CULTURAL SIMILARITY'S CONSEQUENCES
A Distance Perspective on Cross-Cultural Differences in Emotion Recognition

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Previous research found null results examining predicted relationships between emotion recognition accuracy and Hofstede's cultural dimensions. Prior theory was "static," linking cultural profiles with absolute levels of emotion recognition accuracy. By contrast, a "distance" theory links cultural differences with the discrepancy in recognition accuracy achieved by members of the group posing versus the group recognizing the expressions, known as the in-group advantage. Reanalyzing data from four large-scale studies, and pooling results across studies for greater precision, we find no support for static hypotheses. Notably, no patterns differ across emotions, a central prediction by static theories focusing on decoding rules. However, analyses parsimoniously support the distance perspective. These findings add to expanding evidence for cultural differences in emotional communication.

Classic research on the universality of emotion demonstrates that people across many cultures can recognize emotional expressions at accuracy levels greater than that predicted by chance guessing (Ekman, 1972; Izard, 1971). Early pioneers focused on documenting aspects of universality in emotional judgments rather than on exploring the cultural differences that emerged in these same data (Matsumoto, 1992; Matsumoto & Assar, 1992). Rather than arguing for universality or cultural specificity in the communication of emotion, to the exclusion of the other, recent work has incorporated some elements of both into an interactionist perspective (Ekman, 1994; Elfenbein & Ambady, 2002b; Matsumoto, 1989, 2002; Mesquita, Frijda, & Scherer, 1997; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979; Russell, 1994).

Within such an interactionist perspective, researchers have attempted to explain the wide variability in emotion recognition performance across members of different cultural groups. For example, Ekman and colleagues reported accuracy rates ranging from 86% for Americans (Ekman, 1972) down to 53% for tribespeople in New Guinea (Ekman, Sorensen, & Friesen, 1969) when viewing American emotional expressions. In the most extreme case, the Bahinemo tribe they tested could not respond to the individual photographs and labeled them all as "angry" (Sorensen, 1975). Thus, members of different cultures appear to vary substantially in their emotion recognition accuracy.

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DIMENSIONS OF CULTURAL DIFFERENCE

Some investigations into these cross-cultural differences in emotion recognition accuracy have focused on Hofstede's (1983, 2001) systematic dimensions of culture. These dimensions treat culture as a theoretical variable rather than operationalizing it at the level of the nation-state (Hofstede, 1983, 2001). Indeed, theorists have argued that differences across specific groups are interesting only to the extent that they represent differences along underlying theoretical dimensions of culture (Gudykunst & Ting-Toomey, 1988).

Hofstede (1983, 2001) developed a set of four dimensions using theory on cultural differences as well as the factor analysis of a large-scale survey conducted with the employees of a U.S.-based multinational corporation. *Power Distance* reflects the extent to which members of a given culture accept unequal distributions of power within institutions and organizations. *Uncertainty Avoidance* represents the extent to which members share beliefs and build institutions that protect them from discomfort and fear of ambiguous situations. Individualism reflects a culture's emphasis on the needs and goals of individuals rather than those of tightly knit groups. Collectivist cultures tend to make greater distinctions between in-group versus out-group members, whereas individualist cultures tend to apply similar standards to all people. Numerous other theorists have focused on the importance of *Individualism* as a systematic cultural difference (e.g., Markus & Kitayama, 1991; Triandis, 1995). The dimension also serves as an indicator of economic status, as Individualism correlates highly with national wealth (Hofstede, 1983). *Masculinity* is the extent to which members of a culture prefer stereotypically masculine values such as financial and other extrinsic rewards rather than stereotypically feminine values such as caring for others. Highly masculine cultures typically have gender roles more rigid than those in highly feminine cultures. Although Hofstede (1983) found a large negative correlation between Individualism and Power Distance in his survey, he kept the two dimensions separate for theoretical reasons, as they relate to conceptually different issues.

STATIC PERSPECTIVE ON CULTURAL DIFFERENCES

Researchers focusing on Hofstede's dimensions to explain cultural variability in emotion recognition accuracy across groups have tended to take a static approach, examining the fixed attributes of the group perceiving the emotion. Using the metaphor of an analysis of variance (ANOVA), the static approach examines the main effects for perceiver groups. Thus, when examining the fixed attributes of perceivers, researchers using a static approach do not make any distinctions based on which cultural groups serve as emotion expressors. Elsewhere, this type of approach has also been referred to as "absolutist" (Elfenbein, Mandal, Ambady, Harizuka, & Kumar, 2002).

Theorists have made specific predictions for the relationships between Hofstede's cultural dimensions and corresponding accuracy levels, beginning with Gudykunst and Ting-Toomey's (1988) focus on emotional expression. Schimmack (1996) argued that differences in expression across cultures should correspond to differences in recognition due to greater practice recognizing common emotional expressions. Interpreting cross-cultural differences in emotion recognition accuracy, some theorists (e.g., Matsumoto & Ekman, 1989; Schimmack, 1996) have argued for the importance of "decoding rules" (Buck, 1984), norms managing the perception of emotion in situations potentially disruptive to social functioning. By sanctioning such perception, the members of cultural groups theorized to use decoding rules, such as the Japanese, do not report publicly their universal perception of emotional

stimuli. Decoding rules discourage accurate reporting by participants, although such theory assumes that participants do perceive the expressions privately according to biologically innate mechanisms (Biehl et al., 1997). Decoding rule theorists argue that norms focus on the perception of negative emotion, because negative expressions are more likely harmful if understood within a social context.

Researchers have investigated the relationship between these possible decoding rules and Hofstede's cultural dimensions. Matsumoto (1989, 1992) made specific predictions for these relationships. He argued that negative emotion threatens the existing social order and that groups high on Power Distance should attenuate its communication. Thus,

> *Static Hypothesis 1 (S1)*: Power Distance is associated with less accurate perception of negative emotions, but not with less accurate perception of positive or neutral emotions.

Uncertainty Avoidance relates to building institutions in order to assuage anxiety, and so high levels on this cultural dimension should predict an inhibition of recognizing expressions of fear. Thus,

> *Static Hypothesis 2 (S2)*: Uncertainty Avoidance is associated with less accurate perception of fear but not with less accurate perception of other emotions.

Individualist cultures show lower concern about the possible negative consequences of recognizing negative emotions that are potentially damaging to social relationships, and so should not attenuate such communication. Thus,

> *Static Hypothesis 3 (S3)*: Individualism is associated with the more accurate perception of negative emotions but not with the more accurate perception of positive or neutral emotions.

Masculine cultures should show greater gender differences in emotion recognition. However, this hypothesis remains untested because previous large-scale cross-cultural studies of emotion recognition did not report data separately by gender.

Research examining these hypotheses to date has found mostly null results and results counter to prediction. Matsumoto (1989) analyzed data previously collected from 15 cultural groups judging facial photographs. Power Distance correlated with lower recognition of happiness. However, contrary to hypotheses, Individualism was associated with greater recognition of happiness but lower recognition of sadness.

Schimmack (1996) suggested that the lack of support for these hypotheses resulted from methodological artifacts. In particular, the data used were average percentage accuracy values across several studies that differed in the number of multiple-choice options. Multiple-choice accuracy is generally higher when there are fewer response choices because random guessing has a greater chance of yielding the correct answer (Nunnally & Bernstein, 1994). Thus, mixing together samples with varying numbers of choices adds extra measurement error to the analyses. For null results on the dimension of Power Distance, Schimmack (1996) argued that a stronger test should distinguish between communication from superiors to subordinates and vice versa. Schimmack also argued that previous analyses confounded Caucasian racial group membership with similarity to the emotional expressors. The major studies relied exclusively on Caucasian posers, and this created a problem of "stimulus equivalence" (p. 40). Because the Caucasian groups were more individualistic and

outperformed non-Caucasian groups when judging the Caucasian stimuli, this could explain prior results found for Individualism in the direction counter to prediction. After controlling for these methodological issues, Schimmack repeated the analyses exploring the static hypotheses. He found Uncertainty Avoidance predicted lower emotion recognition accuracy overall, rather than being specific to the recognition of fear alone. Individualism still predicted greater recognition accuracy with happiness, contrary to prediction.

DISTANCE PERSPECTIVE ON CULTURAL DIFFERENCES

Other researchers examining cultural differences in emotion recognition have focused on distance attributes, which characterize the match or distance between the cultures of the emotional expressor and perceiver rather than the fixed attributes of the perceiver alone. Using the metaphor of an ANOVA, the distance approach examines the interaction between the perceivers and expressors of emotional messages. This metaphor makes clear that static and distance effects can coexist alongside each other and in general are not mutually exclusive of each other. Elsewhere, this type of approach has also been referred to as "relational" (Elfenbein, Mandal et al., 2002). The distance focus on fit or similarity rather than static characteristics parallels a shift within organizational psychology known as "relational demography" (e.g., Williams & O'Reilly, 1998). Whereas early researchers studying demographic diversity in workplace settings tended to focus on the percentage representation by group, researchers in the relational demography tradition examine background characteristics in terms of demographic similarity to colleagues rather than their membership in specific groups (e.g., Tsui & O'Reilly, 1989).

In their comprehensive review, Rosenthal et al. (1979) examined the relationship between cultural similarity to the United States—the origin of their Profile of Nonverbal Sensitivity (PONS) test—and recognition accuracy. They documented support for a "cultural proximity" hypothesis, demonstrating that PONS performance correlated highly with cultural similarity to the United States. Rosenthal et al. used ratings of overall perceived cultural similarity made by independent, untrained judges as well as graduate students in anthropology. Furthermore, accuracy also correlated highly with a range of measures of communications and other infrastructure, as well as contact with Americans. Reviewing this and other classic studies, Gudykunst and Ting-Toomey (1988) noted the important effect of cultural similarity on emotion recognition accuracy.

Indeed, recent research suggests that the match between the emotional expressor and perceiver has implications for communication effectiveness. In their meta-analysis, Elfenbein and Ambady (2002b) found evidence for an "in-group advantage" in emotion recognition. That is, accuracy appeared to be higher for emotions both expressed and recognized by members of the same cultural group. This in-group advantage, defined as the extent to which emotions are recognized less accurately across cultural boundaries, was smaller for cultural groups with greater exposure to one another, for example, with greater physical proximity to each other. Although there are differing opinions about the optimal methodology for testing the in-group advantage (Elfenbein & Ambady, 2002a; Matsumoto, 2002), the effect replicates across a range of experimental methods and nonverbal channels of communication, as well as across each of the positive and negative basic emotions. One area of theoretical—and consequently methodological—disagreement is that Matsumoto (2002) argued in favor of "stimulus equivalence":

> The characteristics of the face related to the emotion must be exactly the same between both cultures' expressors. This means that the same facial muscles must be innervated, with no extraneous muscle movements, and they must be at the same intensity levels. (p. 237)

Thus, he argues, studies are invalid if there are spontaneous cultural differences in the style and appearance of emotional expression. By contrast, Elfenbein and Ambady (2002a) argued that cultural differences in the manner of expressing spontaneous emotion are natural and are likely central to understanding the in-group advantage in emotion. Thus, they argued, a valid test of the in-group advantage cannot forcibly erase cross-cultural differences in the expression of emotion. One area of consensus about methodology is the preference for establishing in-group advantage using factorial designs balanced $n \times n$ across cultures, in which each cultural group in a study judges stimuli equally from each other's cultural group (Elfenbein & Ambady, 2002a, 2002b; Matsumoto, 2002). Balanced designs control for possible static effects in emotional expression and recognition across cultures while examining the distance effect of cultural match versus mismatch in the form of an interaction. The in-group advantage replicated when examining only these balanced studies, with results that matched those using unbalanced designs (Elfenbein & Ambady, 2002a, 2002b; Elfenbein, Mandal, et al., 2002). Thus, there is evidence for an in-group advantage in emotion even after controlling for fixed differences across cultures in expression and decoding tendencies.

Given these promising findings using a distance perspective, it would be helpful to take a distance approach to examining cross-cultural differences in emotion recognition using Hofstede's (1983, 2001) systematic dimensions of culture. Based on previous research, the hypothesis representing the distance position on cultural differences and emotion recognition is:

> *Distance Hypothesis (D)*: Greater distance between the expressor and perceiver groups, either cultural or physical, is associated with a greater discrepancy in emotion recognition accuracy.

Note that this is a directional hypothesis in that greater cultural distance is associated with greater discrepancy in emotion recognition. However, cultural distance can result equally from the perceiver group being higher or lower along any particular cultural dimension.

GOALS OF THIS STUDY

The purpose of this study is to examine both the static and distance hypotheses concerning the relationship between emotion recognition and Hofstede's (2001) cultural dimensions. A static perspective may explain some associations, whereas a distance approach may explain others. Due to the availability of data from previous large-scale studies of emotion recognition sampling widely from various cultural groups and the prior use of secondary data analysis when testing the static hypotheses, we use a meta-analysis, drawing from the available literature. Previous meta-analyses of cross-cultural emotion recognition have not tested Hofstede's (2001) dimensions of cultural variation (Elfenbein & Ambady, 2002b), or have not tested the distance perspective (Matsumoto, 1989; Schimmack, 1996). Testing these together is this study's unique contribution to the literature on cross-cultural differences in emotional communication.

Our primary focus is to explore the static and distance perspectives while bridging the two by using methods consistent with past work that tested the static hypotheses. Using the same context, a meta-analysis of previous studies provides greater methodological continuation

while making a theoretical departure. However, this decision imposes several important limitations, because the available literature does not provide the ideal source of data to test either type of hypothesis. Importantly, we attempt to distinguish between a main effect and an interaction using a series of $1 \times n$ factorial experimental designs. In spite of this limitation, this approach is worthwhile for its match with past research on the static approach that also used one-way factorial designs, which has yielded interpretations that might be more parsimoniously explained by the distance perspective. As we discuss above, static and distance effects are generally not mutually exclusive. Using the metaphor of an ANOVA, the static perspective examines the main effects, whereas the distance perspective examines the interaction. However, these two usually independent effects become collapsed together when a cross-cultural experiment is conducted using a $1 \times n$ design, rather than an $n \times n$ design. The literature of studies available for analysis does collapse these effects together, and thus this study provides an opportunity to contrast the static and distance perspectives against each other. A second important limitation of using the same meta-analytic approach as previous studies is that experimenters only from Western cultural groups conducted the existing set of large-scale studies. In the case of studies using photographs, all posers are racially Caucasian. We discuss these issues and limitations in greater detail in the discussion section. Although recognizing its limitation, the current approach is worthwhile in order to reinterpret past findings as well as to provide suggestive findings that can justify the costly collection of additional large-scale primary data in future work.

METHOD

SELECTION OF INCLUDED STUDIES

For maximum statistical power, we examined previously published studies in which multiple cultural groups judged a standardized set of emotional stimuli. Examining all trends first within each study, then pooling these effects across studies, serves as a control for idiosyncratic differences across studies and their stimuli, such as nonverbal channel of communication and the method of eliciting emotional expressions from posers. Such differences can affect the overall accuracy of emotion recognition across cultures (Elfenbein & Ambady, 2002b), and therefore calculating effects first within each study offers greater precision.

The dimensions of culture outlined by Hofstede (1983, 2001) provide data at the national level. Thus, we examined studies that included numerous national groups viewing a set of emotional stimuli originating in a separate nation. Each study includes recognition data from the same nation in which the stimuli originated as well as recognition data from at least seven other national groups. Four studies met this criterion for inclusion:

1. Ekman et al. (1987), in which participants from Estonia, Germany, Greece, Hong Kong, Italy, Japan, Scotland, Sumatra (Indonesia), Turkey, and the United States judged facial photographs of Americans;
2. Izard (1971), in which participants from England, France, Germany, Greece, Japan, Sweden, Switzerland, and the United States judged facial photographs of Americans;
3. Rosenthal et al. (1979), in which participants from Australia, Germany, Hong Kong, Ireland, Israel, Mexico, New Guinea, New Zealand, Singapore, and the United States judged dynamic facial, postural, and vocal expressions from a single American poser; and

4. Scherer, Banse, & Wallbott (2001), in which participants from England, France, Germany, Indonesia, Italy, the Netherlands, Spain, Switzerland, and the United States judged vocal expressions from German actors.

The studies are diverse in several ways, for example, their use of a variety of nonverbal channels such as facial expressions, body movements, and vocal tone. They represent the work of four different research teams. However, these studies are less diverse in other ways. Most notably, they rely on emotional expressions posed only by members of Western cultural groups. The exclusive use of Caucasian posers is an important limiting factor (Schimmack, 1996) included below in the Discussion section.

DATA CODING

Emotion recognition. Each study provided percentage or proportion accuracy data on the emotion recognition performance of participants from each national group. We used these data after correcting proportions for the degree of accuracy expected due to chance guessing, using the standard correction formula (proportion correct – [1/number of choices])/(1 – [1/number of choices]) (Nunnally & Bernstein, 1994). Table 1 lists these emotion recognition values for each study. We would have preferred to use a formula that corrects not only for the degree of accuracy due to chance guessing but also for the degree of accuracy due to response bias (Elfenbein, Mandal, et al., 2002; Wagner, 1993). However, such a correction formula requires "confusion matrices" listing the pattern of judgment errors, which only one of the four authors reported.

The operational definition of in-group advantage is "the difference between the emotion recognition accuracy achieved by the in-group versus out-group members, after the guessing correction" (Elfenbein & Ambady, 2002b, p. 208). Values for the in-group advantage in emotion recognition accuracy consisted of the corrected accuracy value attained by judges from the national group in which the stimuli originated, minus the corrected accuracy value attained by members of the other nations tested. We performed these calculations separately for each individual emotion tested, as well as for overall accuracy across emotions. See the appendix of Elfenbein and Ambady (2002a) for samples of in-group advantage calculations. Data from Rosenthal et al. (1979) do not distinguish among individual emotions, and thus this study appears only in analyses of overall accuracy levels.

For the purpose of hypotheses that distinguish between positive and negative emotion, we coded happiness as positive, neutral and surprise as neutral, and anger, fear, disgust, sadness, and shame as negative.

Cultural dimensions. Hofstede (2001) provided cultural dimension values at the national level for 66 nations and three regions, including most of the groups sampled in the four studies listed above. Analyses on cultural dimensions exclude New Guinea due to lack of cultural data. Table 2 lists these values. Uncertainty Avoidance does not correlate significantly with either Individualism ($r = -.08$, *ns*) or Power Distance ($r = .11$, *ns*). In spite of a large negative correlation between Power Distance and Individualism ($r = -.78$, $p < .001$, $n = 24$ nations), Hofstede (1983) reported that he chose to keep the two dimensions separate for theoretical reasons. Consistent with Matsumoto (1989), we exclude the Masculinity dimension from analysis, as previous studies do not provide data by gender of judges or targets, and predic-

TABLE 1
Recognition Accuracy and Physical Distance From the Origin of Study in Large-Scale Cross-Cultural Studies of Emotion Recognition

	Emotion (% accuracy)									*Physical Distance From Origin of Stimuli (1,000 km)*
Study/Nation	*Total*	*Happiness*	*Fear*	*Anger*	*Sadness*	*Surprise*	*Disgust/ Contempt*	*Shame*	*Neutral*	
Ekman et al. (1987)										
Origin of stimuli										
United States	86	94	81	78	91	91	84			—
Additional perceiver groups										
Estonia	80	88	90	62	84	93	66			7.0
Germany	77	92	84	66	80	85	55			6.7
Greece	79	92	70	73	77	90	73			8.3
Hong Kong	80	91	81	69	90	90	59			13.2
Italy	83	97	79	67	78	91	87			7.2
Japan	73	88	59	62	85	93	53			10.9
Scotland	85	98	84	81	84	86	76			5.5
Sumatra (Indonesia)	70	64	65	65	90	74	65			16.4
Turkey	77	85	72	76	72	88	70			8.4
Izard (1971)										
Origin of stimuli										
United States	81	96	73	88	70	89	81	69		—
Additional perceiver groups										
England	75	96	62	79	71	78	82	54		5.9
Germany	78	98	82	81	63	83	69	68		6.7
Sweden	81	96	87	80	67	78	86	73		6.6
France	80	94	81	90	66	82	75	74		6.2
Switzerland	77	97	63	91	66	83	75	66		6.7
Greece	72	93	63	77	48	77	86	67		8.3
Japan	60	93	52	51	62	76	49	33		10.9
Rosenthal et al. (1979)										
Origin of stimuli										
United States	56-60[a]									—
Additional perceiver groups										
New Zealand	56									14.1
Ireland	54									5.5
Hong Kong	54									13.2
Germany	54									6.7
Australia	53									15.9
Singapore	49									15.5
Israel	51									10.9
Mexico	51									3.0
New Guinea	40									14.5

(continued)

TABLE 1 (continued)

Study/Nation	Emotion (% accuracy)									Physical Distance From Origin of Stimuli (1,000 km)
	Total	*Happiness*	*Fear*	*Anger*	*Sadness*	*Surprise*	*Disgust/ Contempt*	*Shame*	*Neutral*	
Scherer et al. (2001)										
Origin of stimuli										
Germany	67	35	68	74	75				85	—
Additional perceiver groups										
Switzerland	62	44	63	74	64				64	0.7
England	61	25	63	79	78				59	0.9
Netherlands	61	31	56	83	61				71	0.6
United States	59	33	65	75	66				58	6.7
Italy	59	24	71	65	60				76	1.2
France	57	39	64	61	59				63	0.9
Spain	52	13	56	66	64				61	1.9
Indonesia	40	10	23	55	48				63	10.8

NOTE: Values listed are percentage accuracy after correction for accuracy due to chance guessing. In-group advantage for each nation can be calculated by subtracting the accuracy for each additional perceiver group from the accuracy of the group in which the stimuli originated.
a. Relevant comparison value for U.S. perceivers varies, so that perceivers from each nation are compared to the closest occupational group of U.S. perceivers.

tions under the static perspective focus on gender differences in accuracy. Distance measures of cultural difference used the Euclidean distance (Tsui & O'Reilly, 1989) between the cultural profile of each national group and that of the group in which the stimuli originated. Thus, these scores represent the difference between the cultural profiles for the expressor and perceiver groups.

Physical distance between cultural groups. Physical distance is determined by the relative location of the expressor and perceiver nations, rather than by any enduring property of a single nation. Thus, physical distance is a helpful variable to include while testing the static and distance perspectives together. The physical distance between the two countries consisted of the "as the crow flies" distance in kilometers between the capital cities of each national group and the group in which the stimuli originated. An Internet Web site (Indo.com, n.d.) makes these calculations based on the latitude and longitude positions of cities using the method outlined by the U.S. Geological Survey. In keeping with increased opportunity for cultural transmission, physical proximity is associated with greater cultural similarity ($r = .25$, *ns* for 20 national comparisons with the United States; $r = .76$, $p < .02$, one-tailed, for 8 national comparisons with Germany; $r = .43$, $p < .02$, one-tailed, for 28 nation-pair comparisons overall).

TABLE 2
Dimensions of Cultural Difference for Nations Included in Large-Scale Emotion Recognition Studies

	Cultural Dimension		
Nation	*PD*	*UA*	*IND*
Australia	36	51	90
England	35	35	89
Estonia	40	60	60
France	68	86	71
Germany	35	65	67
Greece	60	112	35
Hong Kong	68	29	25
Indonesia	78	48	14
Ireland	28	35	70
Israel	13	81	54
Italy	50	75	76
Japan	54	92	46
Mexico	81	82	30
Netherlands	38	53	80
New Guinea	78	48	14
New Zealand	22	49	79
Scotland	35	35	89
Singapore	74	8	20
Spain	57	86	51
Sumatra (Indonesia)	78	48	14
Sweden	31	29	71
Switzerland	34	58	68
Turkey	66	85	37
United States	40	46	91

SOURCE: Hofstede (2001).
NOTE: PD = Power Distance, UA = Uncertainty Avoidance, IND = Individualism.

RESULTS

STATIC CULTURAL DIFFERENCES

Is there a relationship between systematic dimensions of culture and total emotion recognition accuracy? Table 3 lists correlations between recognition accuracy levels and the cultural dimensions outlined by Hofstede (1983, 2001). The first three columns of the table display many large, and some statistically significant, associations. However, these data support none of the specific static hypotheses about cultural differences, nor any trends differing across individual emotions. Note the exclusion of Rosenthal et al. (1979) from this analysis because the study does not report data separately across emotions.

The first static hypothesis was that Power Distance is associated with the less accurate perception of negative emotions but not with less accurate perception of positive or neutral emotions. However, the first column illustrates a large negative correlation between Power Distance and all four emotional categories represented across studies, with the largest value for the positive emotion of happiness. The second hypothesis was that Uncertainty Avoidance is associated with the less accurate perception of fear but not with the less accurate

TABLE 3
Correlations Between Static Measures of Culture and Emotion Recognition Accuracy

			Hofstede Dimension			
Study	*Emotion*	n	*PD*	*UA*	*IND*	*Physical Distance*
Ekman et al. (1987)		9				
	Anger		–.08	–.10	.27	–.38
	Disgust		–.06	.10	.39	–.38
	Fear		–.63**	–.51*	.57†	–.57*
	Happiness		–.70††	.11	.73***	–.80****
	Sadness		.18	–.68††	–.27	.63††
	Surprise		–.39	.37	.35	–.53*
Izard (1971)		7				
	Anger		–.15	–.29	.49	–.90***
	Contempt/Disgust		–.20	–.34	.29	–.72**
	Fear		–.18	–.38	.38	–.63*
	Happiness		–.84††	–.72†	.64*	–.60*
	Sadness		–.49	–.80††	.90†††	–.48
	Shame		–.06	–.18	.24	–.76**
	Surprise		–.22	–.17	.39	–.60*
Scherer, Banse, & Wallbott (2001)		8				
	Anger		–.93****	–.48	.77††	–.50
	Fear		–.64*	.26	.88†††	–.76**
	Happiness		–.52	.00	.63**	–.51*
	Neutral		–.04	.31	.04	–.34
	Sadness		–.78**	–.30	.78††	–.56*
Total		24				
	Anger		–.56**	–.30	.55†	–.68***
	Fear		–.54**	–.26	.69††	–.68****
	Happiness		–.74†††	–.26	.70****	–.70****
	Sadness		–.42**	–.67††	.62†	–.09
Hypothesis			S1	S2	S3	D
Supported			No	No	No	Yes

NOTE: PD = Power Distance, UA = Uncertainty Avoidance, IND = Individualism. Rosenthal et al. (1979) excluded from analysis due to nonreporting of data separately for positive and negatively valenced test items.
*$p < .10$; **$p < .05$; ***$p < .01$; ****$p < .001$; one-tailed to reflect directional hypothesis.
$^{\dagger}p < .10$; $^{\dagger\dagger}p < .05$; $^{\dagger\dagger\dagger}p < .01$; two-tailed to reflect results in direction counter to hypothesis.

perception of other emotions. However, the second column illustrates moderate to large negative correlations between Uncertainty Avoidance and all four emotional categories represented across studies. This negative correlation reached statistical significance for sadness but not for fear. The third hypothesis was that Individualism is associated with the more accurate perception of negative emotions but not with the more accurate perception of positive or neutral emotions. However, the third column illustrates a large positive correlation between Individualism and all four emotional categories represented across studies, including the positive emotion of happiness. Thus, the data do not support the static hypotheses.

DISTANCE-RELATED CULTURAL DIFFERENCES

Is there a relationship between systematic cultural differences and the distance in emotion recognition accuracy? Several analyses provide strong support for the distance hypothesis, whereby cultural or physical distance between the expressor and perceiver groups corresponds with a greater discrepancy in emotion recognition accuracy.

First, we provide an alternative explanation for results in Table 3 that were large and significant yet failed to support the three static hypotheses. For Power Distance, the large negative correlations are consistent with the distance hypothesis, given that Hofstede's (2001) data list the cultural groups represented as posers with relatively low values on Power Distance. Thus, culturally disparate groups would have higher levels of Power Distance as well as lower emotion recognition accuracy. For Uncertainty Avoidance, the moderate to large negative correlations are consistent with the distance hypothesis, given that Hofstede's (2001) data list the cultural groups represented as posers with medium-low levels of Uncertainty Avoidance. Thus, culturally disparate groups would have either higher levels or slightly lower levels of Power Distance as well as lower emotion recognition accuracy. For Individualism, the large positive correlations are consistent with the distance hypothesis, given that Hofstede's (2001) data list the cultural groups represented as posers as relatively high on Individualism. Thus, culturally disparate groups would have lower levels of Individualism as well as lower emotion recognition accuracy. These results suggest that previously found associations between emotion recognition and absolute cultural dimensions could have instead reflected cultural differences. Thus, the significant and marginally significant results in Table 3—that might be interpreted to support the static perspective—appear to be statistical artifacts.

Second, we examine the final column of Table 3, which lists the association between emotion recognition accuracy and the strictly distance measure of physical distance between the expressor and perceiver groups. These correlations are large and significant for happiness, fear, and anger. These relationships further suggest that the significant associations between emotion recognition and absolute cultural dimensions instead could reflect cultural differences.

Third, we examine the association among distance measures of both cultural dimensions and emotion recognition. Table 4 lists the correlations between the in-group advantage in emotion recognition and cultural differences between emotional expressor and perceiver groups. In contrast with the correlations in Table 3 between static values for cultural groups and emotion accuracy, the values in Table 4 are correlations between two different types of discrepancy—cultural and emotional. Note that unlike in other contexts examining correlations among difference scores, the examination of effects first within each study prevents statistical artifacts due to the correlations between the underlying quantities. This is because each score is the difference between one number that remains constant (the baseline value for the nation in which the study originated) and another number that varies (the values for each of the multiple other national groups tested). Thus, no underlying correlations exist among the multiple components that yield the two difference scores. In support of the distance hypothesis, cultural differences along each dimension correlated with a greater discrepancy in emotion recognition accuracy. Consistent with these findings for cultural distance, there was also a significant correlation between the in-group advantage in emotion and the physical distance between expressor and perceiver groups.

TABLE 4
Correlations Between Distance Measures of Culture and the In-Group Advantage in Emotion

			Difference Along Hofstede Dimension				
Study	*Emotion*	n	PD	UA	IND	Total	Physical Distance
Ekman et al. (1987)		9					
	Anger		–.04	–.11	.27	.16	.38
	Fear		.61**	.46	.57*	.71**	.57*
	Disgust		.11	–.09	.39	.24	.38
	Happiness		.71**	–.33	.73**	.59	.80***
	Sadness		–.22	.61**	–.27	–.06	–.63†
	Surprise		.56*	–.52	.35	.22	.53*
	Total		.60**	.01	.72**	.65**	.73**
Izard (1971)		7					
	Anger		–.04	.38	.49	.39	.90***
	Contempt/Disgust		.00	.15	.29	.20	.72**
	Fear		–.07	.30	.38	.31	.63*
	Happiness		.77**	.87***	.64*	.83**	.60*
	Sadness		.39	.84***	.90***	.87***	.48
	Shame		–.18	.16	.24	.16	.76**
	Surprise		.15	.48	.39	.43	.60*
	Total		.08	.51	.60*	.53	.92***
Rosenthal et al. (1979)							
	Positivity-negativity	9[a]	.61*	.80***	.43	.57*	.15
Scherer et al. (2001)		8					
	Anger		.93****	–.02	.38	.66**	.50
	Fear		.64**	.05	.85***	.78**	.76**
	Happiness		.51	.32	.72**	.67**	.51*
	Neutral		.04	.66**	.31	.40	.34
	Sadness		.79**	–.47	.40	.46	.56*
	Total		.84***	.12	.82***	.87***	.79***
Total by emotion							
	Anger	24	.49**	.08	.40*	.43**	.68***
	Fear	24	.47**	.31	.67***	.67***	.68****
	Happiness	24	.71****	.39*	.73****	.73****	.70****
	Sadness	24	.38*	.47**	.48**	.52**	.09
	Total	33[a]	.64****	.39**	.70****	.72****	.72****
Hypothesis D Supported			Yes	Yes	Yes	Yes	Yes

NOTE: PD = Power Distance, UA = Uncertainty Avoidance, IND = Individualism.
a. New Guinea is excluded from analyses on Hofstede dimensions due to lack of data, leaving eight nations for analysis in Rosenthal et al. (1979) and 32 nations total.
*$p < .10$; **$p < .05$; ***$p < .01$; ****$p < .001$; one-tailed to reflect directional hypothesis.
†$p < .10$; two-tailed to reflect results in direction counter to hypothesis.

DISCUSSION

In the most comprehensive review of the relationship between systematic dimensions of culture (Hofstede, 1983, 2001) and cross-cultural differences in emotion recognition accuracy, this study provides strong evidence for a distance rather than static explanation of such differences. Past reviews testing the static perspective found primarily null results as well as results running counter to prediction (Matsumoto, 1989; Schimmack, 1996). This study provided a tighter level of statistical control by examining all trends first within each study and then pooling effects across studies. This pooling controlled for differences across studies that Schimmack (1996) argued were confounds in earlier work. Furthermore, we improved the generalizability of these results by examining data collected across a variety of nonverbal channels of communication—including vocal tones and dynamic video—in addition to the still facial photographs examined in earlier studies.

With these improvements in methodology, we found reliable patterns across studies that were consistent with a distance but not with a static perspective on cross-cultural differences in emotion. In particular, we found no evidence that groups in these studies differed systematically in their recognition tendencies across emotions. All effects were consistent directionally across anger, fear, happiness, and sadness. The ability to find differences across emotions is central to static theories, which argue that specific profiles on cultural dimensions are associated with specific sensitivity to particular types of emotion (Matsumoto, 1989; Schimmack, 1996). The lack of such differences across emotions speaks against these static theories.

Our findings were, however, consistent with a distance explanation of group differences. Discrepancy between the cultural profiles of the emotional expressor and perceiver groups predicted a greater gap between their corresponding levels of emotion recognition accuracy. This result was consistent across all three cultural dimensions analyzed and across all four emotions included in multiple studies. These findings suggest strongly that a distance theory can provide a parsimonious explanation of cross-cultural differences in emotion recognition. Furthermore, such theory also encompasses a simple explanation for the trends that arose while testing the static hypotheses. Although a distance framework can incorporate these findings parsimoniously, the same is not true for a static framework. Correlations between total accuracy and the physical distance between expressor and perceiver cultures provide the strongest evidence against a static interpretation. Distance is exclusively a distance-oriented measure, determined by the relative locations of nations rather than by any enduring property of a single nation. Thus, a static perspective on cultural differences cannot plausibly interpret the strong negative correlations between distance and emotion recognition accuracy.

NEGATIVE FINDINGS ON DECODING RULES

Previous explanations of cross-cultural differences in emotion recognition accuracy have focused on possible differences in decoding rules. According to the decoding-rules hypothesis, variation in recognition accuracy results from cultural norms discouraging participants from reporting accurately their true universal understanding, generally of negative emotion. Researchers have also discussed other possible mechanisms for explaining variation in accuracy, including difficulties with translation or testing procedures (Mesquita & Frijda, 1992),

and subtle differences in spontaneous emotional expressive style across cultures (Elfenbein & Ambady, 2002a, 2002b). Although the decoding-rules explanation frequently appears in discussions of the topic (e.g., Matsumoto, 1989, 1992), experimental studies of emotion recognition have not tested directly the presence of such rules. Rather, supporters infer them from the lower performance generally attained by participants from cultures visibly different from the United States and Europe.

This study contributes to data suggesting that decoding rules provide an unsatisfactory explanation for cross-cultural differences in emotional judgments, due to the lack of variation in findings across emotions (Mesquita & Frijda, 1992). In our review, we found neither evidence for the specifically hypothesized decoding rules (Matsumoto, 1989) nor, indeed, for any differences across the various emotions tested. In previous work documenting no such differences across emotions, decoding-rule theorists have switched to suggesting that decoding rules may affect all emotions (Matsumoto & Ekman, 1989), without providing evidence for this idea (Mesquita & Frijda, 1992). Given the general lack of empirical support for decoding rules, little differentiates a pan-emotional version of this theory from a post hoc observation that Western cultural groups outperform non-Western groups. By focusing on differences among perceivers rather than possible differences among expressors, decoding-rule theorists can still claim that there are no cross-cultural differences in emotional expression. By contrast, a distance theory of emotion casts the expressor as an essential actor and argues for a subtle degree of cultural specificity alongside universal emotional expression.

In addition to having little empirical support, as documented by the current article and other research, discussion of decoding rules in emotion recognition is also dissatisfying on another level. By positing the emotional inferiority of groups dissimilar to the cultures from which emotional stimuli—and consequently experimenters—originate, decoding rules take a deficit perspective to explain poor performance by non-Western groups. Then, decoding-rules theorists attribute the higher levels of accuracy frequently observed in the United States to a "pluralistic" nature of society that encourages "open or freer" use of emotion (Matsumoto, 1989, p. 81). These arguments suggest that Western groups are emotionally superior to non-Western groups. However, previous research demonstrates that Western cultures generally also suffer lower emotion recognition performance when tested with emotional expressions originating in foreign cultures (e.g., Hatta & Nachshon, 1988; Sogon & Masutani, 1989). Thus, the distance theory elaborated and tested within this article provides both a better fit with existing data as well as a more egalitarian perspective.

CULTURAL DIMENSIONS MATTER

This study did not find that absolute levels on enduring cultural dimensions accounted for predicted differences in the accuracy of understanding emotions. However, these results do not suggest the irrelevance of such cultural profiles. First, we found that cultural profiles were helpful when examined in terms of distance—that is, in terms of cultural differences between groups. Second, this review examined only context-free test settings of emotional communication rather than naturalistic settings in which cultural attributes may have more freedom to influence perception. Findings in nonverbal communication accuracy can vary greatly between artificial test settings and more ecologically valid settings (Elfenbein, Marsh, & Ambady, 2002; Lieberman & Rosenthal, 2001). In real-life, dynamic settings with ongoing relationships—rather than pencil-and-paper examinations requiring attention and response—cultural background may influence individuals' desire to acknowledge the emotional expressions of those around them. Self-report surveys examining antecedents,

preferences, understanding, and responses across particular emotions support this influence (e.g., Gudykunst & Ting-Toomey, 1988; Matsumoto, Kasri, & Kooken, 1999; Scherer & Wallbott, 1994). Conscious norms or automatic habits may, in fact, attenuate emotional perception, but an experimental context with standardized stimuli and no interpersonal threat or consequence could dampen this effect. Thus, the current results do not argue against the influence of cultural dimensions on the communication of emotion.

LIMITATIONS AND FUTURE RESEARCH

This article attempted to compare static and distance perspectives on cross-cultural differences in emotion recognition. We found a number of patterns that the distance perspective could explain parsimoniously but the static perspective could not. Analyses supported the hypothesis of the distance perspective but did not support any of the three static hypotheses. In spite of this strong evidence, the studies included do not provide the ideal source of data on this topic. Ultimately, we attempted to distinguish between a main effect and an interaction using a series of one-way factorial $1 \times n$ experimental designs. To provide a stronger test of the distance perspective, future work should test the relationship between cultural dimensions and emotion recognition accuracy using large-scale, balanced, $n \times n$ factorial designs. In these balanced designs, each cultural group judges emotional expressions equally from each other's group as well as from their own group. This would allow analyses to control for possible static effects across cultures while examining distance effects and vice versa. Because balanced designs do not collapse together static and distance effects, the two could exist alongside each other rather than in comparison.

Thus, a limitation of this study is that the current results that support the distance perspective could also reflect some support for the static perspective as well. In the current design, the two could not be fully separated. Thus, it is possible that individuals from cultures low on individualism really are inferior in the understanding of all emotional expressions—as the static perspective would interpret—rather than the distance explanation that individuals from cultures low on individualism tended to view emotional expressions that were more culturally distant, because the experiment was developed within a culture high on individualism. Likewise, it is possible that individuals from cultures high on power distance really are inferior in the understanding of all emotional expressions—as the static perspective would interpret—rather than the distance explanation that individuals from cultures high on power distance tended to view emotional expressions that were more culturally distant, because the experiment was developed within a culture low on power distance. The results for uncertainty avoidance most strongly suggest that these possibilities would represent unlikely coincidences. In general, the cultures in which the original experiments and stimuli were developed tended to have relatively medium values of uncertainty avoidance and, in the presence of medium values rather than the extreme values for individualism and power distance, correlations under the static perspective were much weaker for uncertainty avoidance. However, the current results cannot fully rule out the possibility that the positive findings for the distance perspective reflect some extent of differences in the absolute emotional skill across cultural groups.

An additional limitation of the current findings was their exclusive reliance on studies with emotional expressions originating in Western cultural groups. Thus, it is difficult to use these studies to distinguish among non-Western groups, non-Caucasian groups, and groups from cultures other than those in which the experiments originated. In future research, it

would be worthwhile to include emotional expressions representative of a wider range of cultural groups.

This study was further limited by a low level of statistical power, due to the use of the nation as the unit of analysis. No individual study used more than nine separate nations of perceivers in addition to that in which the stimuli originated. However, values for each nation were aggregates across multiple participants and thus were more stable estimates with a lower level of measurement error than data from a single participant. Furthermore, the statistically significant findings resulting from these small samples suggest that effects testing the distance perspective may be associated with unusually large effect sizes.

A NEW STAGE IN EMOTION RESEARCH

Ekman et al. (1987) ended their paper with the conclusion that "the evidence now for universality is overwhelming, whereas that for cultural differences is sparse" (p. 717). This discrepancy in evidence might have been true in 1987, but it is not the case today. A large-scale empirical review has compiled several decades worth of research supporting an in-group advantage in emotion recognition (Elfenbein & Ambady, 2002b). That is, emotion recognition appears to be more accurate when perceivers judge emotional expressions from members of their own cultural group. This article contributes to this growing area in the cross-cultural psychology of emotion. Because most scholars accept that certain facial expressions can be recognized at levels above chance guessing (Russell, 1994), basic universality is no longer the focus. Thus, we can recognize basic universality while moving beyond it. Just as emotional expression may be a universal "language," different "accents" or "dialects" may vary in subtle ways across cultures (Elfenbein & Ambady, 2002a, 2002b; Marsh, Elfenbein, & Ambady, in press). We can likely better understand emotions expressed in a familiar style. This notion forms the core of a distance perspective on cross-cultural differences in emotion recognition: The match between a message's expressor and perceiver has an important impact on communication accuracy. In the current findings, this similarity appeared to be more informative than the fixed attributes of the perceiver.

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