces. Using a repeated measures MANOVA, we tested for the between-subject factor of cultural group, controlling for the effects of stimuli set, and participant gender. Additionally, we controlled for the within-subject factors of valence of face (smiling versus frowning), model race (White,

Asian), and model gender (female, male). As predicted (see Figure 1), we found that Japanese participants ($M=1.88$, $SE=0.12$) reported more opposite-valence emotions than European American participants ($M = 0.72$, $SE = 0.11$; $F(1, 146) = 47.87$, $p < .001$; partial $\eta^2 = .25$, 95% [0.92, 1.63]). This finding applied to both smiling faces ($F(1,146) = 46.38$, $p < .001$) and frowning faces ($F(1,146) = 33.67$, $p < .001$).

Study 2 was designed to directly replicate Study 1 while improving the experimental method by creating more gradation in the series of faces morphed from neutral to extreme displays. We further improved our methods by randomly presenting the photographs in a computer-based study rather than paper-and-pencil study. Due to time constraints, we only presented female faces and recruited female participants from both cultural groups.

Study 2

Participants

Fifty-two female European American ($M=19.12$, $SD=1.00$) and 58 female international Japanese ($M=23.17$, $SD=3.78$) students at a large midwestern University were recruited for the study. As in Study 1, European American participants self-identified as European American and had lived in the United States for at least 18 years (average number of years outside the United States was $M=0.67$, $SD=1.12$). Qualified Japanese participants reported that they had spent no more than five years of their life outside Japan (average number of years outside Japan was $M=1.28$, $SD=1.23$). All European American participants had two parents and at least 2 grandparents who were US-born; Japanese participants' generational background was similar, with 95% having two Japan-born parents and 97% having at least two Japan-born grandparents. European American students participated in the experiment to receive extra credit for an introductory psychology course; Japanese participants received either a 10-dollar gift certificate or extra course credit as compensation. ## Procedure We used the same procedures and photographs (Beaupre & Hess, 2005) as in Study 1. For Study 2, however, four faces rather than eight faces were presented. Faces were morphed from

neutral to extreme emotion displays in twenty steps to create greater nuance than in Study 1, in which only ten steps were used. Participants completed a one-hour, computer-based (MediaLab) study in their native language. In addition to the emotion intensity scales described in Study 1, participants completed a scale of internal and external attributions of emotions. Otherwise, the procedure was the same as in Study 1.

Results and Discussions

Perception of Dialectical Emotions. To test our hypothesis about cultural difference in the perception of dialectical emotions in facial expressions, we created the same variable as in Study 1, which captured the mean number of opposite-valence emotions perceived across facial stimuli for each participant. These counts were averaged across the four faces. Using a repeated measures MANOVA, we tested for the between-subject factor of cultural group controlling for the within-subject factors of stimulus set, valence (smiling or frowning), and model race (White or Asian). Replicating the results from Study 1, we found that Japanese participants ($M=1.39$, $SE=0.15$) reported more opposite-valence emotions than European American participants ($M = 0.92$, $SE = 0.16$; $F(1, 107) = 4.88$, $p = .03$; partial $\eta^2 = .04$). There were no significant effects of stimulus, race of the model, or emotional display.

Attributional Style and Dialectical Emotions. Dispositional Attribution. We tested our prediction of cultural group differences using a repeated measures MANOVA. We tested for the between-subject factor of cultural group and controlling for the effects of stimulus set; we additionally controlled for the within-subject factors of display type (smiling versus frowning) and model race (White, Asian). As predicted, we found that European American participants ($M=5.86$, $SE=0.18$) made more attributions of the emotion to personality traits than Japanese participants ($M=3.78$, $SE=0.18$; $F(1, 101) = 67.27$, $p < .001$; partial $\eta^2 = .40$). We also found an effect for the type of emotional display, such that greater dispositional attributions were made to smiling ($M=5.81$, $SE=.16$) than grimacing faces ($M=3.83$, $SE=.17$, $F(1,101)=15.93$, $p<.001$).

External attribution. We tested The three scales of external attribution (i.e., emotion caused by others, chance, and combination of factors) were reliable ($\alpha=.83$). Therefore, a summary variable was created which captured the mean of all three scales for each participant. Surprisingly, European American participants ($M=7.03$, $SE=.15$) rated emotions as being caused more by external attributions than Japanese ($M=5.83$, $SE=.15$; $F(1, 101)=33.21$, $p<.001$; partial $\eta^2= .25$).

Difference Score between Internal Attribution and External Attribution. We computed difference score between internal attribution and external attribution (difference score: internal attribution-external attribution). We tested for the between-subject factor of cultural group and controlling for the effects of stimulus set; we additionally controlled for the within-subject factors of display type (smiling versus frowning) and model race (White, Asian). We found that both cultural groups made more external attribution than internal attribution. As predicted, however, this tendency was stronger for Japanese (internal attribution- external attribution: $M \text{ Japan} = -2.05$, $SE = .173$) than European Americans ($M \text{ Euro} = -1.17$, $.173$, $F(1, 101) = 12.76$, $p<.001$, partial $\eta^2= .11$).

Mediation of Cultural Differences in Dialectical Emotion Perception by Attribution. We

DIRECT AND TOTAL EFFECTS

	Coeff	s.e.	t	Sig(two)
b(YX)	.2320	.0751	3.0904	.0025
b(MX)	-2.1005	.2433	-8.6349	.0000
b(YM.X)	.0778	.0289	2.6960	.0082
b(YX.M)	.3954	.0949	4.1679	.0001

INDIRECT EFFECT AND SIGNIFICANCE USING NORMAL DISTRIBUTION

Value	s.e.	LL 95 CI	UL 95 CI	Z	Sig(two)	Effect
						-.1635
	.0639	-.2887	-.0382			-2.5579
						.0105

BOOTSTRAP RESULTS FOR INDIRECT EFFECT						
Data	Mean	s.e.	LL 95 CI	UL 95 CI		
CI LL 99 CI	UL 99 CI	Effect	-.1635	-.1633	.0692	-.3091
			-.0410	-.3632	-.0069	

In Study 3, we wanted to further explore attributions of emotions to investigate the reasons for the cultural differences in the perception of dialectical emotions. To do so, we used an open-ended method in addition to a closed-ended format, and content-coded participants' essays.

Russell and colleagues (1993) refer to Woodworth and Schlosberg (1954) who describe facial expressions as having emotion labels that belong to "broad, overlapping cluster[s]...rather than specific, discrete basic emotions" (348). Using the emotion terms described by participants, we created a set of emotion clusters to better capture participants' descriptions of emotions. To test our hypotheses in the open-ended emotion data, we created groups of emotion words that are similar in valence, arousal level, and how they are communicated in real world. There were three steps in creating the emotion groups. First, the first author removed subjects' demographic information from the open-ended responses and coded each emotion word. Second, the first author created emotion groups out of similar words, using labels from research on basic emotion (Ekman, 1971) and appraisal research (Smith, 1985) as a general guide. Third, for each subject we coded the group as a 1 if they mentioned at least one word in the group and a 0 if they did not.

Study 3

Participants

Participants were 304 (172 women) undergraduate students from a large university from pacific-west and two universities in Japan. 178 identified as European American (112 women), and 83 were either international students at an University from pacific-west or Japanese nationals from two universities in Tokyo (60 women). European American students volunteered in exchange for extra credit for an introduction to psychology course, and Japanese students participated in exchange for either a 10-dollar or a 1000-yen gift certificate (equivalent to 10-dollars) as compensation. ## Measures and Procedure Participants from both cultural groups completed a paper-and-pencil survey individually in their native

language. Each participant observed eight faces varying in the model's race (White, Asian), gender (male, female), and emotional display (smiling, frowning). The stimulus set was the same one used in Study 1, 2 (Beaupre & Hess, 2005). As in Study 2, we used only female faces. Participants were asked to describe in their own words what each model was feeling (e.g., "For each face, please indicate the feeling(s) of the person in the picture. You may list more than one feeling. What is Person X feeling?"), as well as their reasons for their choice of emotion (e.g., "Why do you think this person is feeling this way?") using an open-ended essay format. Lastly, participants completed a series of demographic questions, including their gender, age, and number of years they had lived outside the United States (for European American participants) or Japan (for Japanese participants). ###Content Coding of Data The coding team consisted of five research assistants (Japanese or European American). All coders were blind to the demographic information. All five coders were trained to code open-ended data until the value of the inter-rater reliability Cronbach alpha reached an acceptable level (alpha range from .91 to 1.00).

Perceived emotions coding. For emotions, we coded participants' answers to the question, "What do you think this person is feeling?" Responses were coded when the participant attributed a feeling or motivational state to the model in the picture (i.e., "She is happy"); attributions to the situation of the model, however, were not coded (i.e., "She is in a great situation"). Table 1 displays the ten emotion groups that subjects perceived from faces, which we categorized into three categories: positive (high arousal positive/low arousal positive/pride/amusement/other positive), negative (anger/sadness/disgust/contempt/fear/general unpleasantness), and other emotions (surprise/in thought/unemotional/confusion/neutral). We added "general unpleasantness (e.g., unhappy) and 'other positive' (e.g., carefree) emotion groups based on prior research from appraisal theory of emotion (Smith, 1985) because they did not seem to fit well with any other emotion group. The final set of emotions, therefore, included five categories of positive emotions (high arousal positive/low arousal positive/amusement, pride, other

positive), four categories of other emotions (surprise, in thought/unemotional, confusion, neutral), and six categories of negative emotions (anger/sadness/disgust/contempt/fear).

Internal and external attribution coding. We also coded participants' answer to the question "Why do you think this person is feeling that way?" Internal attributions were coded as present if a participant responded that a model was feeling a certain emotion because of her personality (e.g., "She is a happy and congenial person"). External attributions were coded as present when a participant's response described any situational cause of a model's emotion. We found two types of situational attributions: "Non-social" which referred to an external cause which did not involve other people (e.g., "She is frustrated that she cannot solve a difficult math problem"); and "Social" which referred to an external cause involving other people (e.g., "She looks angry and stern because she is a teacher disciplining her students" or "She is feeling happy and accomplished because she has a good family resulting in her smiling").

Results and Discussions

Number of emotion labels. European Americans ($M=1.72$, $SE=.04$) used more emotion labels than Japanese ($M=1.50$, $SE=.04$), $t(290)=3.98$, $p<.001$. *Target emotion recognition.* Both European American and Japanese participants reported the targeted emotions (happiness, anger) more than any other emotion labels (see Table X). European American participants more frequently listed the target emotion happiness for smiling displays compared to Japanese participants, $\chi^2(4, N = 292) = 126.09$, $p<.001$; a similar trend emerged for anger mentions in frowning displays, $\chi^2(4, N = 292) = 8.32$, $p=.07$.

Perception of Dialectical Emotions. We computed a percentage score for each participant of how many opposite-valence emotions they recognized in a face, divided by the total number of emotions they observed. For example, for smiling faces, a participant's score would be the number of negative emotions they listed, divided by sum of the number of negative, positive, and neutral emotions they listed for that particular stimulus. Using a repeated measure

MANOVA, we tested for the between-subject factor of cultural group controlling for the effects of participant gender; we additionally controlled for the within-subject factors of display type (smiling versus frowning) and model race (White, Asian). Replicating the results from Studies 1 and 2, we found that Japanese participants ($M=0.20$, $SE=0.01$) reported a greater percentage of opposite-valence emotions than European American participants ($M=0.14$, $SE=0.01$; $F(1, 281) = 17.39$, $p < .001$; partial η^2 $CI2 = .06$). We also found a greater percentage of dialectical emotions observed in Asian ($M=.29$, $SE=.01$) than White faces ($M=.05$, $SE=.01$), $F(1, 281)=47.69$, $p < .001$).

Attribution Style Difference. European American participants were more likely to make an internal attribution than Japanese participants (Table 3). When separately analyzed by the valence of facial expression, smiling displays produced more internal attributions than did frowning displays (Table 3). Consistent with previous literature, Japanese made more external attributions compared to European Americans for both non-social external attribution and social external attributions (Table 3).

Discussion

This research is novel in two ways. First, there is almost no research investigating the perception of mixed emotion. This cross-cultural investigation will fill in the gap in the mixed emotion literature. Secondly, this research used both an open-ended and closed-ended format, a more flexible method that allows experimenters to explore various research questions while maintain the same variable across different formats. However, there remains a crucial question we should consider for future studies. We do not know which mechanism explains why East Asians perceive more mixed emotions than European Americans. • Dialectical style • Interdependent self-construal • The perceived authenticity of facial expression

References