Comparing Eastern and Western Emotion Representation through the lens of Lexical Elaboration

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Abstract

Are emotions universal, and are they experienced similarly across cultures? While many argue that this is the case, some studies suggest that significant differences may lie between Eastern and Western cultures in particular. In this study, we apply the framework of lexical elaboration to further investigate this claim. Specifically, we focus on differences in communicative need - both for emotions as a broad semantic category, and for emotions as a continuous spectrum of concepts defined by their valence. Utilising a large set of bilingual dictionary data to empirically test our hypotheses, we find that despite differences in the relative sizes of their emotion lexicons, Eastern and Western languages encode emotions according to valence in remarkably similar ways. Although these results point to a universalist perspective on emotion representation, the limited generalisability of our findings is also discussed.

Since Charles Darwin's 1872 work *The Expression of Emotion in Man and Animals*, many have aimed to investigate the universality of emotion representation on the basis of social, cognitive and biological foundations. Amongst these studies lie well supported theories that point to at least some aspects of emotion remaining constant across cultures. For example, the question of whether different cultures experience the same types of emotion has more or less been settled by studies that demonstrate universal trends in emotion classification, both on a visual (Ekman, Sorensen & Friesen, 1969) and linguistic (Frijda et al., 1995; Hupka, Lenton & Hutchinson, 1999) basis. Similarly, studies that investigate the question of how different cultures structure emotion categories in relation to one another also lean heavily in favour of the universalist perspective - spatial models such as the Circumplex Model of Affect (Russell, 1980) are said to be shared amongst European, North American and Asian cultures (Russell, Lewicka & Niit, 1989; Yik & Russell, 2003), and similar models that map emotion across universal domains of valence, arousal and dominance have since followed (Power, 2011).

While these findings may help justify broad generalisations about the overall variety and structure of emotion categories within cultures, they fail to address the question of whether cultures differ in the degree to which they emphasise emotions and emotion categories. For example, a study by Semin et al. (2002) found that Dutch participants could list significantly more emotion words than their Surinamese counterparts in a set time frame, suggesting that that there are differences between the two cultures in their relative emphasis of emotions as an overall category. At a more specific level of granularity, studies by Schimmack et al. (2002) and Uchida et al. (2002) have found significant differences between Eastern and Western cultures in the way that individuals perceive, experience and recall positive and negative emotions, suggesting that differences in emotional emphasis on the basis of valence also exist. These studies fundamentally challenge the notion that emotion representation is universal across cultures and are firmly rooted in the idea that such differences are based on deep cultural differences (Markus & Kitayama, 1991). These are often framed as a contrast between either individualism and collectivism (Semin et al., 2002), or, somewhat analogously, Eastern and Western philosophies (Schimmack et al., 2002; Lim, 2016).

One way in which cultures can be compared in specific domains is through the framework of lexical elaboration. The basic premise of this is that environmental factors shape local communicative needs, which in turn shape the individual category systems of languages (Rieger, Carstensen & Kemp 2016). Specifically, the category systems that a culture interacts with more often, for example the category system of 'snow' within Eskimo cultures, will translate into richer and oftentimes larger lexicons within that category. If this causal chain is to be taken as true, then the reverse should also be true – that the relative richness and size of local languages in specific semantic categories should at least be partially indicative of the local communicative needs of its speakers. Using this line of reasoning, we

can apply lexical elaboration to investigate how the emotion lexicons of Eastern and Western languages might reveal differences in communicative needs for emotions and emotion categories, and thus differences in emotional emphasis. The benefits of this approach are twofold: first, it addresses past concerns that comparing emotion variety and structure provides little information about emphasis and frequency of experience (Mesquita et al., 1997), and second, it provides a large scale, data driven methodology to investigate a domain where prior studies have often leaned towards being anecdotal.

The aim of this study is to expand on past work that has focused on comparing emotion representation in Eastern and Western cultures by investigating two central questions. First, we want to look at whether Eastern and Western cultures have different levels of communicative need about emotions as an overall category. Using our framework, this would translate to differences in the size of a language's emotion lexicon relative to its overall lexicon. Based on the findings of Semin et al. (2002), we hypothesise that such a difference will exist, although we make no predictions about the direction of the difference. Our second question relates to how communicative need about specific emotion categories according to valence might differ between East and West. This echoes past studies that have suggested that emotional valence is perceived and experienced differently between the two regions (Bagozzi et al., 1999). Based on findings that positive and negative emotions are viewed as compatible rather than oppositional amongst Eastern cultures (Schimmack et al., 2002), we hypothesise that Eastern languages will have more emotion words that occupy the middle-ground of neutrally valanced terms, while Western languages will tend to be bimodal in their valence distributions, with emotion words tending to be either negative or positive.

Method

To test our hypothesis, we selected a set of 29 languages as our sample of Eastern and Western languages. Of these languages, 16 originated from the 'East' and 13 from the 'West'. These languages were chosen on the basis of the availability and completeness of their dictionary datasets. For convenience, our definitions of East and West are largely geographical – Eastern languages originate from East, South-East and South Asia, while Western languages originate from Western Europe.

Our main dataset was a collection of 518 English bilingual dictionaries that covered each of our 29 languages. For every English word, these dictionaries provided frequency counts for the approximate number of equivalent words in its second language. Languages for which we had multiple sets of dictionaries used averaged frequency data for better accuracy. Our second dataset was the NRC VAD dataset (Mohammad, 2018), which provided valence scores ranging from zero to one for some 20,000 English words. Scores of zero corresponded to words extremely negative in valence, and scores of one corresponded to words extremely positive in valence. Each of our emotion words was matched with its

corresponding valence score. Our final dataset was a collection of word stems for emotion related words sourced from Scherer (2005). These word stems formed the basis of the 63 emotion nouns that we used within our study as our set of emotion words.

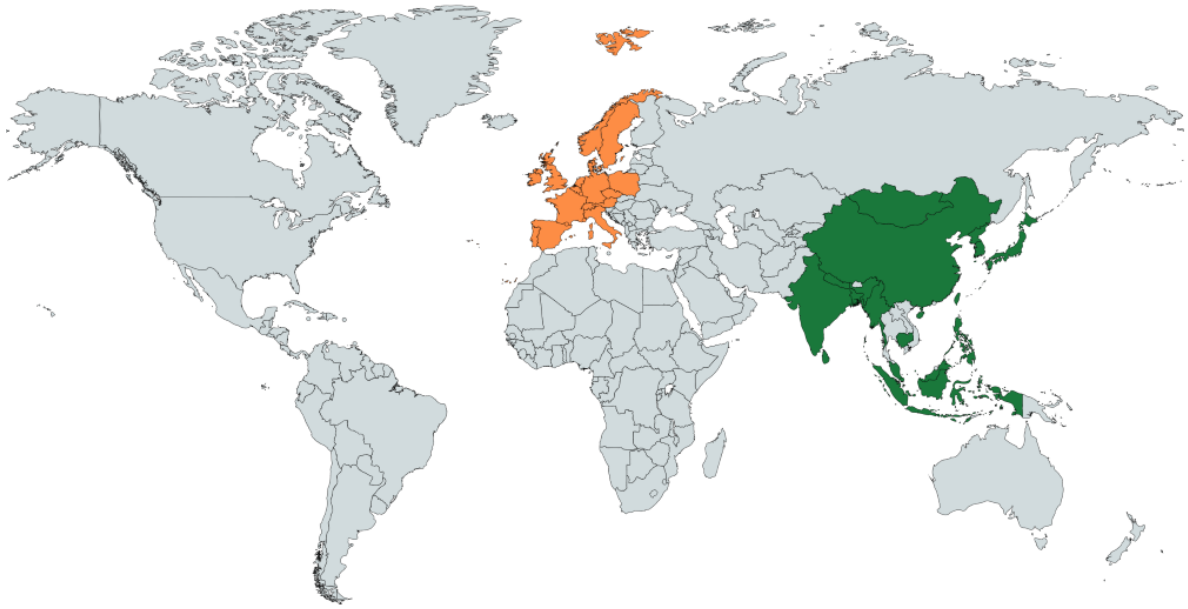

Figure 1. 29 languages were chosen for this study - 16 Eastern (green) and 13 Western (orange)

Analysis

Emotion word proportions for each language were calculated as the sum of emotion word frequencies divided by the total sum of word frequencies. To investigate differences between East and West, we ran a generalised mixed effects regression analysis. Language family was included as a random effect to account for similarities between genetically related languages. The analysis was thus run according to the following formula:

$$Proportion \sim Region + (1|LanguageFamily)$$

Emotion word valence distributions for each language were formed by ordering our set of emotion words by valence, and then forming probability density distributions for each language using their emotion word frequency counts. To investigate differences between Eastern and Western distributions, we took a Bayesian approach and ran a quantile regression analysis. Again, language family was included as a random effect to account for genetic similarities. The analysis was thus run according to the following formula:

$$Valence_{quantile} \sim Region + (1|LanguageFamily)$$

Because of constraints in time and compute, we only ran our quantile regression analysis on the first, second and third quartiles of the density distributions. These calculations were also not run to completion, and as such their results should only be taken as tentative indications of the trends that we would expect to find should they be run to completion.

Results

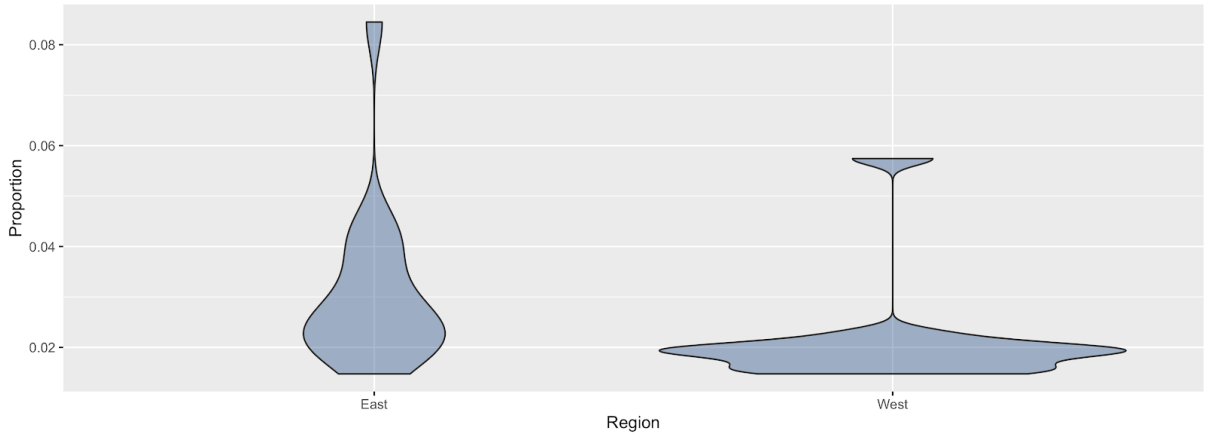

Figure 2. Violin plot depicting distributions of Eastern and Western emotion lexicon proportions

Results from the mixed effects regression analysis suggest that language region has a significant effect on the proportion of emotion words in a lexicon ($X^2(1)=1063.5$, $p<0.001$). These results indicate that Western languages tend to have relatively smaller emotion lexicons compared to Eastern languages.

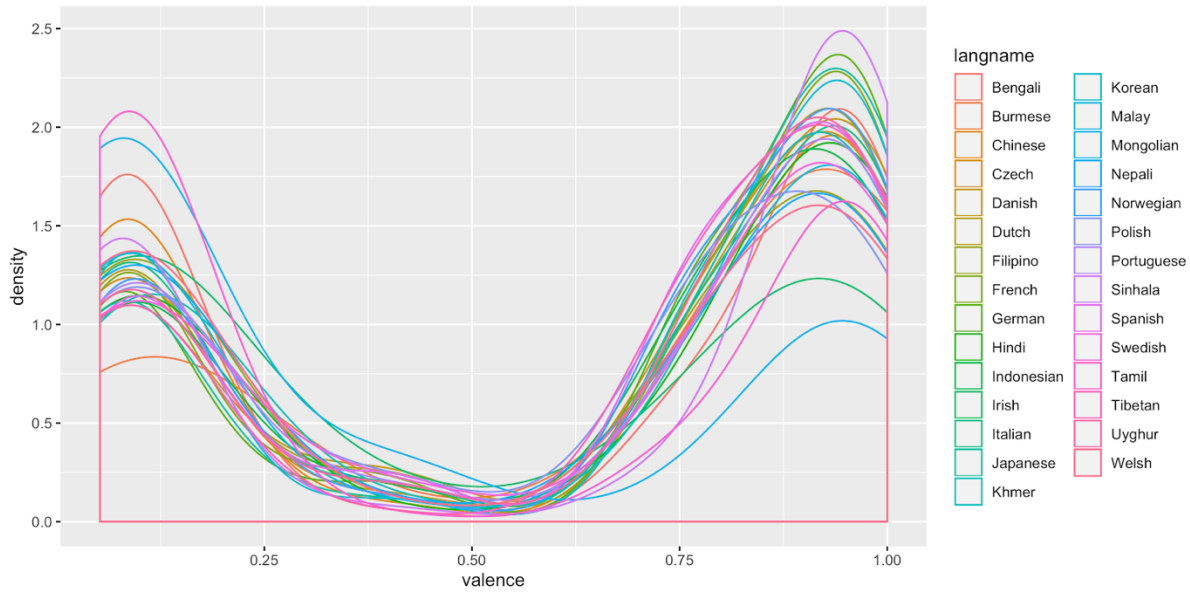

Figure 3. Density distributions of emotion word frequencies for each language on the basis of valence

Results from the quantile regression analysis reveal little difference between the valence-frequency distributions of Eastern and Western lexicons. The Western coefficient posterior is centred at around 0.091 for the first quartile, -0.055 for the second quartile, and 0 for the third quartile. At each quartile this indicates that the differences between East and West in terms of their valence-frequency distributions are minimal.

Discussion

The hypothesis that Eastern and Western languages would differ in the relative sizes of their emotion lexicons was supported, with emotion lexicons tending to form a larger proportion of the overall lexicon in Eastern languages compared to Western languages. This finding points to Eastern cultures having a greater communicative need for emotions as a whole, and reflects a sense of greater cultural emphasis (Averill, Chon & Hahn, 2001). Interestingly, this direction of difference is opposite to that found by Semin et al. (2002), whose own findings would suggest that it is individualist rather than collectivist cultures that place greater emphasis upon emotions. One possible explanation for this is the difference in study designs – while Semin asked participants to list as many emotion words as possible, our study was based purely upon the lexicons of a language as encoded by bilingual English dictionaries. With this distinction in mind, it is possible that the two results do not necessarily contradict one another at all - for example, one explanation for the difference could be that the Semin et al. study design reflects differences in emotional emphasis in the context of interacting with strangers, an area that is also moderated by cultural norms and display rules (Safda et al., 2009), while our study design reflects broader trends in emotional emphasis that are naturally embedded in both the written and spoken language.

The hypothesis that Eastern and Western languages would differ in their valence-frequency distributions was not supported. To the contrary, these distributions were strikingly similar, adding weight to past studies that have proposed universal qualities in how emotions are structured according to valence (Russell, 1983). In the context of emotional emphasis, this result suggests that Eastern and Western cultures view the relative relationships between positive and negative emotions in a similar way, and that there are no differences between their emphasis on emotions on the basis of valence. Given the abundance of past studies that have specifically investigated differences between how Eastern and Western cultures perceive positive and negative emotions in relation to one another (Schimmack, Oishi & Diener, 2002; Uchida & Kitayama, 2009), this result seems counterintuitive – yet, again there is no necessary contradiction, as the relationships between emotional valence that past studies describe are rooted in individual experiences as opposed to dictionary lexicons. While the former may have an impact on the latter, the causality between the two is not certain. In a way, these differences instead lie in support of a more general hypothesis that emotion is inherently universal, but its expression is moderated by the context of local cultural norms and display rules (Solomon, 1995).

While dictionary-based studies have been applied successfully in other domains, their use in the investigation of emotion representation has been controversial. In particular, some criticize the assumption that emotion words maintain translational equivalence across languages (Altarriba, Basnight & Canary, 2003). To a certain extent this issue is moderated within our study through the use of English as a meta-language, but this has its own problems – by doing so, our methodology potentially fails to account for untranslatable emotion words in other languages. Moreover, our study also relies on the assumption that valence scores remain equivalent across translations. This is not necessarily true, and it is therefore possible that our findings instead only reveal how English emotion words remain constant across cultures on the basis of English valence scores. While this calls into question the generalisability of our study, these criticisms regarding translatability are so far unsubstantiated, and contradict the fundamental assumption of accurate translational equivalence that all bilingual dictionaries rest upon. Nevertheless, future studies should take care to consider these potential shortcomings, and investigate in greater detail how valence scores and emotion words might maintain their consistency across translations.

Our study provides evidence that while Eastern cultures tend to have greater communicative need for emotions overall, both Eastern and Western languages have similar communicative needs about emotions on the basis of valence. This finding stands in support of the common theory that emotion representation exhibits universal structural qualities, but ultimately says little about how emotional expression differs at an individual level. Future studies could make use of new data sources that more effectively capture trends in emotion representation at the level of the individual in order to investigate this domain.

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