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# Shared Knowledge About Emotion Among Vietnamese and English Bilingual and Monolingual Speakers

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## Abstract

Recent empirical findings show strong similarity in the structure of emotion space across highly diverse cultures. Previous researchers believe this demonstrates shared conceptual understanding of emotion. However, similarity may emerge from sources such as similar language structure operated upon by pan-human categorization processes. Thus, existence of a superordinate concept of emotion may be prerequisite to similar categorization of emotion terms. Within a broader emotion category, cultural differences may be strongest for subordinate terms that convey contextualized information. To explore this, the authors replicated studies of Chinese and Japanese, comparing emotion term similarity judgments for monolingual and bilingual Vietnamese and English speakers in the United States and Saigon, Vietnam. Participants showed strong consensus about meanings of 15 emotion terms, with differences for two subordinate-level terms, “shame” and “anguish.” Judgments for bilingual participants mirrored those of monolinguals in each language, indicating code switching. The Interpoint Distance Model was applied to interpret the results.

## Keywords

emotion terms, emotion naming, emotion lexicon, similarity judgments, emotion categorization, Vietnamese, cross-cultural emotion

Empirical findings of Romney and colleagues (Moore, Romney, Hsia, & Rusch, 1999; Romney, Moore, & Rusch, 1997) present an explanatory challenge for those studying how emotional meaning is constructed in such widely varying cultures as collectivist Japan and China compared to individualist Great Britain and the United States. Despite strong differences in emotional experience and social organization across these cultures, Romney et al. found little difference in the meanings of emotion terms and the structure of the emotion meaning space. When cultures

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differ in important ways, so should their construction of emotion and the lexicons that encode emotional meaning, yet they did not.

In past decades, such a finding might fuel the debate between universalists and relativists. Cross-cultural variability supported social construction, while cross-cultural homogeneity of response supported a biologically based pan-human emotional experience. Today, while some theorists emphasize differences and others similarities, many theorists acknowledge that construction of emotional meaning involves some interplay between cultural influence, personal experience, cognitive processes, and biology (Barrett, 2006; Barrett, Lindquist, & Gendron, 2007; Barrett, Mesquita, Ochsner, & Gross, 2007). The challenge now is to develop methods for studying the respective contributions of these influences and the mechanisms of construction of emotional meaning.

The recent empirical findings by Romney and colleagues (Moore et al., 1999; Romney et al., 1997) also show that individual differences within each culture greatly outweigh cross-cultural differences in emotion knowledge. This is problematic for extreme versions of both the universalist and cultural relativist perspectives. If emotional meaning arises from pan-human biology, then large within-culture individual differences imply either corresponding large individual differences in emotion physiology or a minor role for shared biology in the construction of emotional experience. On the other hand, extreme relativists must explain how the finding of strong similarity across cultures originates and why shared cultural experience does not seem to impose a distinct within-culture response. Cultural transmission of emotion knowledge assumes that language plays a role in regularizing experience, presumably by imposing culturally shared schemas that permit meaningful communication. How can emotion language play a strong role in construction of emotional experience while accounting for less variability than individual differences?

Theorizing based on inductive approaches involving linguistic analysis, ethnographies, and qualitative studies begins to answer such questions (Barrett, 2006), but such research must ultimately generate predictions that can be tested. The scaling studies conducted by Romney and colleagues are important because they can test points of difference suggested by ethnographies and qualitative approaches, quantify differences and similarities, and reveal underlying principles of lexicalization and categorization in a systematic manner. This approach demonstrates a method for combining the wisdom of qualitative approaches with the precise description, model-building, and generalization of theory-based explanation. A focus on the patterns of cultural similarity and difference demands such a method for making meaningful comparisons across cultures. Beyond this, the goal of a quantitative approach is to change the level of explanation from broad statements and ad hoc kludges to a description of the mechanisms that produce observed similarities and differences. We think this can be best accomplished using probabilistic mathematical approaches. We argue for a robust process model of categorization and naming, capable of prediction of results for unexplored ethnolinguistic cultures (i.e., cultures different than those used to derive the models). The work reported here is a step toward that goal.

Previously, we have applied an Interpoint Distance Model (IDM) to the domain of color terms to conceptualize the interplay between cognitive processes, cultural constraints, language, and individual differences at the neurophysiological level. Emotion is no less complex than color, with many of the same constraints; thus, a similar approach to modeling may be useful. We applied the IDM to our results in this study because we believe that cultural specifics, context, task demands, and the need to communicate all constrain naming to produce both similarities and differences in the emotion lexicon. A complete model must take all of these influences into account. We believe that small stimulus-set scaling studies, precisely because they are limited, can effectively test model predictions and measure differences related to culture and other important variables affecting the use of language. Although we use the same approach as Romney and

colleagues, their analysis focused on apportioning sources of variability to culture versus individual difference and error, with minimal interpretation of findings relevant to emotion theory. Our study replicates theirs with Vietnamese speakers, but we further analyze results in the context of emotion theory and illustrate the possibilities of this approach for studying emotion categorization. Additionally, we conducted within-subject comparisons of bilingual Vietnamese speakers, rare even in studies of bilingual processing (Pavlenko, 2008).

### *Some Technical Considerations*

Historically, approaches to comparing meanings of words across languages have involved direct translation. In this study, we compare the second-order relationships among the meanings of emotion terms instead of their translations. This approach lets us evaluate similarity of meaning without studying the lexicons of different languages (number and type of emotion terms), the linguistic structure of such languages, or emotion primitives, although such understanding is essential to interpreting results. This gives our approach greater independence from theoretical assumptions. Our approach is not to be confused with use of scaling to investigate the dimensionality of emotion space, which clearly depends on how the domain is sampled. Our approach requires only that an equal number of items be selected. The similarity or difference in word meaning is an empirical matter that is revealed by the choices of the participants, not assumed by the stimulus-selection choices of the researchers.

The paradigm for exploring second-order relationships, first applied to emotion naming by Alvarado (1996), draws on techniques developed by Batchelder and Romney (1988, 1989) for use in anthropological settings where there is no *a priori* knowledge about a culture or its informants. We tested naming in two ethnolinguistic cultures: (1) monolingual and bilingual speakers of English in the United States and (2) monolingual and bilingual speakers of Vietnamese in the United States and in Vietnam. We compare our results to previous studies of Japanese and Chinese naming (Moore et al., 1999; Romney et al., 1997) and to previous cross-cultural scaling studies of the emotion lexicon (Heider, 1991; Russell, Lewicka, & Niit, 1989; White, 1994). The paradigm is described below.

According to Romney and Moore (1998):

a semantic domain may be defined as an organized set of words, *all on the same level of contrast*, that refers to a single conceptual sphere. The set of words are exemplars of a single superordinate category, such as animals, colors, or birds. . . . Note that a semantic domain does not include the superordinate term. . . . The structure of a semantic domain is defined as the arrangement of the terms relative to each other as represented in some metric system such as Euclidean space and described in terms of a set of interpoint distances. It is assumed that each individual has an internal cognitive representation of the semantic structure of the terms. The meaning of each term is defined by its location relative to all the other terms. . . . [This model] provides us with a fully quantified structure for the measurement of every term relative to every other term. It allows the precise measurement of the overall degree of sharing among the members of a culture as well as the extent to which each individual participates in the common understanding. (p. 315).

Romney and Moore (1998) stress a Euclidean distance model that measures metric distances among items; we use the IDM developed by Jameson and D'Andrade (1997). The IDM emphasizes the relational structure among items without assuming a metric space, stressing the ordering relations among the items, not their metric distances. Jameson and Alvarado (2003) propose that a *naming function* provides a means of reconciling individual differences in subjective experience

with a shared cultural understanding embodied in the lexicon. The IDM model proposes that the active mapping of terms to the experiential meaning space is flexible, varies for individuals, but is also accomplished under the constraints of communication. The result is a rule-governed assignment of names to experiences that varies with both task demands and social demands. The specific cognitive processes that accomplish this mapping, still debated by categorization theorists, need not be specified in order to analyze the structure of meaning within a domain (e.g., emotion, colors). Both the theory of culture proposed by Romney, Weller, and Batchelder (1986) and the IDM developed by Jameson and D'Andrade (1997) are neutral with respect to how cognitive mapping and categorization occur.

### *Selection of Stimuli*

The studies replicated in this report (e.g., those by Romney and colleagues) do not systematically sample the emotion space. Their stimulus lists included the most frequently occurring and culturally salient terms elicited by free listing tasks in the respective cultures, supplemented by terms considered theoretically important by previous researchers such as Russell (1980). Low frequency terms and any terms for which a reasonable translation did not exist in both cultures were excluded. In our replication, we maintained comparability by presenting equivalent versions of the same set of terms used by previous researchers, verifying that the terms were salient for Vietnamese using a free-listing task.

It might be argued that selecting the most frequently occurring (salient) terms guarantees similarity of meaning across cultures. However, the word that comes most readily to mind within one culture need not be one with shared meaning across cultures. In fact, our results showed that not all of the terms that were free-listed had similar meanings across cultures. Because our terms were translated from one language to another, some similarity is table, but our question is whether strong cultural differences affect the understanding of terms existing in both cultures. It is true that the most salient and frequently listed items tend to be those with greater shared knowledge within a culture, but we believe that cross-cultural agreement about meaning also depends on similarity in the structure of the emotion lexicon and corresponding emotion meaning space. Cultures without a superordinate term for emotion would produce considerably less agreement, because their category structure for emotion (meaning space) would be very different, not because native speakers listed terms with greater or less frequency (S. T. Smith & Smith, 1995).

Obviously, the 15 words used in these scaling studies are not a systematic sampling of the domain of emotion terms. The stimulus set size is limited by the triad methodology. An advantage of modeling subsets of the emotion lexicon is that cultural differences can be better characterized quantitatively, making comparisons across cultures more precise. Such methods enable differences identified via other approaches, such as ethnography, to be systematically explored.

Selection of stimuli in scaling studies has varied with the goals of research. Those studying universality have presented basic-level stimuli, not subordinate terms. By definition, *basic* emotion terms are decontextualized, whereas subordinate-level emotion terms encode the specifics of emotional context (e.g., time, place, person, situation, relationship, and perhaps also appraisals and action tendencies). In the literature, scaling studies presenting a small number of basic emotion terms tended to produce solutions with reasonably clear-cut dimensionality in which terms formed a circumplex. This emphasis on basic terms as stimuli has obscured the sensitivity of scaling solutions to important cultural differences when subordinate-level terms are stimuli. For example, Shaver, Wu, and Schwartz (1992) and Romney et al. (1997) both found cultural-specific differences in responses to words related to shame, comparing Chinese or Japanese and English, consistent with cultural differences in the social importance of shame identified using more qualitative methods.

This research used techniques like those of Romney and colleagues (Moore et al., 1999; Romney et al., 1997) to compare English with Vietnamese emotion naming. It includes scaling studies presented to five different ethnolinguistic groups: (a) monolingual native speakers of English in the United States, (b) bilingual native speakers of Vietnamese responding in English in the United States, (c) the same bilingual native speakers of Vietnamese responding in Vietnamese in the United States, (d) monolingual native speakers of Vietnamese in the United States, and (e) monolingual native speakers of Vietnamese in Saigon, Vietnam. The results are analyzed using multidimensional scaling (MDS) and consensus analysis (Batchelder & Romney, 1988, 1989). We expect to find results closely similar to those of Romney and colleagues for Chinese and Japanese participants. However, we also expect to find differences for subordinate within-category terms that encode culturally specific distinctions.

## Method

### *Participants*

Each group consisted of 30 participants, balanced between males and females. Groups 1, 2, and 3 were undergraduate students participating for course credit recruited from the human subject pool at the University of California–San Diego. Bilingual students were excluded from the monolingual English group. Bilingual Vietnamese students were recent immigrants of varying acculturation. Bilingual participants were pre-tested for ability to recognize all emotion terms in both English and Vietnamese and respond to task instructions presented in Vietnamese and English. Monolingual Vietnamese in the United States were recruited via flyer (in Vietnamese) in a Garden Grove, California, library. They were tested in the library public meeting room and paid \$20. Many spoke one or more additional Asian languages, but those bilingual in English were excluded. Participants were pre-tested in the same manner as the bilingual Vietnamese participants. Monolingual Vietnamese in Saigon, Vietnam, were second-year university students, recruited from a college course and paid an amount in Vietnamese currency equal to that in the United States.

Ages of student participants ranged from 17 to 44 but averaged close to the university norm for all groups. Monolingual Vietnamese (United States) ranged in age from 17 to 73, with a mean of 43. Vietnamese immigrated to the United States in distinct waves: (a) during the mid-1970s with the fall of Saigon, then (b) as economic refugees admitted in the late 1980s and early 1990s. The earlier group was typically of higher socioeconomic status and better educated than the later group, comprised of people spending considerable time in Hong Kong or Taiwan awaiting admission to the United States. The Vietnamese language has three distinct dialects spoken in Southern, Middle, and Northern Vietnam. This diversity is reflected in our sample.

### *Materials*

To maintain comparability with previous studies (Moore et al., 1999; Romney et al., 1997), we presented the same emotion terms translated from English into Vietnamese (see Table 1). Salience of these terms in Vietnamese was verified by a free listing task presented to the monolingual speakers in Saigon. Instructions for completing the task were presented in English for English terms and in Vietnamese for Vietnamese emotion terms. A Vietnamese font (including diacritical marks) was used for instructions and stimuli.

Translations of Vietnamese terms and instructions were generated by members of the Vietnamese immigrant community, back-translated, and discussed to obtain agreement by five highly educated native speakers of Vietnamese. As confirmed by pre-testing and debriefing questions,

**Table 1.** Emotion Term Stimuli in English and Vietnamese

English	Vietnamese
anger	giận hờn
anguish	khổ não
anxious	lo âu
bored	chán nản
sad	buồn
disgust	ghê tởm
envy	ghen tị
excitement	sự thích thú
fear	sợ
happy	vui
hate	ghét
lonely	nơi ñau khổ
love	yêu
shame	xấu hổ
tired	mệt mỏi

all translated terms were familiar to all who participated at the University of California–San Diego, in Garden Grove, California, and in Saigon, Vietnam.

### Procedures

Romney and colleagues found no differences between paired-comparison and triad tasks, so we presented only a triad task, following their procedures. Participants were tested individually. Bilingual Vietnamese participants completed the questionnaires twice, once in Vietnamese and once in English, with the order counterbalanced. Each triad consisted of three emotion terms presented on the same line. Participants were asked to select the item that was most different in meaning from the remaining two (Weller & Romney, 1988). As in previous studies, a lambda-3 balanced incomplete block design (Burton & Nerlove, 1976) was used, resulting in 105 triads with the order individually randomized for each participant. Generation of the questionnaires and unrandomization was performed by Anthropac software (Borgatti, 1993).

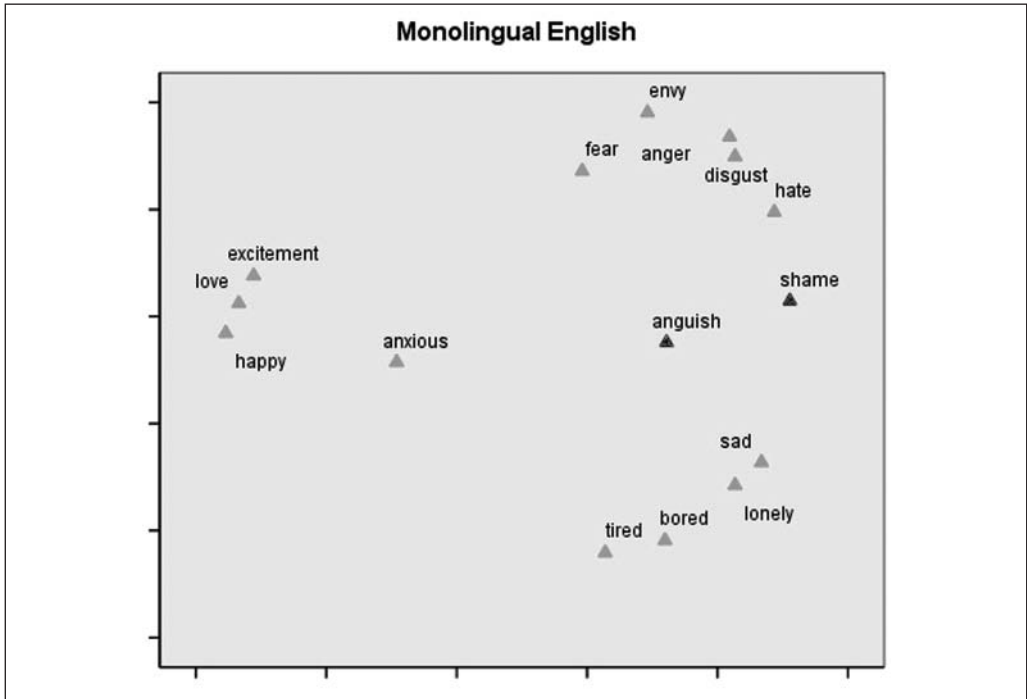
### Results

Three types of analyses were performed on the triad task data for the five groups: (a) MDS, (b) consensus analysis of the choices made for each triad set, and (c) comparison of the consensus analysis answer keys.

#### MDS

The triad task similarity judgment data were compiled into a similarity matrix as described by Moore et al. (1999, p. 533). This was input to minimum-residual MDS to produce two-dimensional solutions for each of the groups. Stress ranged from .189 to .199 and was highest for the bilingual and monolingual English speakers, with little difference in stress across the solutions. Stress is relatively high because the solution was constrained to two dimensions.

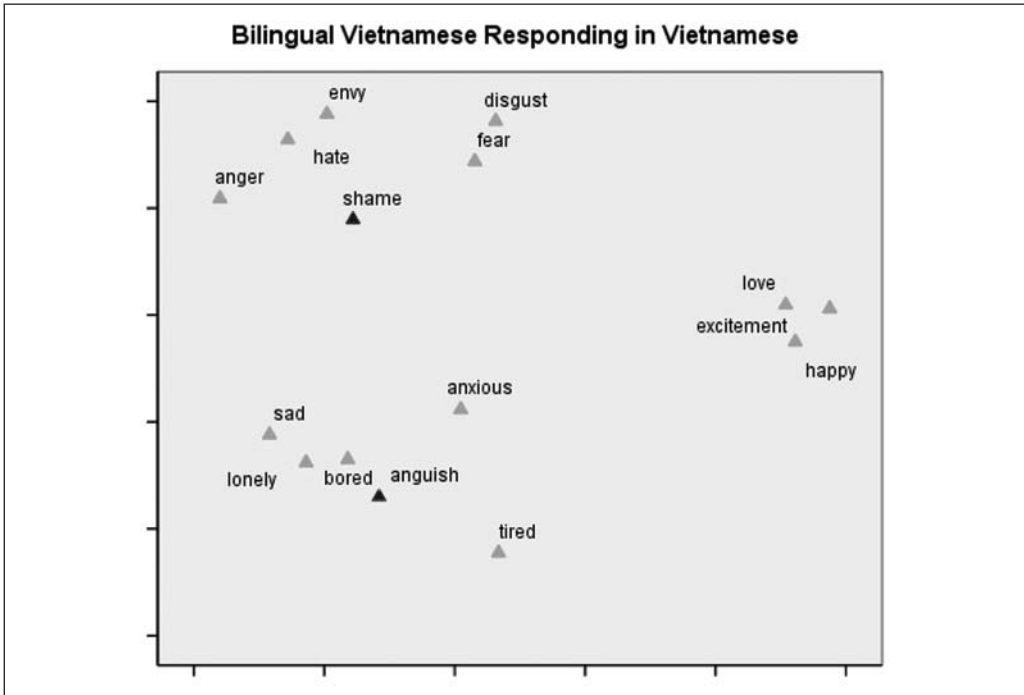
The resulting MDS plots are shown in Figures 1 through 5. Items appearing closer to each other in these plots are more similar in meaning than those more distant. A cluster occurs when items within a group are all closer to each other than they are to items in other clusters. Such a



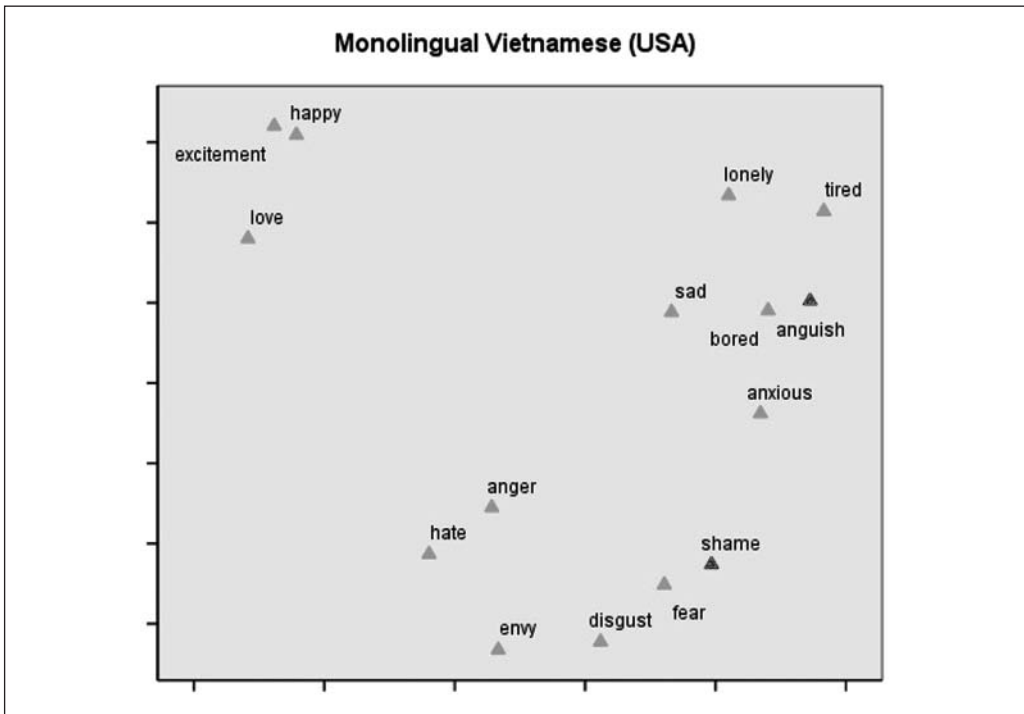
**Figure 1.** MDS Plot of Emotion Term Triad Judgments for Monolingual English Speakers (Two Dimensions, Stress = 0.198)



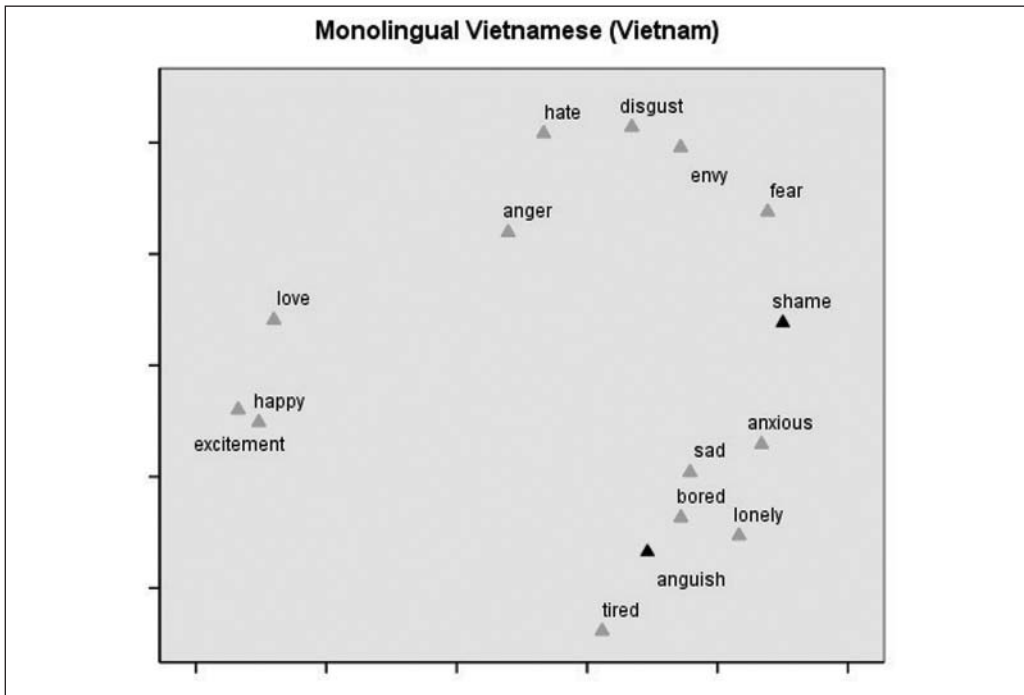
**Figure 2.** MDS Plot of Emotion Term Triad Judgments for Bilingual English/Vietnamese Speakers Responding in English (Two Dimensions, Stress = 0.199)



**Figure 3.** MDS Plot of Emotion Term Triad Judgments for Bilingual English/Vietnamese Speakers Responding in Vietnamese (Two Dimensions, Stress = 0.189)



**Figure 4.** MDS Plot of Emotion Term Triad Judgments for Monolingual Vietnamese Speakers in the United States (Two Dimensions, Stress = 0.196)



**Figure 5.** MDS Plot of Emotion Term Triad Judgments for Monolingual Vietnamese Speakers in Saigon, Vietnam (Two Dimensions, Stress = 0.194)

plot may be considered a map of the meaning space, showing relations among mental representations of items within memory. Similar judgments about items arise from similar representations of items within memory in each language group. Plots may be rotated around the  $x$ - or  $y$ -axis without affecting the ordinal relations among the items. Figure 3 is thus similar to the other plots. Axis scale numbers have been omitted to emphasize the ordinal relations, not metric distances.

Because there is consensus (described in the next section), the relationships in the plots may be generalized from individual group members to their samples, and with random sampling, to ethnolinguistic cultures. Note that the plots all show a closely similar arrangement of items with few variations across groups. This strong similarity in the positions of items within the plots indicates that there exists a closely similar interpretation of the meanings of the emotion terms among members of the groups in this study.

All five plots show a clustering of 12 of the 15 items into the same three groups. There is an obvious split along the dimension of valence (positive and negative terms) and a subdivision of the negative terms along the dimension of arousal. Love, excitement, and happy are grouped together in all five plots. Higher arousal negative items were grouped together in all five plots: anger, hate, envy, disgust, and fear. Lower arousal negative items were also grouped together in all five plots: sad, lonely, bored, and tired. Placement of three terms (anxiety, anguish, and shame) varies across the groups. For Vietnamese speakers, anxious appeared in the low arousal cluster. For English speakers, anxious was grouped with positive terms. This may have occurred because anxious was considered similar to excitement but unlike the other negative terms. Anxiety is not considered an emotion by some theorists, nor does it group with other emotions in Ortony, Clore, and Collins's (1988) taxonomy.

In contrast to the Vietnamese groups, the two English-speaking groups isolated the terms anguish and shame into a fourth category midway between the two negative emotion clusters, suggesting

that they were less similar to items in other clusters than to each other. All Vietnamese plots place shame with the high arousal negative terms and anguish with the lower arousal negative terms. The different emphasis on shame in collectivist cultures compared to the more individualistic American culture has been noted (Markus, Kitayama, & Matsumoto, 1995; Miyake & Yamazaki, 1995; Rodriguez Mosquera, Manstead, & Fischer, 2000; Russell & Yik, 1996), as has a distinction between shame and guilt cultures (Benedict, 1946; Mead, 1934; see Miyake & Yamazaki, 1995, for a caution). The grouping of anguish with low arousal negative terms may also be due to our Vietnamese experts' translation of anguish as *co non* (which also translates as miserable) instead of *su lo buon*, as one dictionary suggests (Nguyen, 1967). *Su* is an optional intensifier, *buon* means sad, and *lo* is part of the word anxious, with the whole denoting a kind of intense agitated sadness.

### Consensus Analysis

Consensus analysis was used to measure the extent of shared knowledge within groups and the agreement between the Vietnamese and English speakers. A formal mathematical description is provided by Batchelder and Romney (1988, 1989; see also Romney, 1989, 1998, 1999; Romney, Batchelder, & Brazill, 1995; Romney, Boyd, Moore, Batchelder, & Brazill, 1996; Romney, Brewer, & Batchelder, 1993).

Consensus analysis is a formal computational model that uses the pattern of responses within a data set to (a) predict the likelihood of correct response for each participant (called the competence score), (b) provide an estimate of the homogeneity of response among participants (the mean competence), and (c) provide confidence estimates for the correctness of each potential response to a set of questions. Batchelder and Romney (1988, 1989), Romney et al. (1986), and Weller and Romney (1988) suggest three criteria for assessing consensus: (a) Eigen values showing a single dominant factor (a ratio greater than 3:1 between the first and second Eigen values), (b) mean competence greater than .500, and (c) absence of negative competence scores among participants. Establishing these criteria permits a more objective evaluation of whether results reveal homogeneity of response, addressing Russell's complaint that researchers have no way to decide how much agreement short of 100% is sufficient in order to claim that participants agree (Barrett, 2006; Russell & Fehr, 1994).

Consensus analysis was applied to the similarity judgment data for all five language groups. Mean competence scores are shown in Table 2. All five groups meet the requirements for consensus described above. Consensus is highest for bilingual speakers responding in Vietnamese, consistent with our previous studies of bilingual speakers (Alvarado & Jameson, 2002). Agreement is generally greater when fewer fine distinctions are drawn during a task; therefore, bilingual speakers may show stronger consensus because subtleties of Vietnamese are being lost while subtleties of English have not yet been mastered. Consensus among monolingual Vietnamese speakers may be lower than for monolingual English speakers due to inclusion of regional dialects in the Vietnamese groups. Note that consensus improves when the three Vietnamese groups are merged into a single Vietnamese speaking group.

More importantly, when the English and Vietnamese speakers are merged into one group, the resulting group not only meets the requirements for consensus, but its mean competence increases compared to the Vietnamese group. Its mean decreases only slightly compared to the monolingual English group. Introduction of divergent responses into a data set generally results in an increase in variability and a decrease in agreement among respondents (lower mean competence) but that did not occur when we merged the data for our two language groups. This result could not occur without strong similarity across the five groups.

**Table 2.** Comparison of Mean Competence Scores for Each Language Group ( $n = 30$ )

Group	M	SD	Eigenvalue Ratio	Negatives
Monolingual English	0.616	0.148	15.298	0
Bilingual Vietnamese in English	0.601	0.209	9.766	1
Bilingual Vietnamese in Vietnamese	0.686	0.157	16.243	0
Monolingual Vietnamese (United States)	0.519	0.272	9.236	1
Monolingual Vietnamese (Vietnam)	0.550	0.175	5.568	1
Both monolingual Vietnamese groups combined	0.565	0.219	8.382	1
All Vietnamese groups combined	0.603	0.209	10.372	1
All groups combined	0.590	0.192	9.665	2

**Table 3.** Goodman & Kruskal's Gamma Measures of Agreement Between Triad Answer Keys<sup>a</sup>

Key	ME	BE	BV	MV	MVS	Both	Three	All
Monolingual English (ME)	—							
Bilingual English (BE)	.773	—						
Bilingual Vietnamese (BV)	.822	.657	—					
Monolingual Vietnamese (MV)	.842	.686	.974	—				
Monolingual Vietnamese, Saigon (MVS)	.813	.641	.974	.998	—			
Both monolingual Vietnamese groups	.823	.657	.975	.998	1.000	—		
Three Vietnamese groups	.855	.699	.978	1.000	.998	.999	—	
All five groups combined	.822	.657	1.000	.974	.974	.975	.978	—

a. All gamma values significant,  $p = .000$ , for 105 trials.

### Answer Key Comparison

A direct measure of agreement about emotion term meaning can be made by comparing the answer keys predicted by consensus analysis for each group. Consensus modeling uses the inter-correlation of subject responses across a data set to recreate the latent answer key for a group (Batchelder & Romney, 1988, 1989). Answer keys were computed for each group separately and for groups merged to form larger samples: (a) all five groups combined, (b) the three Vietnamese speaking groups combined, and (c) the two monolingual Vietnamese speaking groups combined. The answer keys were tested for agreement using an ordinal measure of association, Goodman and Kruskal's gamma ( $\gamma$ ). A pair of answer key values were considered concordant when they were exactly the same, and discordant otherwise. Resulting gamma values for pairwise comparisons of all groups are shown in Table 3.

In general, the three Vietnamese-speaking groups gave extremely similar responses during the triad task (gammas ranging from .974 to .998). Gamma values were perfect (1.0) for the monolingual Vietnamese (United States) compared to all three Vietnamese-speaking groups combined and for the monolingual Vietnamese (Saigon) compared to the merged monolingual Vietnamese speakers (United States and Saigon). The monolingual Vietnamese speakers in the United States overlapped experience with the other two groups. The Vietnamese in Saigon were closest to Vietnamese culture and language. This suggests that the keys resulting from the merged groups most resembled those of the groups with greater expertise.

A third perfect (1.0) gamma score occurs for the bilingual Vietnamese responding in Vietnamese compared against the answer key for all five groups combined. Again, the bilingual Vietnamese speakers may have emerged as most expert because they overlapped experience with both languages and cultures. Furthermore, in a combined group, subtleties do not determine consensus because they are specific to a minority of the individuals responding. Bilinguals agreed most when responding in Vietnamese, not English, because three Vietnamese-speaking groups were included in the merged group of all participants but only two English-speaking groups. Agreement of the bilingual speakers with the combined key was also inflated because the bilingual individuals were represented twice in the combined group, once speaking English and once speaking Vietnamese. Although their responses in the two languages varied considerably (agreement is .657 and their MDS plots are different), their individual differences are repeated.

Bilingual speakers responding in English showed much lower agreement, both with the individual monolingual Vietnamese groups and the monolingual English group, ranging from .641 (Vietnamese in Saigon) to .773 (monolingual English). This result is similar to our study of color naming in English and Vietnamese (Alvarado & Jameson, 2002). Our bilingual participants were drawn from a student population practicing English regularly but not immersed in Vietnamese immigrant culture, as were the monolingual speakers. Results may be different for bilingual participants regularly using both languages.

Even the lowest gamma value in Table 2 represents considerable agreement among participants across languages compared to chance ( $\gamma = .33$ ). Monolingual Vietnamese groups in this study produced gamma values of .842 and .813 showing strong agreement with monolingual English speakers, suggesting that they routinely made closely similar judgments about the terms even though responding in two different languages. This level of agreement cannot happen unless the meanings of the terms were closely similar across the two cultures.

## Discussion

Our findings for Vietnamese speakers replicate those of Moore, Romney, and colleagues for Chinese and Japanese participants (Moore et al., 1999; Romney et al., 1997). We believe our results support their contention that the semantic structure of emotion terms is (a) closely similar among the Asian language groups and (b) closely similar between the Asian language groups and English. As in their research, we too found important differences known to exist between cultures, identified via ethnographies and other methodologies. Thus, not only did a closely similar structure for the emotion lexicons emerge in our study, as in theirs, but culture-specific differences were found where they were to be expected.

The sensitivity of a methodology to difference is essential if it is to be used to study cultural influences on emotion knowledge, not simply universalities. Moore et al. (1999) found that Japanese participants evaluated shame as more pleasant than Chinese participants did. Like their Chinese participants, all three of our Vietnamese groups considered shame to be closest to fear. This suggests an understanding of shame consistent with the role played by shame in the Vietnamese and Chinese cultures and different than in Japanese culture, where shame is used in childrearing (Li, Wang, & Fischer, 2004). Moore et al. (1999) note that the Japanese language does not differentiate sharply between shame and embarrassment; both words were offered as translations for the word *hazukashii*.

Moore et al. (1999) examine the contribution of several sources of variability by partitioning the participant-by-participant intercorrelation matrix into within and between subsets. For our study, a comparison of the consensus analysis variability (SD) in Table 1 shows that (a) variability exists where expected among bilingual speakers and in groups with heterogeneity due to dialects or differing age and experience and (b) despite such sources of variability the extent of

consensus within the language groups is closely similar, even comparing English and Vietnamese speakers.

Moore et al. (1999) note the importance of holding the stimuli constant while comparing the structure of emotion terms (i.e., the pattern of relationships among the stimuli) and measuring the intra- and intercultural variability across groups. The structure is specific to the list of terms chosen as stimuli, which suggests the importance of choosing the right stimuli for a study. In fact, some cultural relativists have stressed difficulties of translation, even suggesting they may be insurmountable barriers to cross-cultural research on emotion. Our findings contradict this, suggesting instead that the respective positions of items within the emotion meaning space may be robust despite difficulties of translation. Moore et al. (1999) state:

It is an empirical question as to how different the structure would be if we made “mistakes” in the selection or translation of terms. For example, would it make any difference if we had used the term *glad* rather than the term *happy* in the English version of the test? (p. 541)

Our translation of *happy* might back-translate to “joy” but produced no disparity between the positions of the items in the English and Vietnamese plots. Similarly, our translation of *excitement* contained a modifier denoting pleasure but occupied the same respective position as the English equivalent without such a modifier. On the other hand, our Vietnamese equivalent to *anguish* also means “miserable” and scaled closer to “sad” than the English word that had higher arousal. Thus, the accuracy of translation can be assessed using the positions of items in the resulting plots, providing an empirical method for verifying the accuracy of translated terms.

Our results confirm a difference in the emphasis of the arousal dimension previously noted by Tsai, Knutson, and Fung (2006), with a deflection of “anxious” toward “excitement” in the English plot but not in the Vietnamese plots. This hints at intriguing cultural differences beyond translation, with several possible explanations. English and Vietnamese may conceptualize anxiety differently. English speakers may more strongly differentiate between discrete emotions (fear, anger, and happiness) and mood states (calmness, depression, and anxiety) or arousal states (relaxed, tense, and nervous). An exploration of the structure of the Vietnamese lexicon would clarify this (Ortony et al., 1988). Alternatively, the inclusion of “anxious” with low activation negative terms may reflect a tendency to confound bodily response with emotion in English but not Vietnamese. Pavlenko (2008; Pavlenko & Driagina, 2007) suggests that some languages confound the physiological and psychological, whereas others encode them using distinct terms. Ethnographers have noted a greater tendency for Chinese speakers to use bodily terms to discuss emotional states and less tendency to evaluate emotion in terms of arousal (because other words encode that feeling). This de-emphasis of the dimension of arousal is most obvious in South Pacific languages where no separate dimension of arousal has been found (Russell et al., 1989). A dimension of arousal exists in both English and Vietnamese, but there may be a difference in emphasis. This methodology would be well suited to manipulating the arousal dimension in a scaling task like that of Athanasopoulos (2007) and Cook, Bassetti, Kasai, Sasaki, and Takahashi (2006), who studied categorization of count nouns versus mass nouns.

English basic emotion terms consist of single words (monolexemes). Even subordinate terms in English tend to be monolexemes. As we found for color naming, Vietnamese does not use many monolexemes but relies more heavily on terms with modifiers. Romney and Moore’s studies of Japanese and Chinese avoided this issue by presenting ideographic characters instead of phonetic alphabetic translations. Their Chinese emotion terms were all two-character pairs. Furthermore, Chinese characters are frequently composites of other characters whose meanings combine to form a new, potentially more complex concept. An insistence on monolexemic basic

naming would force the conclusion that Vietnamese has only five basic emotion terms: *buon* (sad), *vui* (happy), *so* (fear), *ghet* (hate), and *yeu* (love). This idea ignores the structure of the Vietnamese language and imposes English naming patterns on Vietnamese culture, an ethnocentric practice that has been criticized in the literature (Dewaele & Pavlenko, 2002; Pavlenko, 2008; Wierzbicka, 1999).

### *Application of the IDM to Emotion*

To apply the IDM to characterize the emotion meaning space, we first assume that emotion terms are names for emotional experiences which are their referents and that the domain of subjective emotional experiences exists separately from the lexicon of terms used to communicate about those experiences. Naming is the flexible assignment of available terms to regions of the emotion space. This assignment is flexible. Like Pavlenko (2008), Putnam (1988), and others, we believe “words do not have immutable meanings or stable affective dimensions—rather their meanings and affective connotations are internalized, constructed, and negotiated in context” (Putnam, 1988, p. 147). The IDM model (Jameson & Alvarado, 2003) describes this assignment and includes the following axioms: (a) in addition to category structure and lexical content, assignment of names depends upon both the number of names available and the extent of the stimulus space to be named; (b) names will be assigned to items in order to maximize their information content; (c) best exemplars of names will be located at points that equalize the distances between them with each new point maximally distant from existing points; (d) when the number of names available increases over time, the location of the first names applied to a space will partially determine the location of subsequent names; (e) confidence judgments depend on the mappings produced by this naming process (which we call the naming function), not the salience of items nor their inherent characteristics; and (f) changing the extent of the stimulus space or the number of names available will change the locations of focal exemplars and category boundaries.

The IDM model predicts a polarity along the first main dimension with similar polarities subdividing the remaining areas, predicting the positions of the centroids within subcategories and defining the subdimensions occurring after the first split. The dimensions emerging following the first split depend on the sampling of items, with the second split occurring along the most salient dimension of difference remaining after the first split (Garner, 1976; Nosofsky, 1986, 1992). Saliency is an emergent property of the context in which naming occurs, not simply the features of the stimuli.

Our results are consistent with the IDM axioms. In our study and all previous scaling studies of basic emotion terms, the first split is between the positive and the negative terms (pleasantness or evaluation). The second split is typically between anger/fear/disgust and sadness, along the second dimension (generally but not always arousal or activation). A subsequent third split occurs between anger and fear, the two higher arousal negative emotions, most likely along a dimension of potency or control. The locations of the emergent centroids for sadness, anger, and fear occur equally distant from each other and the happiness terms within the remaining unoccupied space. When surprise or neutral items are included, this results in the appearance of a circumplex. Synonyms and contextualized variants of these terms cluster around the centroids (not basic terms) in each region of the meaning space. If these clusters were each presented separately, as the sole stimuli, new dimensions of meaning would emerge with the need to differentiate among them. For example, a cluster of positive emotion terms produces a dimension of internal versus external application (transitivity, as discussed for Russian by Pavlenko, 2008; Pavlenko & Driagina, 2007). Some positive terms describe one’s internal state (happiness, joy, and peace), whereas others describe an attitude or feeling toward another person (love, fondness,

and affection) (Alvarado, 1998). Other dimensions emerge in other contexts (De Rivera & Grinkis, 1986; Ellsworth, 1994, p. 36; C. Smith & Ellsworth, 1985).

The IDM considers the process of naming, and the structure of the emergent lexicon, to be dynamic within the context of several sources of influence, including social demands, the need to communicate effectively, and immediate pragmatic concerns (Putnam, 1988). Thus, the IDM might be used to study pragmatics by exploring inconsistencies in naming within the same individual arising in different naming contexts (as occurred for bilinguals in this study). Because competence scores are normally distributed, inferential statistics (ANOVA, *t* tests) can be applied to test observed differences, permitting hypothesis testing for theories of cultural difference. A researcher who can specify proposed influences upon naming, such as differences in the emphasis placed by a culture on shame versus guilt, can also predict the location of such terms in scaling studies, as a test of theories of social or psychological construction of emotion.

### *Impact of Bilingualism*

Our comparison of bilingual Vietnamese participants in English versus Vietnamese tests individual responses across two naming contexts. Our findings suggest that bilinguals produce flexible, meaning-based judgments consistent with the culture of the language in which they are asked to perform the task. Unlike most previous studies of bilingualism, we included a within-subject comparison in which the same bilingual participants responded in two languages. This within-subject approach makes the shift in naming more obvious and eliminates the possibility that individual differences in acculturation, extroversion, or gender might account for the difference in naming across the two language contexts (Athansopoulos, 2007).

We observed a type of code-switching among bilinguals, not a simple transition from L1 to L2 via the acquisition of culture-specific concepts due to increasing language competence (Athanasopoulos, 2007). Bilingual Vietnamese responding in English treated *shame* similarly to native English speakers, whereas the same participants responding in Vietnamese treated *shame* similarly to monolingual Vietnamese speakers. Compared to native speakers, the bilingual speakers were less competent in either language, but their use of meaning was consistent with the culture of the language they were speaking, not the dominant culture in which they were living their current lives (Western, English-speaking university culture). Others have observed a similar phenomenon. Perunovic, Heller, and Rafaeli (2007) observed that East-Asian Canadian biculturals shifted their affective pattern as they changed their language to communicate with members of one or the other cultural group, adopting a “culturally congruent phenomenology, including a distinct affective pattern” (p. 607). Pavlenko and Driagina (2007) also found that English-speaking bilinguals followed a Russian pattern of intransitive verb use when speaking in Russian but switched to an adjectival pattern in English.

Code switching seemed to occur for meaning when meaning differed across languages (e.g., for the word *shame*). However, where the meanings did not differ, participants applied the grammar of their new language (English), even when responding in Vietnamese. Thus, code switching seems to be driven by meaning, not by variables of language acquisition. In our previous study of bilingual Vietnamese color naming, bilingual speakers acquiring English imposed some of the usage and structure of English grammar onto their responses in Vietnamese (Alvarado & Jameson, 2002, 2005). Meaning and language structure interact in naming behavior. Pavlenko (2008) reviews a number of studies in which emotion names are treated differently than concrete and abstract nouns. Our study supports Pavlenko’s (2008) contention that different languages have different distributions of types of emotion words (e.g., different frequencies of nouns, adjectives, pseudo-participles, adverbs, and transitive versus intransitive verbs) varying with a culture’s

beliefs and attitudes about emotion. Methodologically, the discrepancy between the two solutions produced by the same individuals speaking two languages clearly illustrates the impact of pragmatic concerns on lexical choice.

It has been argued that immigrant monolingual speakers in the United States are not a suitable population for cross-cultural investigations. The close similarity between the responses of the bilingual participants, the monolingual Vietnamese in the United States, and the monolingual Vietnamese in Saigon suggests that the groups responding in the United States are a close proxy for their counterparts in Vietnam. Cultural contamination cannot be presumed to invalidate every investigation. Our findings suggest that immigrant groups can be studied to investigate cross-cultural differences in this kind of task. It might also be argued that the availability of Western media may have changed the Vietnamese lexicon, resulting in the close similarity of results among the studies described here. If so, it is unclear why the differences noted in the plots for contextualized terms such as *shame*, which parallel the differences observed between the cultures themselves, are not similarly wiped out by exposure to the media, especially among bilinguals in the United States. It is not plausible that the distinction between shame is the strongest difference between Vietnam and the United States and thus resistant to media pressures. We propose instead that similarities and differences in the emotion lexicon are not eliminated by media influences, perhaps because everyday social interaction and communication have a greater impact on language than passive media exposure.

## Conclusion

In past decades, generalizations based on similarity have been challenged by evidence of disconfirming differences in a tug of war between theorists loosely characterized as universalists and cultural relativists (cf., the debate between Ekman, 1992, and critics such as Ortony & Turner, 1990, or Russell, 1991 [AQ: 1]). Cross-cultural studies are characterized by both similarities and differences. Our challenge is how to incorporate both into useful theoretical models of emotional experience and behavior. Moore et al. (1999) conclude that their finding of strong similarity in the lexicons across three language groups support theories of the universality of basic emotion. We used a similar methodology to identify culture-specific differences that we believe enrich our understanding of the construction of emotional meaning when cultures vary. If cultural differences are to be more than disconfirming evidence to confront overgeneralizations, a method is needed for using difference to modify theory. More detailed models that propose mechanisms for the construction of emotional meaning are needed. Such models must be predictive, not simply descriptive, and capable of producing testable hypotheses.

Although there no doubt exist commonalities in emotional response based on physiology shared by humanity (Izard, 2007) and no doubt also exist commonalities in emotional response attributable to the shared human condition, shared solutions to problems of living, and social organization, we believe there are additional contributors to similarity. We propose that similarities in the emotion space emerge because of the nature of cognition and language, because of the operation of cognitive naming processes applied to a meaning space. Specifically, when a single superordinate category for emotion exists, the optimal number of subdivisions of that meaning space into subcategories is limited by working memory, thus the emergence of clusters of terms. When a language contains a set of abstract, decontextualized emotion terms (e.g., fear, anger, happiness), these will show greater consensus of judgment about meaning both within and across cultures than more contextualized terms (e.g., envy, shame), which will show greater cross-cultural differences in meaning. The balance between basic and contextualized terms in a stimulus set will thus change the amount of consensus attributable to culture and other sources of shared knowledge. This idea can be readily tested by manipulating the characteristics of the stimulus set.

Moore et al. (1999) assert that individual differences outweigh cultural differences and thus are more important as a source of variability in studies of the emotion lexicon. As theorized by Jameson (2005a, 2005b, 2005c; Sayim, Jameson, Alvarado, & Szeszel, 2005), one function of language is to regularize wide individual differences in subjective experience and permit meaningful communication despite differences arising from biology. Existence of emotion terms may permit those with widely varying subjective states and personal experiences to communicate clearly in service of social and self-regulation of both affect and behavior. Thus, it may be more important that people understand what is communicated by the terms used than that everyone feel the same way when using a particular term. Variance attributed to individual differences may arise from such sources as individual differences in the experience of emotion, in subjective awareness, or in other important personality factors affecting emotional response, but it may also arise from differences in the ability to communicate using emotional language. This too is testable using our methodology. Emotion language may gloss large underlying differences in emotional response as effectively as color language masks the varying perceptual experiences of color blind individuals living among normal trichromats (Sayim et al., 2005).

If so, the close similarities found by Moore et al. (1999) may not reflect universalities of emotional response but instead may reflect the limited number of possible solutions for a naming system that must regularize complex understandings across a shared meaning space. When understanding is paramount and misunderstanding is undesirable, dependence on nuance will not be a strong feature of a naming system. Under such circumstances, meaning should be relatively impervious to imperfect translation, use of synonyms or multiple-word constructions as opposed to monolexemes, and the various other differences cataloged by cultural relativists as obstacles to understanding. Consistent with our hypothesis, these sources of “fatal miscommunication” were found to have little impact on the results in our study.

Most of us cannot think in more than two or three dimensions simultaneously. Most of us have difficulty noticing more than what is salient in a given context, especially when we are distracted or must respond quickly. Formation of iconic exemplars (e.g., prototypes) or composites of multiple features across dimensions aids quick response. If we have readily available concepts representing complex emotional states, it implies that previous cognitive demands have made such constructs useful. We learn them through experience stimulated by the desire to communicate, a desire shared by otherwise diverse Asian and Western cultures. We argue that once a superordinate category for emotion is formed, cognitive constraints determine the structure of the resulting domain of terms. While emotional experiences may vary, the cognitive processes that constrain our ability to think operate to ensure effective communication across a broad palette of differences in both internal and external experience, resulting in the uniformities observed in studies such as ours, and those of Romney, Moore, and colleagues.

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