🗨 **LETTER**

Claims of categorical primacy for musical affect are confounded by using language as a measure

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Cowen et al. (1) leverage modern gains in data science to describe impressive cross-cultural similarities in the perception of musical affect and do so in unprecedented detail. Their approach is innovative and fundamentally empirical. As such, it should have important applications for prediction in the field of affective computing, which aims to create artificial systems that can recognize and simulate human affect (2). At a theoretical level, however, the authors argue that their results support the primacy of categories in how music makes us feel, posing broad dimensions like valence (3) and arousal (4, 5) as post hoc derivations. If true, these claims would have broad implications for understanding the structure of emotional experience, in music and beyond.

The relevant analysis compares American and Chinese ratings of musical affect as a function of categorical vs. dimensional response modes—that is, word lists (e.g., "joyful," "sad," etc.) vs. rating scales (e.g., "pleasant?," "stimulated?," etc.). The results show that categorical ratings are more strongly correlated across cultures than dimensional ratings (figure 1A in ref. 1), and that categorical ratings are a better basis for predicting responses across cultures (figure 1B in ref. 1). Concluding that these results reflect the primacy of categories in emotional experience is confounded by at least two problems.

The first is the inherent assumption that emotional words (like "joyful") map directly onto the contents of emotional experience. Although the mechanistic bases of language and subjectivity remain obscure, experience teaches us that words often fail to express how we feel. Accordingly, we routinely omit, add to, and/or misrepresent the elements of an emotional experience in linguistic description (6). Conclusions about the structure of emotion based solely on analyses of words selected to represent them in rating tasks are therefore dubious.

The second problem is that the language we use to describe emotion is categorically biased (7). Sharing feelings is an essential feature of human social life, and whether interacting face to face, by voice, or via text, this sharing relies heavily on word-based semantic categories, like happy (gāoxìng) and sad (nánguò) (8, 9). This works reasonably well because socialization trains category boundaries to be consistent across individuals (10). The critical point regarding Cowen et al. (1) is that no comparable training takes place for dimensional assessments of emotion, which are, on the whole, extremely uncommon in social communication. Few would say, for example, that they feel very unpleasant, highly stimulated, and low in dominance to describe being anxious. Participants can thus be expected to have relatively little experience interpreting affect dimensionally and virtually no training to do so consistently. This implies that categorical ratings of affect are more consistent, not because feelings are categorically structured, but because communication about feelings trains consistency in their application.

In sum, Cowen et al.'s (1) innovative approach to musical affect documents cross-cultural similarities in unprecedented detail and has important practical value. However, claims of categorical primacy in human emotional experience seem better applied to the structure of the language we use to communicate about emotion, rather than to emotion itself.

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