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# Disentangling Three Valence-Related Dimensions of Emotion Valuation: The Good, the Pleasant, and the Desirable

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People place value on emotion categories that inform which emotions to cultivate and which to regulate in life. Here, we examined how people's beliefs about emotion categories varied along three valence-related dimensions: evaluation (good, bad), hedonic feeling (pleasure, displeasure), and desirability (want to feel, do not want to feel). In Studies 1A and 1B, we found that evaluative (good/bad) and hedonic (pleasant/unpleasant) ratings were distinct for certain emotions including lust, anger, shame, fear, and guilt. In Study 2, we found that emotion valuation depended on cultural background in a sample of Asian Americans and Caucasian Americans. Overall, Asian American participants evaluated certain emotions (including, but not limited to, anger, sadness, guilt, and shame) more positively than Caucasian American participants, and this difference was more pronounced on the evaluative rating dimension. Finally, in Study 3, we examined how evaluative and hedonic dimensions further relate with the desire to experience certain emotions and the emotions that people believe they feel in everyday life. Our findings support a model in which evaluative and hedonic dimensions of emotion valuation predict desired emotional states, which in turn predicts beliefs about the reported frequency of emotions experienced in everyday life.

*Keywords:* emotion, valuation, ideal affect, emotion knowledge, culture

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> You now become easy victims of lust, anger, malice, envy, and the rest of that evil brood; the atmosphere of the heart is polluted by the ego (Atharva Veda, Hindu Scripture)
>
> God opposes the proud but shows favor to the humble (James 4:6)
>
> Fear is the path to the dark side (Yoda).

From philosophical and religious scriptures to lessons from pop cultural icons, examples of how people place value judgments on emotion categories are abundant. Such values may guide which emotions an individual cultivates (Briggs, 1970; Oatley, 2004; Parrott, 1993; Tomkins, 1962, 1963; Tsai et al., 2013), shape how an emotion is experienced and expressed (Averill, 1983; Ellsworth, 1994; Emmons, 2005; Ford et al., 2014; Mesquita et al., 1997; Solomon, 2008; Stearns & Stearns, 1989), and influence when and how to initiate emotion regulation (Becerra et al., 2020; Fischer et al., 2004; Harmon-Jones et al., 2011; Hochschild, 1979; Larsen, 2000; Tamir, 2016; Tice & Bratslavsky, 2000). How people value emotion categories also moderate the relationship between negative affect with health and well-being (Miyamoto et al., 2014; Willroth et al., 2023). For instance, people who more positively value negative affect states show a reduced link between experiencing negative

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affect and poorer physical health (Luong et al., 2016; also see Mauss et al., 2011).

Despite its importance, much remains to be known about how people value and judge discrete emotions. Prior work on emotion valuation has tended to focus on affect valuation (i.e., the valuation of high- vs. low-arousal emotional states or positive vs. negative valence states; e.g., Luong et al., 2016; Tsai, 2007). Other work has examined a handful of specific discrete emotion states and their role in particular contexts (e.g., Harmon-Jones et al., 2011; Koopmann-Holm et al., 2013; Netzer et al., 2015; Tamir et al., 2008). However, few studies have examined how people value a broader variety of discrete emotion categories along multiple, potential distinct valuation dimensions. The goal of the present work is to examine how judgments about emotion categories vary along three different valence-related valuation dimensions (Colombetti, 2005; Walle & Dukes, 2023)—pleasure, goodness, and desirability. We refer to all three dimensions as "valence-related" since the term valence has been used by researchers to refer to these dimensions (Walle & Dukes, 2023).

Perhaps the most prevalent valence-related dimension for emotion valuation is the hedonic dimension or the degree to which people believe that it is pleasant or unpleasant to feel certain emotions (Prinz, 2004; Russell, 1980; Yik et al., 1999). For example, Harmon-Jones et al. (2011) measured how much people "like the feeling" of the emotion categories such as anger, joy, sadness, disgust, and fear. Another valence-related dimension is desiring or wanting to feel certain emotions (also known as the ideal affect; Barrett, 1996; Izard, 1971; Kitayama et al., 2000; Rusting & Larsen, 1995; Tsai et al. (2007)). A third and perhaps most overlooked dimension is the evaluation of an emotion with an underlying virtuous tone, that is, for its goodness or badness Tangney et al. (2007). For example, Western philosophers, even before the Stoic philosopher Seneca, viewed anger as a bestial passion that should be eradicated from the mind (Potegal & Novaco, 2010; Solomon, 2008). Eastern Buddhist and Hindu philosophical and religious scripture also viewed anger as a moral blemish (Potegal & Novaco, 2010). On the positive valence end, lust, too, has been evaluated as a nonvirtuous emotion (Regnerus, 2007), while at the same time it may be considered hedonically pleasant (e.g., Kassam et al., 2013) and something a person may want and desire to feel. Recently, it has been shown that the negative evaluation of emotion categories may also be associated with psychological health (Willroth et al., 2023).

Importantly, all three valence-related dimensions of emotion valuation are also conceptually distinct from utilitarian or instrumental motives for emotion (Erber & Erber, 2000; Gruber et al., 2011; Hochschild, 1979; Parrott, 1993; Tamir, 2016; Tice & Bratslavsky, 2000), in which an emotion is valued for its usefulness in a more specific and limited context. Instrumental dimensions of emotion valuation are not considered to be intrinsically valence-related since even negative valence emotions can be more or less useful depending on the situation. People believe that anger or fear is a useful means to an end and choose to experience these emotions even though they are hedonically unpleasant (Tamir, 2009, 2016; Tamir et al., 2008). The instrumental value of an emotion is also conceptually distinct from the goodness of an emotion. For example, anger's situation-dependent functional utility has little bearing on philosophical and religious proscriptions of its negative evaluation. Similarly, lust may be viewed as having utility in promoting procreation (Fisher et al., 2002), but it is also considered a "bad" emotion according to some cultural institutions (Regnerus, 2007).

Despite theoretical contributions outlining different sources of value for emotions (Colombetti, 2005; Parrott, 1993; Tamir, 2016; Tsai, 2007; Walle & Dukes, 2023), there is relatively less empirical work examining people's evaluations of the goodness of specific emotions and how such evaluations relate with pleasant (hedonic) and desired (ideal or motivational) dimensions. Here, we conducted a set of survey studies to examine how people rate several emotion categories on these dimensions. For clarity in our usage of these terms, we refer to the pleasantness of an emotion as the "hedonic dimension," the goodness of an emotion as the "evaluative dimension," and the desire to feel an emotion as the desirability of an emotion. We further clarify our usage of the terms "evaluation" and "valuation." We use evaluation to refer to the evaluative goodness judgments (i.e., akin to focusing on the emotion as an attitude object), whereas we use the term valuation to refer to a valuation process in which multiple dimensions of value are integrated to inform the generation, regulation, and experience of emotion, which is consistent with the affect valuation framework (Tsai, 2007) and, as we discuss below, value-based decision-making models (Ochsner & Gross, 2014; Rangel et al., 2008) in general.

Since the evaluative dimension is often conflated with the hedonic dimension, Studies 1A and 1B provide an initial descriptive analysis of how participants in the United States differentially rate certain emotions and tested whether these dimensions in fact make distinct quantitative contributions to emotion valuation. We predicted that both mean differences, but also the correlation strength, would depend on the rating dimension and emotion category in question. In Study 2, we examined the role of Asian American and Caucasian American cultural background in the evaluation of emotion. Prior work suggests that culture plays a role in transmitting values and beliefs about emotion categories (Eid & Diener, 2001; Shaver et al., 1992; Solomon, 2008; Tsai et al., 2006). Correspondingly, we predicted that cultural background would differentially influence the evaluative and hedonic dimensions of emotion valuation.

Prior work by Tsai and colleagues has shown that hedonic and desirability dimensions predict people's beliefs about the frequency of discrete emotions they experience in everyday life (Tsai, 2007; Tsai et al., 2006). Based on these findings, in Study 3, we addressed two additional questions. First, we examined whether the evaluative dimension of emotion valuation is also distinct from whether someone desires or wants to feel an emotion, again predicting that the mean valuation and correlational dependencies would depend on the rating dimension and emotion category in question. Second, we examined how all three valence-related dimensions—evaluative, hedonic, and desirability—relate with people's beliefs about the emotions they feel in everyday life. We derived our hypotheses by integrating affect valuation theory with a value-based decision-making (VBDM) framework (Ochsner & Gross, 2014; Rangel et al., 2008; also see K. M. Lee et al., 2022). In VBDM, a decision between two or more options is determined based on an integration process of the values assigned to those options. For instance, when deciding whether to eat an apple or an orange, the VBDM framework posits that an integrative value is determined for each choice based on properties (e.g., taste, nutrition, texture) that are salient to the organism. As clarification, the term "decision" does not refer to making a conscious, deliberative decision. Rather, it refers to hypothetical neurocognitive processes that antecede the behavioral choice. Cognitive neuroscience models of VBDM suggest that value integration leads to an overall sense of subjective value that drives motivational desire and the observed

behavior (Rangel et al., 2008; Rolls & Grabenhorst, 2008). While the VBDM framework was primarily developed to explain behavioral actions, theory in affective science has also characterized which emotions people experience as the outcome of a choice process, too (Solomon, 1973). This theoretical synthesis of affect valuation theory with VBDM suggests that valuation dimensions including hedonic pleasure and evaluative goodness are integrated into a subjective value for the emotion that corresponds with motivational desire which, in turn, would predict the likelihood of experiencing a certain emotion. Here, we used path analysis to test this model for each emotion category, wherein evaluative and hedonic dimensions are integrated into a desirability dimension that predicts the reported frequency of emotional experience.

## Study 1A

### Method

#### *Participants*

Fifty American college students were recruited and consented to participate in the study. The recruitment sample size was determined a priori but on an ad hoc basis for exploratory analysis. Participants received course credit if they initiated the survey. Participants were excluded if they did not complete the survey ($n = 4$) or if they failed to meet data quality checks described below ($n = 4$). The final sample consisted of 42 subjects (27 females, 14 males, one nonbinary; $M_{age} =$ 18.83 years, age range = 18–21 years; self-identified racial and ethnic categories: three African American/Black, 27 Caucasian/White, one Native Hawaiian/Other Pacific Islander, zero American Indian/Alaska Native, two Asian/Asian American, nine multiracial, zero other race or identification; five Hispanic, 37 non-Hispanic). The research was approved by the institutional review board (IRB) at Pomona College.

#### *Transparency and Openness*

For all studies, we report all data exclusions, measures, and how we determined sample size. Data and analysis code are available at GitHub at https://github.com/ABS-Lab/EmotionValuation.

#### *Procedure*

Participants completed a survey in which they rated 20 emotion categories along two dimensions, evaluative (good/bad, measured separately) and hedonic (pleasant/unpleasant, measured separately). We aimed to include a wide variety of emotion categories based on the following criteria. First, we wanted to include emotion categories that we assumed would likely vary between hedonic and evaluative dimensions of emotion (e.g., lust, guilt) and those that may not vary much on those dimensions (e.g., happiness, misery) to test our main hypothesis that variation along these dimensions would depend on the emotion in question. Second, we sought to examine emotions that have been organized into sets by some researchers based on theoretical grounds. Of note, these sets are not necessarily mutually exclusive. Moreover, different scientists may view the emotions as belonging to different sets. The theoretical rationale for these sets may also be in dispute. Thus, we refer to these sets primarily for heuristic reasons. One set included (fear, anger, disgust, happiness, and surprise), which are sometimes thought of as "basic emotions" with unique evolutionary origins (Ekman & Cordaro, 2011; also see Tracy & Randles, 2011). A second set included (jealousy, shame, guilt), which are sometimes referred to as "social emotions" (Buck, 1999) and among which we also included (lust and sad). Finally, we included several other emotion categories in part to increase sampling representation around the affect circumplex (Russell, 1980), such as (calm, excitement, miserable, joy, distressed, tense, frustrated, depressed, bored, awe).

Participants were specifically instructed "to *evaluate* the emotion" as good or bad and to rate the emotion for how it *feels*, pleasurable or unpleasurable. Each judgment was made on a 0- to 100-point slider Likert-like scale, ranging from *not at all* to *very*. We also obtained measures that were not of relevance for the hypotheses of the present report including ratings for empathy (which is a mental state term but not necessarily an emotion) along the same dimensions and ratings of importance for all emotion categories (which is not necessarily valence-related). Surveys were presented using Qualtrics software on standard desktop computers and were administered to groups of participants (maximum of four participants at a time) in a lab room.

#### *Data Quality, Reliability, and Analysis*

We took several precautionary steps to ensure data quality. First, participants ($n = 4$) who did not complete the survey were excluded from analysis. Next, participants ($n = 3$) for whom 10% or more of their valuation responses fell ±2.5 *SD* from the mean across all participants for each emotion and value dimension were regarded as outliers and excluded from further analysis. Furthermore, the correlation between the mean across participants for each value dimension and each participant's emotion judgment response was calculated. Participants ($n = 1$) with correlation values lower than the $r$ score of 0.3 were removed from analysis. In order to screen out participants who could have arbitrarily chosen extreme values (100 or 0) for every question, we checked for participants ($n = 0$) with extreme rating counts that exceeded more than ±2.5 *SD* from the sample average count of extreme ratings. Last, to further screen whether subjects were paying attention to the questions, for each subject we concatenated the evaluative (good, bad) and hedonic (pleasant, unpleasant) ratings across emotions (i.e., in a 40 × 2 matrix) and correlated them (i.e., across the valence dimension). Subjects were excluded ($n = 0$) if they were ±2.5 *SD* away from the mean correlation in the sample.

We reverse scored the rating scales so that increasing values were indicative of increasing positivity along the respective dimensions. We then calculated reliability for the evaluation scale by correlating the ratings for good, reverse-scored bad judgments across emotion categories for each individual separately, and then averaged these correlations across individuals. The same procedure was implemented for the hedonic judgment scales. Reliability was acceptable across evaluative (i.e., Good and reversed Bad scales; $r = 0.84$) and hedonic (i.e., Pleasant and reverse-scored Unpleasant scales; $r = 0.88$) judgments, so we averaged these scales for each emotion. Results are reported assuming sphericity except for cases in which the Greenhouse–Geisser correction lead to statistically different results (of which there were none). Raw data and code for analyses are available at https://github.com/ABS-Lab/EmotionValuation.

## Results

Participants completed multiple ratings for multiple emotion categories resulting in a high-dimensional data set. While researchers often use data reduction methods to reduce the dimensionality of a data set (and to increase statistical power), our hypothesis—that the relationship (differential magnitude and differential correlations) between evaluative and hedonic ratings of emotion categories would depend on the emotion category in question—suggests taking a high-dimensional approach. To ensure that a high-dimensional approach was justified, we first conducted a principal components analysis (PCA) across all ratings and emotions. The PCA did not clearly support adopting a low-dimensional approach (Supplemental Materials, Figure S1).

To test whether emotion valuation depended on the dimension (evaluative or hedonic) and the emotion in question, we submitted ratings to a 20 × 2 (Emotion Category × Value Dimension) repeated measures analysis of variance (ANOVA). There was a significant main effect of emotion category, $F(19, 684) = 221.385$, $p < 10^{-276}$, $\eta_p^2 = 0.860$, indicating that some emotions were evaluated more positively than others. Critically, and as hypothesized, these findings were qualified by a significant interaction between emotion category and value dimension, suggesting the valuation of emotion categories depended on the judgment type, $F(19, 684) = 12.345$, $p < 10^{-32}$, $\eta_p^2 = 0.255$. Post hoc paired $t$ tests showed that for some emotions such as happiness, calmness, and boredom, there was little to no difference between evaluative and hedonic ratings, whereas for other emotions such as lust, joy, fear, shame, and guilt, the dimensions were different (Figure 1; Table 1).

We also tested our hypothesis by examining the correlational dependencies between evaluative and hedonic ratings for emotion categories. We calculated pairwise correlations between hedonic and evaluative ratings for each emotion category across participants. If these dimensions carry the same information, correlations would be expected to be high and not significantly different from each other across emotion categories. Alternatively, if these dimensions carry unique information depending on the emotion category in question, then the magnitude of correlation between these dimensions for some emotion categories may differ from other emotion categories. As shown in Figure 2, diagonal values, the correlations between evaluative and hedonic ratings, were very high for some emotion categories (Miserable, Surprised, Joy, all $r$s > .8), but low for other emotion categories (Shame, Fear, Guilt, all $r$s < .3). To test for statistically significant differences, we calculated $z$ scores based on Steiger's (1980) test for equality of two dependent correlations. Several correlations were significantly different from each other ($p < .05$ after Bonferroni correction), indicating that the correlation between evaluative and hedonic valuation dimension is dependent on the emotion category (Figure 2). For example, focusing on the bottom row of Figure 2 shows that evaluative and hedonic ratings were significantly more strongly correlated with each other for miserable ($r = .90$) relative to guilt ($r = .05$), fear ($r = .22$), shame ($r = .29$), and so on. Thus, whether examining mean differences or differences in correlation strength, the results suggest that these two dimensions provide distinct sources of information for emotion category valuation.

# Study 1B

## Method

### Participants

The goal of Study 1B was to test whether the main findings of Study 1A replicate and generalize to a different subject population. We recruited participants using Amazon Mechanical Turk, which tends to draw from a more diverse sample in terms of age, education, and household income (https://metrics.cloudresearch.com). A power analysis based on the interaction effect found in Study 1A and 80% power indicated a sample size of 60 (Faul et al., 2007). However, we recruited a much larger sample ($N = 205$) for several reasons. First, Study 1B is not a direct replication since there are changes in the survey method (online), the subject population, and some of the emotion words included in the survey (discussed below). Second, we wanted to obtain greater confidence on our post hoc analyses concerning how evaluative and hedonic dimensions differed for specific emotions. Third, data quality is often worse in online sample than in the onsite sample, resulting in more exclusions during data cleaning steps. Data quality procedures (described below) screened out a total of 28 participants, and six participants did not complete the survey, leaving a final sample of 171 (77 females, 93 males, one other; $M_{age} = 33.96$, age range = 18–68 years; self-identified racial and ethnic categories: 14 African American/Black, 125 Caucasian/White, zero Native Hawaiian/Other Pacific Islander, three American Indian/Alaska Native, six Asian/Asian American, two multiracial, 21 other race or identification; 22 Hispanic, 149 non-Hispanic). Participants were provided with $1.5 compensation upon completing the brief survey study. Procedures were approved by the IRB at Pomona College.

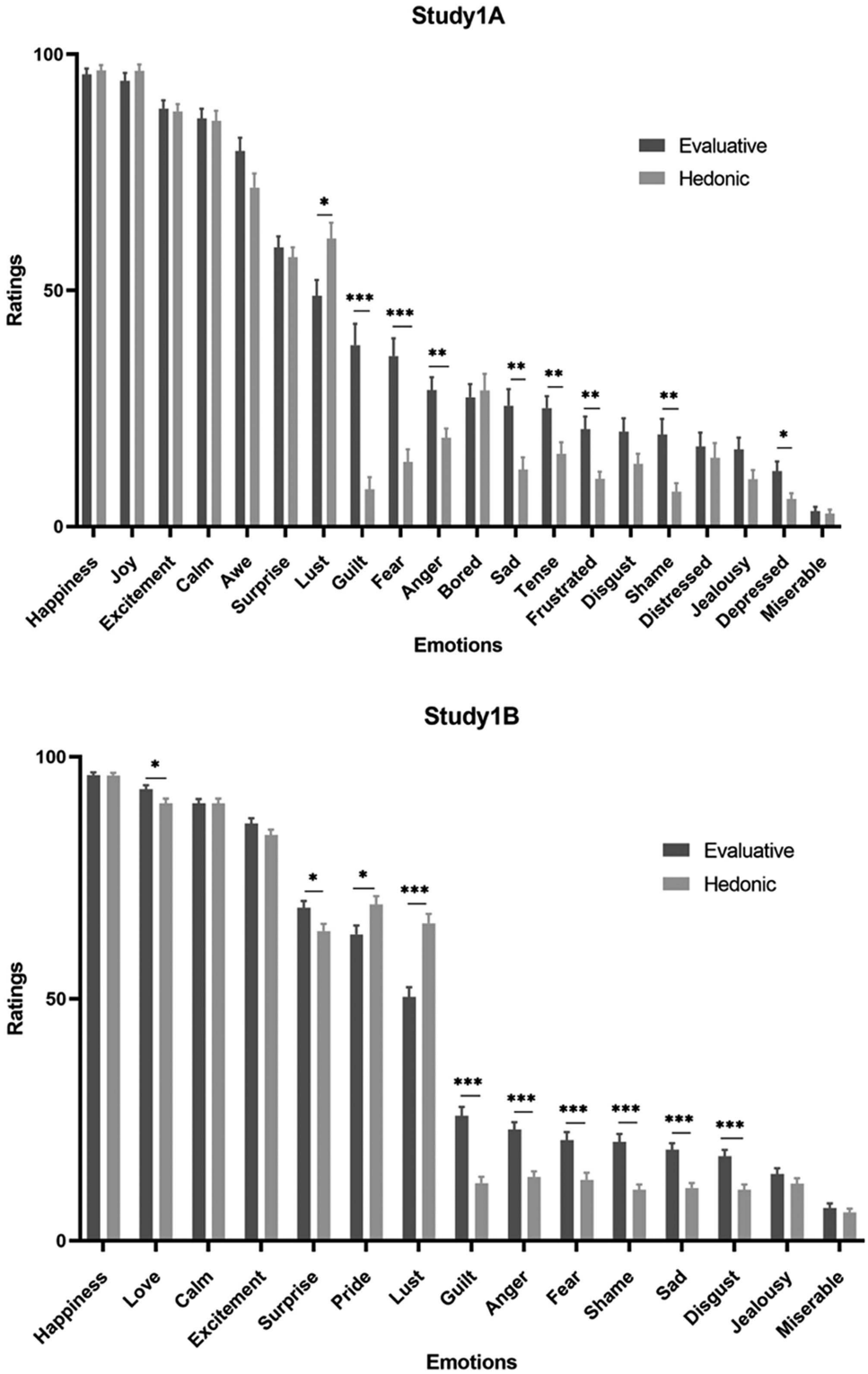
### Procedure

Participants were redirected from the Amazon Mechanical Turk website to a Qualtrics survey. To ensure data quality, participants completed a simple spelling test. Participants judged serially presented words for whether each one was spelled correctly (e.g., tomorrow) or incorrectly (e.g., "turkie"). Six of 15 words were misspelled. Based on a null-hypothesis binomial probability distribution ($n = 15$, $p = .5$), participants ($n = 15$) who got fewer than 12 correct out of 15 questions (less than 80%) on the spelling task were no different from picking answers by chance and were excluded for further analysis. Next, participants completed a similar survey as in Study 1A; they judged emotion categories along hedonic and evaluative dimensions.

As in Study 1A, we again aimed to include a wide variety of emotion categories, including some that might show variation along evaluative and hedonic dimensions, and some that would not, to best test our hypothesis of a value dimension by emotion category interaction. However, because Study 1B was conducted using participants from mTurk, we wanted to prevent a long survey from compromising the data quality. We again included the sets referred to heuristically as the basic emotions (fear, anger, disgust, happiness, surprise) and the social emotions, of which we failed to include pride and love in Study 1A and so we included them here (lust, jealousy, sad, shame, guilt, pride, love). We then omitted six emotion categories that were included in Study 1A including two

**Figure 1**

*Emotion Valuation Depends on Emotion Category and Valuation Dimension*




*Note*. The column plots show mean hedonic and evaluative ratings and standard errors for Studies 1A and 1B. Emotion categories are organized from left to right with respect to positive to negative valence ratings. See Table 1 for significance values.

**Table 1**
*Emotion Valuation Ratings Depend on Emotion Category and Valuation Dimension, Studies 1A and B*

| | Study 1A | | | | | Study 1B | | | | | Study 1A | Study 1B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Evaluative | | Hedonic | | | Evaluative | | Hedonic | | | | |
| Emotion | *M* | *SE* | *M* | *SE* | *T* | *M* | *SE* | *M* | *SE* | *T* | Significance | |
| Lust | 48.9 | 3.32 | 61.0 | 3.33 | −2.56 | 50.4 | 2.00 | 65.6 | 1.94 | −5.45 | * | *** |
| Happiness | 95.7 | 1.28 | 96.6 | 1.12 | −0.52 | 96.2 | 0.58 | 96.1 | 0.61 | 0.07 | | |
| Calm | 86.4 | 2.06 | 85.9 | 2.13 | 0.17 | 90.4 | 0.90 | 90.4 | 0.97 | −0.06 | | |
| Excitement | 88.5 | 1.75 | 87.9 | 1.55 | 0.28 | 86.2 | 1.12 | 83.8 | 1.18 | 1.50 | | |
| Miserable | 3.3 | 0.92 | 2.8 | 0.81 | 0.43 | 6.8 | 0.90 | 5.8 | 0.81 | 0.81 | | |
| Disgust | 20.1 | 2.81 | 13.3 | 2.10 | 1.90 | 17.4 | 1.37 | 10.5 | 1.10 | 3.98 | | *** |
| Jealousy | 16.3 | 2.54 | 10.0 | 1.95 | 1.98 | 13.8 | 1.19 | 11.8 | 1.08 | 1.23 | | |
| Sad | 25.6 | 3.50 | 12.1 | 2.53 | 3.17 | 18.8 | 1.37 | 10.9 | 1.04 | 4.59 | ** | *** |
| Shame | 19.5 | 3.30 | 7.4 | 1.78 | 3.25 | 20.4 | 1.67 | 10.5 | 1.13 | 4.88 | ** | *** |
| Fear | 36.1 | 3.74 | 13.7 | 2.64 | 4.93 | 20.8 | 1.65 | 12.6 | 1.43 | 3.76 | *** | *** |
| Guilt | 38.4 | 4.54 | 7.9 | 2.59 | 5.83 | 25.8 | 1.86 | 11.9 | 1.29 | 6.16 | *** | *** |
| Surprise | 59.1 | 2.31 | 57.1 | 2.04 | 0.65 | 68.8 | 1.41 | 64.0 | 1.48 | 2.38 | | * |
| Anger | 28.9 | 2.73 | 18.8 | 1.96 | 3.03 | 23.0 | 1.50 | 13.2 | 1.15 | 5.23 | ** | *** |
| Joy | 94.4 | 1.66 | 96.5 | 1.36 | −0.95 | | | | | | | |
| Bored | 27.4 | 2.76 | 28.8 | 3.55 | −0.31 | | | | | | | |
| Distressed | 16.9 | 3.01 | 14.5 | 3.18 | 0.54 | | | | | | | |
| Awe | 79.5 | 2.81 | 71.8 | 2.96 | 1.87 | | | | | | | |
| Depressed | 11.7 | 2.10 | 5.8 | 1.25 | 2.45 | | | | | | * | |
| Tense | 25.1 | 2.50 | 15.4 | 2.43 | 2.81 | | | | | | ** | |
| Frustrated | 20.6 | 2.71 | 10.1 | 1.50 | 3.39 | | | | | | ** | |
| Pride | | | | | | 63.3 | 1.82 | 69.5 | 1.69 | −2.53 | | * |
| Love | | | | | | 93.3 | 0.82 | 90.4 | 0.96 | 2.34 | | * |

*Note*. The table presents the mean, standard error, and results from paired *t* tests (*T* values and significance levels) for comparing evaluative and hedonic valuation of emotion categories for Studies 1A and 1B. Participants rated each emotion category for evaluative goodness and hedonic pleasantness. For each study, a significant interaction showed that the valuation of emotion depended on the valuation dimension and emotion category in question. The table further illustrates post hoc comparisons of mean differences in valuation dimension ratings for each emotion category across studies. The pattern of findings across studies are similar. For example, lust showed a higher hedonic than evaluative rating and a negative *T* value across studies; guilt and fear showed higher evaluative than hedonic ratings and a positive *T* value across studies; and calm had a negligible difference across studies with *T* values close to 0 across studies. The predicted two-way interaction of emotion category and valuation dimension is unpacked by the finding that mean valuation differences are observed for some emotions but not others. The table is sorted by first grouping together emotion categories that were consistently included across studies and, second, by ascending *T* scores.
* $p < .05$. ** $p < .01$. *** $p < .001$.

(depressed, joy) because they closely approximated other emotion categories (i.e., sad, happy) and four others (tense, frustrated, distressed, bored, awe), while keeping three additional emotion categories to broaden sampling representation around the affect circumplex (calm, excitement, miserable).

### *Data Quality and Analysis*

Data quality procedures as described in Study 1A were followed to identify and exclude participants ($n = 13$, total) whose responses deviated from the overall sample. We reverse scored the Bad and Unpleasant scale so that increasing values were indicative of increasing positive valence. Reliability was very high across evaluative (i.e., Good and reverse-scored Bad scales; $r = 0.99$) and hedonic (i.e., Pleasant and reverse-scored Unpleasant scales; $r = 0.98$) dimensions, and these ratings were averaged for each emotion. Results are reported assuming sphericity unless otherwise noted for cases in which the Greenhouse–Geisser correction lead to statistically different results (of which there were none).

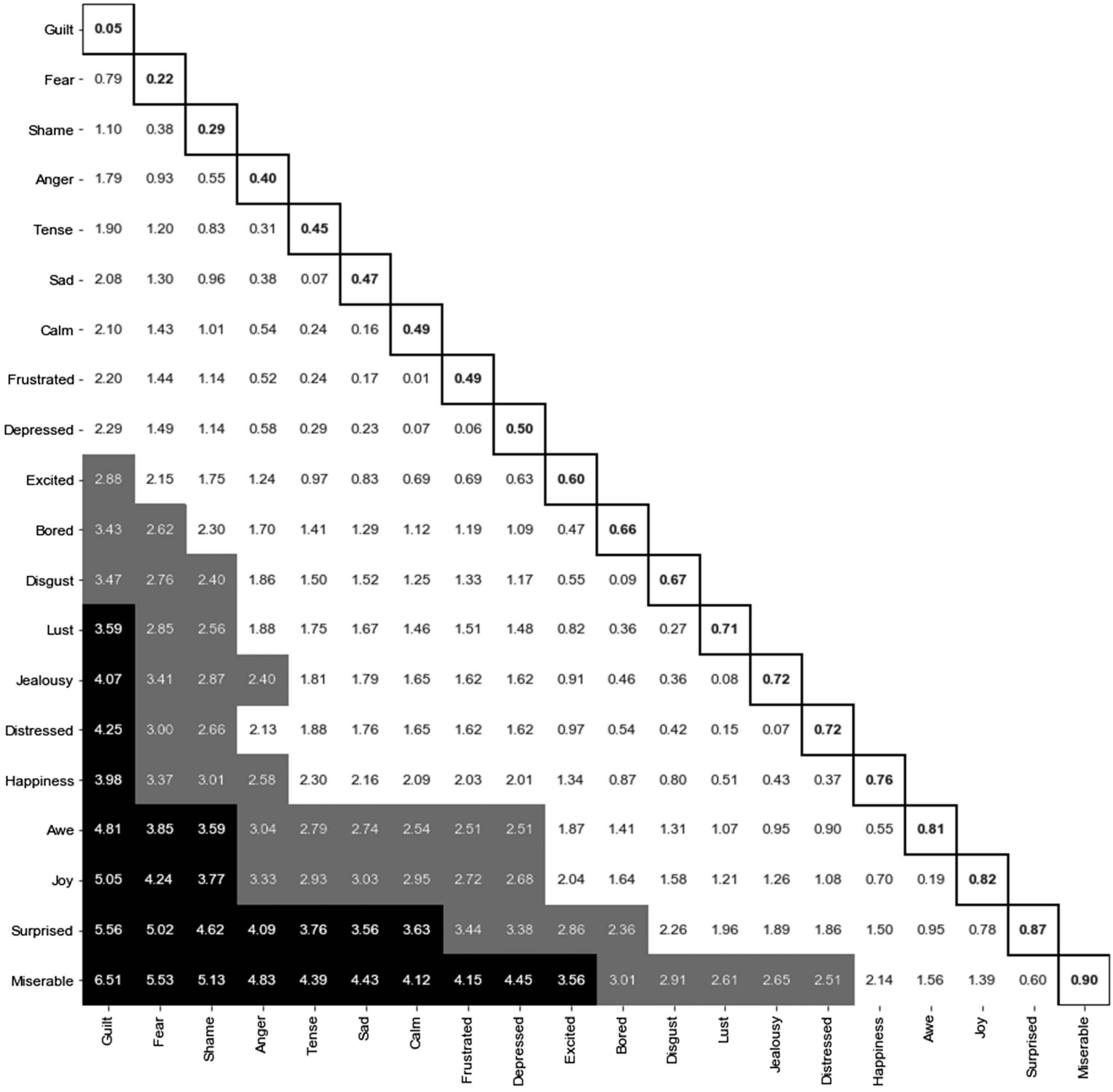
## Results

Emotion valuation ratings were submitted to a 15 × 2 (Emotion Category × Value Dimension) repeated measures ANOVA. We observed a main effect of emotion category, $F(14, 2380) = 915.854$, $p < 10^{-70}$, $\eta_p^2 = 0.843$, that was qualified by a significant interaction between emotion category and value dimension, $F(14, 2380) = 42.810$, $p < 10^{-104}$, $\eta_p^2 = 0.201$, suggesting that emotion valuation depended on the dimension and emotion in question. Post hoc paired *t* tests were conducted to examine mean differences in evaluative and hedonic value ratings for each emotion category. Some emotion categories (calm, happiness, and misery) showed little to no difference between mean evaluative and hedonic ratings, but several others did. As shown in Figure 1 and Table 1, these included lust, shame, fear, guilt, and anger that were also examined in Study 1B and love and pride, which were newly included in Study 1B.

We then tested our hypothesis by examining the correlational dependencies between evaluative and hedonic ratings for emotion categories. Pairwise correlations of the evaluative and hedonic valuation dimensions were calculated for each emotion category (Figure 3, diagonal values), and then compared against each other using *z* scores based on Steiger's test for equality of two dependent correlations (Figure 3, off-diagonal values). This analysis showed that many pairs of emotion categories had statistically different correlations ($p < .05$ after Bonferroni correction), indicating that the correlation between evaluative and hedonic valuation dimensions depends on the emotion category. These findings replicate the main

**Figure 2**

*Differences in the Covariance Structure for Evaluative and Hedonic Dimensions of Emotion Valuation, Study 1A*



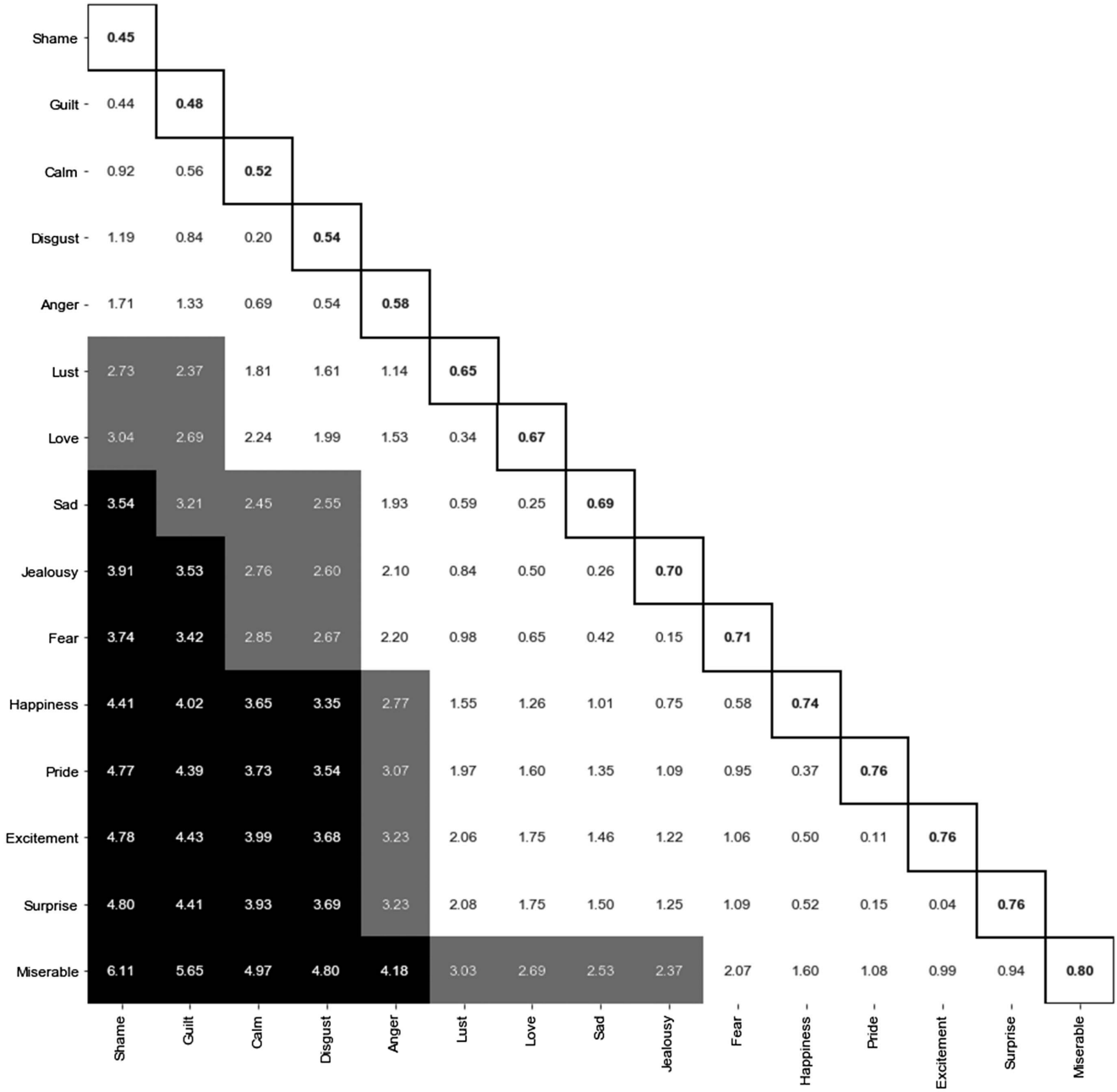

*Note*. For each emotion category, a Pearson correlation was calculated between hedonic and desirability ratings, which are presented along the diagonal in boxes. To test whether the correlation between these ratings depended on the emotion in question, we conducted tests for differences in dependent correlations pairwise between emotions using Steiger's comparison of dependent correlations, which are presented as $z$ scores along the off-diagonal. Scores shaded in shaded in black are significant at $p < .05$, Bonferroni-corrected for multiple comparisons; scores shaded in gray are significant at $p < .01$, uncorrected. The many significant differences between amount of shared variance of the hedonic and evaluative emotion valuations is consistent with the hypothesis that evaluative and hedonic dimensions of emotion make distinct contributions to emotion valuation depending on the emotion in question.

findings of Study 1A and generalize the findings to a different sampling population.

Given the larger sample size in Study 1B and the relatively large number of variables (i.e., 30 measures), we examined whether valuation ratings for emotion categories organized into an interpretable, low-dimensional space using PCA. We extracted components using the convention of eigenvalues >1, which produced eight components that explained 70.6% of the variance (Supplemental Table S2). We then inspected the loadings in the component matrix (Figure 4) to see whether certain emotion

**Figure 3**

*Differences in the Covariance Structure for Evaluative and Hedonic Dimensions of Emotion Valuation, Study 1B*



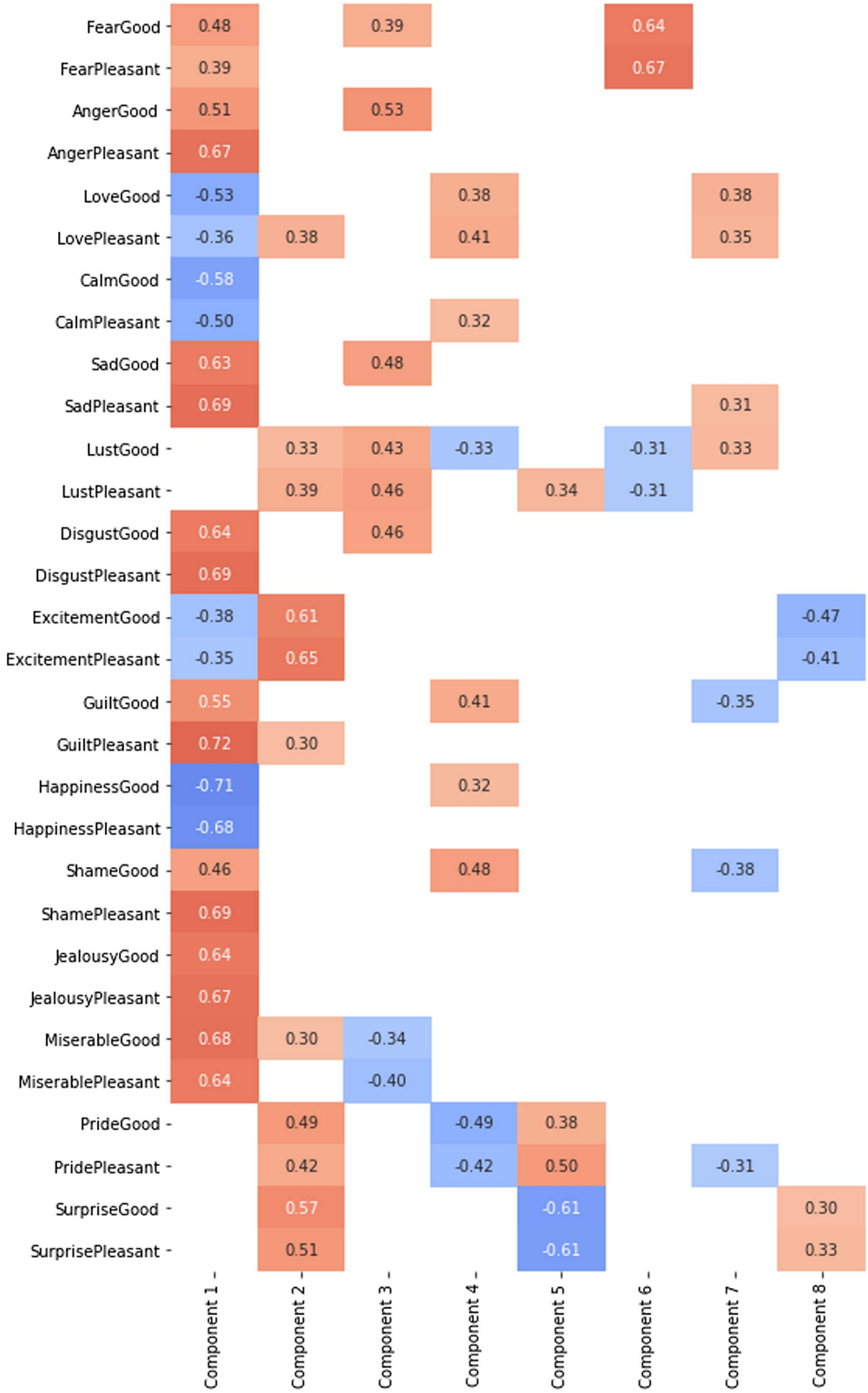

*Note*. See caption of Figure 2 for details, which illustrates similar findings for Study 1A.

categories loaded on the same components based on shared variance in the valuation ratings.

Perhaps unsurprisingly, given prior work using dimensionality reduction methods in a variety of content domains (e.g., Osgood et al., 1957; Thornton & Tamir, 2020), valuation ratings for both goodness and pleasantness ratings for most emotion categories loaded on the first dimension. Emotion categories that did not load strongly on Component 1 included lust, pride, and surprise. However, valuation ratings for nearly every emotion category also loaded on other components, too, and loadings on certain other components also depended on the emotion category and valuation rating. Of these, Component 3 seemed to reflect the positive evaluation (goodness) of certain negative and ambivalent emotion categories including fear, anger, sadness, and lust. Component 4 seemed to reflect modesty and prosociality in that it captured variance in overall valuation ratings (good and pleasant) in love, calm, and absence of pride (i.e., a negative loading), and only the evaluative ratings of the negative emotion categories shame and

**Figure 4**

*Component Matrix for Principal Components Analysis, Study 1B*




*Note*. Component loadings less than |.3| were suppressed for visualization. Evaluative and hedonic ratings for several components are differentially distributed across components. For example, for lust, guilt, shame, calm, and other emotion concepts, there are some loadings that may be selective for either evaluative or hedonic ratings. See Table 2 for component descriptions. See the online article for the color version of this figure.

guilt, which may be of importance for seeking forgiveness and repairing social relationship. The remaining components did not clearly differentiate between valuation dimensions for emotion categories. Component 2 reflected valuation of relatively ambiguous or ambivalent emotion categories (e.g., surprise, lust, pride). Components 5 and 6 reflected overall valuation (good and pleasant) of the emotion categories surprise and fear, respectively. Component 7 reflected valuation (good and pleasant) of positive valence, prosocial emotions (positive loadings of love and lust; negative loadings with guilt, shame, and pride). Table 2 provides a summary of component interpretations.

## Discussion

The aim of Studies 1A and 1B was to address whether evaluative ratings of emotion categories are informationally distinct from hedonic ratings of emotion categories. To address this question, we conducted several analyses that examined both mean differences and correlations in ratings. On the one hand, the broad brushstrokes of the results could be interpreted as supporting informational redundancy. When inspecting Figure 1, it is obvious that evaluative and hedonic ratings strongly track with one another. Indeed, the Pearson correlation of the mean ratings for evaluative and hedonic ratings across emotion categories equaled .97 for Study 1A and .98 for Study 1B. Also, when examining individual emotion categories, the correlations between evaluative and hedonic ratings for many emotion categories were also quite high ($r$ values $> .6$) as indicated in the diagonal values of Figures 2 and 3. The PCA for Study 1B, as well, returned components that did not exhibit strong differentiation by valuation dimension. Note, we also performed PCA on Study 1A data, which led to similar findings despite the small sample size (see Supplemental Materials, Figure S1, and Table S1).

On the other hand, the results also suggest that these valuation dimensions provide distinct information concerning emotion categories. The mean ratings of evaluative and hedonic ratings were significantly different from each other for certain emotion categories. The correlations between these ratings were also significantly lower for some emotion categories in comparison to others, suggesting nonredundancy of information. The PCA also returned components with loadings that seemed to be specific to the evaluative dimension for certain emotion categories. The results from Studies 1A and 1B also converged as to which emotion categories tend to show greater differentiation between evaluative and hedonic dimensions. For example, evaluative and hedonic ratings of happiness (and also misery) did not show a significant mean difference and tended to correlate highly with each other. In contrast, these valuation dimensions were distinct for other emotion categories such as guilt, anger, shame, lust, and pride. The PCA may help organize some of these findings. Goodness for the emotion categories (fear, anger, sadness, lust) loaded strongly on Component 3. Goodness ratings for shame and guilt loaded more strongly on Component 4 (along with more global valuation ratings for love, calm, and antipride). Bearing these findings in mind, we next sought to test whether the valuation of emotion categories further interacts with cultural background.

**Table 2**
*Component Interpretation From Principal Components Analysis, Study 1B*

| Component |
|---|
| 1: Valence (good and pleasant) for most emotion categories except lust, pride, and surprise |
| 2: Valence for relatively more ambiguous (e.g., surprise) or ambivalent (e.g., lust, pride) emotion categories |
| 3: Goodness of certain negative emotion categories (fear, anger, sadness) and lust |
| 4: Valuation (good and pleasant) of modesty and prosociality, including love, calmness, and antipride, and the goodness of negative emotion categories that may anticipate seeking forgiveness and social acceptance (shame, guilt) |
| 5: Valuation (good and pleasant) of surprise |
| 6: Valuation (good and pleasant) of fear |
| 7: Valuation (good and pleasant) of positive valence, prosocial emotions (positive loadings of love, and lust; negative loadings with guilt, shame, and pride) |
| 8: Valuation (good and pleasant) of valence-ambiguous emotion categories (surprise and excitement) |

## Study 2

Prior research suggests that the valuation of emotion categories is passed down through culture (Tsai et al., 2006; Uchida et al., 2013). Study 2 tested whether the evaluative and hedonic valuation of emotion categories is distinctly influenced by cultural background. We predicted a three-way interaction between cultural background, valuation dimension, and emotion category.

## Method

### Participants

Asian American ($N = 67$; 39 female, 28 male; $M_{age} = 24.45$ years, age range = 18–51) and Caucasian American ($N = 54$; 23 female, 31 male; $M_{age} = 33.74$ years, age range = 19–59 years) participants completed an online survey. No formal power analysis was conducted to determine sample size; however, all statistical analyses were conducted after the full sample was collected. Links to the survey were advertised on Mechanical Turk, on article flyers posted in nearby communities, and on social media. Participants from Mechanical Turk received $1.50. Participants recruited from nearby communities received $5 Amazon gift cards after completing the online survey. We only recruited Asian American participants with an Eastern Asian background (Chinese, Japanese, Korean). All participants were born in the United States or immigrated to the United States before the age of 12. Procedures were approved by the IRB.

Data quality procedures described in Study 1 were followed to exclude deviant participants ($N = 15$, total and were not included in the demographic descriptive statistics above). To ensure our Asian American participants were representative of the Asian American population at large, participants completed the Asian American Multidimensional Acculturation scale (Gim Chung et al., 2004). The distribution of scores in our Asian American sample ($M = 3.00$, $SD = 0.62$) was similar to the distribution used to validate the scale ($M = 3.11$, $SD = 0.68$) as reported in the study by Gim Chung et al. (2004).

### Procedure and Analysis

Participants completed the study online using a Qualtrics survey similar to Studies 1A and 1B. The study was designed to examine both cultural background and transiently primed cultural values;

however, a manipulation check of the value priming manipulation indicated that it was not effective. Procedural details of the priming manipulation are provided in the Supplemental Materials. For emotion category selection, we aimed to include emotion categories to best test our hypothesis of a three-way interaction between value dimension, emotion category, and culture, while also trimming down the number of emotion categories to enhance data quality and reduce incompletion rates. We included the sets referred to heuristically as the basic emotions (fear, anger, disgust, happiness, surprise), a subset of the social emotions (lust, sadness, shame, guilt, pride), and a low-arousal positive emotion category (calm). We did not include jealousy due to an oversight. We also included excitement owing to prior work showing variation by culture in the valuation of excitement (Tsai et al., 2006). To keep the survey brief, we omitted the other emotion categories.

As in Studies 1A and 1B, the reliability of emotion value judgments was acceptable across evaluative (i.e., correlation between good and reverse-scored bad judgments, $r = .75$) and hedonic (i.e., correlation between pleasant and reverse-scored unpleasant, $r = .77$) judgments. To analyze our data, we conducted a repeated measures ANOVA. Results are reported assuming sphericity unless otherwise noted for cases in which the Greenhouse–Geisser correction leads to statistically different results. We conducted analyses controlling for age and gender to control for demographic discrepancies between groups.

## Results

We submitted the emotion ratings to a 2 (Valuation Dimension) × 12 (Emotion Category) × 2 (Cultural Background) × 2 (Cultural Value Priming) mixed-design analysis of covariance controlling for age and gender. There was a main effect of emotion indicating that some emotions were rated as more positive than others, $F(11, 1067) = 25.65$, $p < 10^{-47}$, $\eta_p^2 = .209$. There was also an emotion by culture interaction, indicating that the global positive or negative evaluation of an emotion differed between Asian American and Caucasian American participants, $F(11, 1067) = 7.855$, $p < 10^{-13}$, $\eta_p^2 = .075$.

As shown in Table 3, when collapsing across valuation dimensions, Asian American participants on average had a less global negative valuation of several negative emotions including sadness, shame, guilt, fear, and disgust. Asian American participants also had a less positive valuation of pride and lust relative to Caucasian American participants. Indeed, these two emotions fell into the negative valence spectrum for Asian American participants but were in the positive valence spectrum for Caucasian American participants. Finally, there were no significant differences in valuation for several other emotions between the two groups. Critically, however, this two-way interaction was qualified by the hypothesized three-way interaction between emotion, valuation dimension, and cultural background, Greenhouse–Geisser, $F(7, 1089) = 2.934$, $p < .005$, $\eta_p^2 = .029$. This result indicates that cultural differences in emotion valuation differ depending on both evaluative versus hedonic dimension and the emotion category in question.

To further explore which emotions showed a valuation dimension by cultural background interaction, we conducted 2 (Valuation Dimension) × 2 (Cultural Background) ANOVAs for each emotion category separately, controlling for age and gender. Underscoring the three-way interaction, and as shown in Table 3, the valuation by emotion interaction showed no cultural influence for some emotion categories (e.g., happiness, lust, fear), whereas others exhibited evidence of an interaction effect (e.g., shame, sadness, and anger). Table 3 is sorted by the effect size of the culture by valuation interaction for each emotion category. The interaction effect was mainly observed for several negative emotion categories including anger, sadness, shame, and guilt. Descriptively, for the evaluative

**Table 3**
*Evaluative and Hedonic Ratings of Emotion Concepts Depend on Cultural Background*

| | Asian American | | Caucasian American | | Culture × Valuation | | Culture | |
|---|---|---|---|---|---|---|---|---|
| Emotion | Good | Pleasant | Good | Pleasant | *F* | *Np* | *F* | *Np* |
| Lust | 22.83 | 47.00 | 45.44 | 66.27 | 0.76 | 0.01 | 9.96** | 0.09 |
| Fear | 38.74 | 18.34 | 27.58 | 10.56 | 1.34 | 0.01 | 5.93* | 0.06 |
| Disgust | 26.00 | 16.41 | 16.50 | 7.50 | 1.68 | 0.16 | 5.97* | 0.06 |
| Calm | 84.97 | 82.02 | 90.31 | 91.79 | 1.71 | 0.02 | 4.13* | 0.04 |
| Happiness | 91.34 | 91.45 | 94.98 | 94.12 | 2.37 | 0.02 | 0.50 | 0.01 |
| Pride | 34.36 | 42.69 | 56.71 | 61.08 | 3.03 | 0.03 | 15.81*** | 0.13 |
| Excitement | 82.24 | 79.78 | 90.79 | 84.73 | 3.80 | 0.04 | 2.93 | 0.03 |
| Surprise | 60.74 | 58.16 | 68.58 | 62.33 | 5.56* | 0.05 | 1.50 | 0.01 |
| Guilt | 44.14 | 15.86 | 26.54 | 10.94 | 5.66* | 0.05 | 4.553* | 0.04 |
| Shame | 30.71 | 14.76 | 16.56 | 8.31 | 6.65* | 0.06 | 10.88** | 0.10 |
| Sadness | 44.84 | 19.19 | 27.79 | 11.65 | 7.03** | 0.06 | 8.43** | 0.08 |
| Anger | 30.76 | 14.21 | 20.33 | 15.21 | 10.98** | 0.10 | 3.24 | 0.03 |

*Note.* The table summarizes results from Study 3 showing that cultural background differentially influences evaluative and hedonic dimensions of emotion knowledge. The table presents mean ratings for evaluative (Good) and hedonic (Pleasant) ratings, followed by the *F* statistic for the two-way Culture × Valuation dimension interaction and effect size (*Np*), and finally the main effect of culture regardless of valuation dimension and effect size. The three-way interaction between cultural background, emotion concept and rating dimension suggest that there are significant two-way interactions for some emotions (e.g., anger, sadness, shame) and not for other emotions (e.g., happiness, lust, fear). While not the focus of this study, Asian American participants had an overall higher positive valuation of several emotions, including shame and sadness, and a lower positive valuation of lust and pride.
* $p < .05$. ** $p < .01$. *** $p < .001$.

judgment, Asian American participants tended to rate these negative emotions as less negative than Caucasian American participants (across those four emotions, $M = 37.61$ and 22.81, respectively), but this difference was less pronounced for the hedonic judgments ($M =$ 16.01 and 11.53, respectively). There were no significant effects (including higher order interactions) involving age or gender (all $ps > .10$). A manipulation check indicated that the cultural value priming manipulation was not successful, and perhaps because of this, no interactions or main effects were observed with this manipulation (see Supplemental Materials for details).

## Discussion

Our findings are broadly consistent with prior theory and research suggesting that cultural background contributes to emotion valuation (Tsai, 2007). Past work suggests that shame and guilt are less negatively regarded in cultures with greater interdependent than independent values (for a review, see Bedford & Hwang, 2003; Eid & Diener, 2001; Wong & Tsai, 2007). Consistent with those views, we found that while both Asian American and Caucasian American participants rated shame and guilt as hedonically highly unpleasant emotions, Asian Americans had less negative evaluations of these emotion categories. This pattern was also not specific to guilt and shame. We found that Asian American participants had more positive valuations of other negative emotion categories including anger and sadness, too, relative to Caucasian American participants. These findings are consistent with prior work by Sims et al. (2015), who found that Chinese Americans rated several negative affect emotion categories as relatively less undesirable than European Americans. Notably, these emotion categories were among those that also showed greater differentiation in valuation dimensions in Studies 1A and 1B, suggesting that certain emotion categories are more likely to show variation in valuation dimensions (we return to this point below in Figure 5). Thus, the present findings suggest that cultural background differentially informs the hedonic and evaluative dimensions of emotion valuation. One difference between our study and past work is that we measured evaluative goodness rather than the desire to feel these states. In the next study, we examine the relationship between all three valence-related dimensions including hedonic, evaluative, and desired/ideal emotions.

# Study 3

According to affect valuation theory (Tsai, 2007), emotions also vary in how much people want or desire to feel them (also see, Barrett, 1996; Kitayama et al., 2000). Prior work has shown that the desire to experience certain emotions is distinct from their hedonic value (Tsai et al., 2006). Here, we further tested whether desirability is also distinct from evaluative beliefs about emotion categories. A second purpose of Study 3 was to examine whether the evaluative dimension also plays a role in explaining people's beliefs about the emotions they feel in everyday life (Scheibe et al., 2013). We aimed to evaluate the model presented in Figure 6, which we developed from an integration of affect valuation theory with VBDM as described in the Introduction. Mediation and path analysis were used to evaluate the theoretical model that evaluative and hedonic dimensions influence desirability, which in turn predicts beliefs about the frequency of emotional experience.

## Method

### Participants

Two hundred eighteen participants were recruited and provided with $1.5 upon completing the study via Mechanical Turk. Since Study 3 added new evaluation dimensions to the design of Study 1 A and 1B, we did not perform a formal power analysis but based our sample size on the sample of Study 1B due to the similar nature of the studies. Participants were excluded from analysis if they did not complete the study ($n = 15$) or if they failed to meet data quality procedures ($n = 53$), which was greater in this sample than in Studies 1B and 2 because the mTurk recruitment platform had a higher infiltration of bots during this recruitment period (for additional details and comparative data for included and excluded samples, please see Supplemental Materials including Figure S3). The final sample included 149 participants (58 females, 91 males; $M_{age} =$ 34.67, age range = 21–71 years; self-identified racial and ethnic categories: 15 African American/Black, 89 Caucasian/White, four American Indian/Alaska Native, 39 Asian/Asian American, two other race or identification; 22 Hispanic, 127 non-Hispanic). Study procedures were approved by the Pomona College IRB.

### Procedure and Analysis

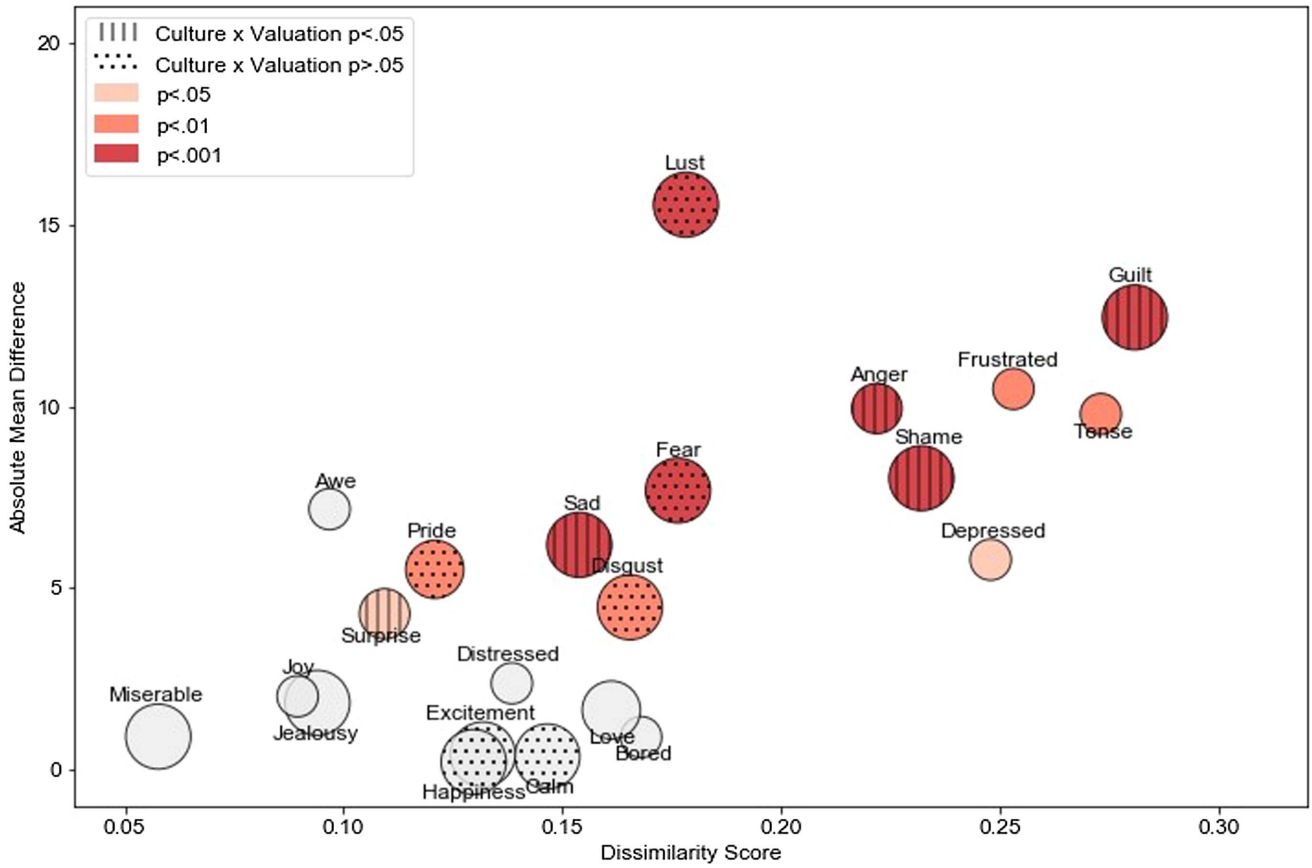
Participants completed the study online using a Qualtrics survey similar to the prior studies but with additional questions to rate for each emotion category on how much they would "ideally like to have experienced [the emotion] over a typical week" and "how often you experience [the emotion] over a typical week" (Scheibe et al., 2013; Tsai, 2007). Since Studies 1 and 2 demonstrated high reliability in the unidirectional scales, we changed from using two unidirectional scale to one bidimensional scale for each question (*very bad* to *very good*, *very unpleasant* to *very pleasant*, etc.) to reduce the time required for survey completion. For the emotion category selection, because we were asking several more questions per emotion category than in prior surveys, we aimed to reduce the total number of emotion categories to keep the survey brief for data quality. Thus, we included only the heuristic categories of basic and social emotions, albeit due to an oversight, anger and surprise were not included resulting in a total of 13 emotion categories. Results are reported assuming sphericity unless otherwise noted for cases in which the Greenhouse–Geisser correction leads to statistically different results (of which there were none).

Mediation analyses were conducted to determine whether the direct pathways from evaluative and hedonic dimensions to self-reported frequency of emotion were mediated by the desired dimension. All mediations were run with the Process (V3.3) for SPSS (Version 25).

Path analysis was used to estimate the hypothesized relationships between evaluative, hedonic, and desirability dimensions and to predict the frequency of self-reported emotions occurring in daily life. Both Bayesian and Frequentist methods were used to estimate the standardized coefficients for each path in our proposed model for robustness to analytical approach. Bayesian path coefficients were estimated using python scripts with pymc3 for each regression in the path analysis (Salvatier et al., 2016). Models were fit for each emotion separately using Monte Carlo Markov Chain sampling using chains with a 1,000-sample tuning period, followed by 10,000 sample chains. Samples generated from the Monte Carlo Markov

**Figure 5**

*Evaluative and Hedonic Dimensions Make Distinct Contributions to Emotion Valuation*



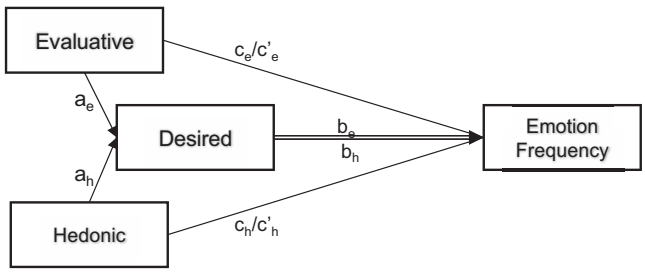

*Note.* The figure provides a comprehensive illustration of the differences in means and correlational dependencies in evaluative and hedonic ratings of emotion categories, which interact with cultural background. For each emotion, differences in means and correlations were both examined for evaluative versus hedonic ratings. The *y*-axis marks the mean difference in evaluative and hedonic ratings for each emotion category, and the color coding from gray to red reflects the *p* value for significant differences. The *x*-axis marks the dissimilarity score (i.e., higher values indicates less shared variance) between evaluative and hedonic ratings for each emotion category. The evaluative dimension contributes more distinctly to emotion valuation in terms of both the mean valuation difference and correlational dependency for the emotion categories in the top right quadrant. The line textures indicate that there was a significant culture by evaluation dimension interaction in the mean ratings for the emotion from Study 2, dots indicate nonsignificant interactions, and no texture indicates that the emotion was not included in Study 2. For robustness and to simplicity, we aggregated the evaluative and hedonic ratings across studies. Circle size corresponds to the sample size providing ratings for each emotion category. Largest to smallest circles: $N = 372$ for emotions included in Studies 1A, 1B, and 4 (miserable, jealousy, guilt, excitement, sad, fear, shame, happiness, lust, disgust). $N = 320$ for emotions included in Studies 1B and 3 (love, pride). $N = 213$ for emotions included in Studies 1A and 1B (surprise, anger). $N = 42$ for emotions included in Study 1A only (tense, frustrated, distressed, joy, bored, depressed, awe). Emotions for which evaluative and hedonic dimensions have distinct information are in the top right of the plot (e.g., guilt, lust, anger, shame). Cultural interactions with valuation are also observed for some of these emotions (e.g., guilt, anger shame). The plot illustrates that evaluative and hedonic dimensions make distinct contributions to emotion valuation depending on the emotion in question and are influenced by cultural background. See the online article for the color version of this figure.

Chains were used to estimate the 95% highest posterior density interval for each path coefficient. We also include Frequentist coefficient estimates, goodness of fit statistics ($\chi^2$, root-mean-square error of approximation) calculated with *semopy*, a structural equation modeling python package (Georgy & Anna, 2019).

## Results

We conducted a 13 (Emotion Category) × 3 (Valuation Dimension) repeated measures ANOVA. Emotion categories varied in their overall rating of valence when collapsing across valence-related valuation dimensions, $F(12, 1776) = 580.98$, $p < 10^{-163}$, $\eta_p^2 = 0.797$. However, this main effect was qualified by a significant interaction with valuation dimension indicating that the valuation of emotion depends on the dimension and emotion in question, $F(2, 3552) = 19.332$, $p < 10^{-76}$, $\eta_p^2 = 0.115$. To test our specific hypothesis that the evaluative dimension distinctly contributes to emotion valuation from the desirability dimension, we performed a 13 × 2 ANOVA with just the evaluative and desired dimensions. The main effect of emotion category, $F(12, 1776) = 514.503$, $p < 10^{-174}$, $\eta_p^2 = 0.777$, was qualified by a predicted interaction with valuation dimension, $F(12, 1776) = 6.076$, $p < 10^{-9}$,

**Figure 6**
*Mediation Models for Evaluative, Hedonic, and Desired Contributions to Emotion Frequency*




*Note.* The figure illustrates the hypothesis that evaluative and hedonic beliefs about emotions influence the desire to experience an emotion, which in turn influences the frequency of emotional experience. Subscripts "e" and "h" for parameters refer to the evaluative and hedonic dimensions, respectively. See Table 4 for statistical tests of mediation models for each emotion.

$\eta_p^2 = 0.039$, indicating that the evaluative dimension contributes distinctly to emotion valuation from the desirability dimension. *t* tests comparing the evaluative and ideal dimensions of emotion valuation showed significant mean differences between the ratings on the evaluative and ideal dimensions for several emotions including excitement, happiness, and guilt (Table 4).

We then tested our hypothesis by examining the correlational dependencies between evaluative and desired ratings for emotions. Pairwise correlations of the evaluative and desired valuation dimensions were calculated for each emotion category (Figure 7, diagonal values), and then compared against each other using *z* scores based on Steiger's test for equality of two dependent correlations (Figure 7, off-diagonal values). This analysis showed that some pairs of emotion categories had statistically different correlations ($p < .05$ after Bonferroni correction), indicating that the correlation between evaluative and desired valuation dimensions depends on the emotion category. These findings add further support to the hypothesis that evaluative and ideal affect dimensions make a distinct contribution to emotion valuation.

As a third replication test for Studies 1A and 1B, we performed the same analyses to compare the evaluative and hedonic dimensions. A 13 × 2 (Emotion Category × Value Dimension) repeated measures ANOVA with the hedonic and evaluative value dimensions showed a main effect of emotion category, $F(12, 1776) = 571.606$, $p < 10^{-171}$, $\eta_p^2 = 0.794$. There was also a significant interaction between emotion category and value dimension, indicating that emotion valuation depends on the dimension and emotion in question, $F(12, 148) = 23.496$, $p < 10^{-48}$, $\eta_p^2 = 0.137$. Post hoc tests on specific emotions were not as strong as in Studies 1A and 1B, which is likely due to methodological differences between the studies (see Supplemental Table S3 for details). An examination of the correlation matrix in Study 3 also showed a similar pattern of results as in Studies 1A and 1B (Supplemental Figure S4).

**Table 4**
*Evaluative and Desirability Ratings of Emotion Categories, Study 3*

| | Evaluative | | Desired | | | |
|---|---|---|---|---|---|---|
| Emotion | *M* | *SE* | *M* | *SE* | Significance | *T* |
| Miserable | 16.21 | 2.10 | 14.95 | 2.09 | | 0.42 |
| Sadness | 17.53 | 1.69 | 14.65 | 1.76 | | 1.18 |
| Jealousy | 20.29 | 1.90 | 16.87 | 1.95 | | 1.25 |
| Calm | 83.33 | 1.35 | 80.60 | 1.53 | | 1.34 |
| Fear | 18.46 | 1.88 | 14.74 | 1.92 | | 1.38 |
| Disgust | 20.40 | 1.84 | 16.19 | 1.94 | | 1.57 |
| Lust | 46.57 | 2.28 | 40.47 | 2.18 | | 1.93 |
| Shame | 19.66 | 1.96 | 13.81 | 1.83 | * | 2.19 |
| Love | 92.99 | 0.82 | 90.01 | 1.08 | * | 2.20 |
| Pride | 75.89 | 1.62 | 70.14 | 1.82 | * | 2.36 |
| Guilt | 21.36 | 1.90 | 14.05 | 1.74 | ** | 2.84 |
| Happy | 93.52 | 0.79 | 86.99 | 1.59 | *** | 3.67 |
| Excitement | 83.69 | 1.13 | 69.15 | 1.81 | *** | 6.80 |

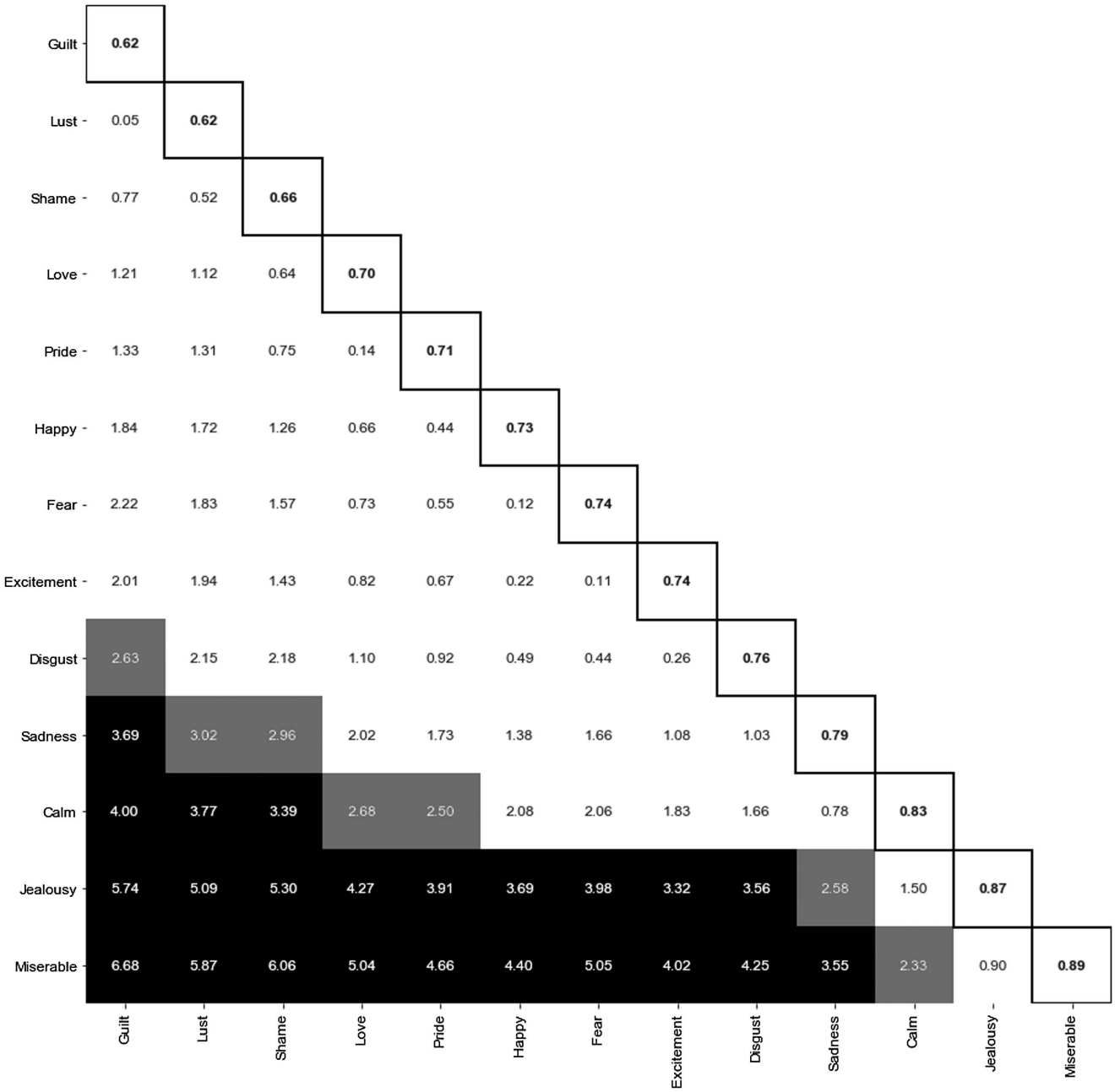
*Note.* The table presents the mean, standard error, and results from paired *t* tests for comparing evaluative and desirability valuation of emotion categories for Study 3. A significant interaction showed that the valuation of emotion depended on the valuation dimension and emotion category in question.
* $p < .05$. ** $p < .01$. *** $p < .001$.

### *Contributions of Valence-Related Dimensions in Predicting Beliefs About Daily Emotional Experience*

The findings thus far indicate that the evaluative, hedonic, and desirability dimensions serve as distinct dimensions of emotion valuation. Next, we examined how these three dimensions relate with each other in predicting beliefs about the frequency of emotional experience. Specifically, we evaluated the novel theoretical model that evaluative and hedonic dimensions of emotion predict the desirability to experience an emotion, which in turn predicts the frequency of emotional experience. We first used mediation models as depicted in Figure 6 and outlined in Table 5 to specifically test whether any observed direct relationships of evaluative and hedonic pathways on beliefs about emotion frequency are mediated by desirability. The direct pathway $c_e$, from the evaluation of a certain emotion to the reported frequency of the emotion, was significant for 11 of 13 emotions tested. However, this pathway was also consistently mediated by the desire to experience the emotion. Significant mediation was observed when testing the *ab* pathway for each emotion category in each case as shown by the confidence intervals. Full mediation was observed for

**Figure 7**

*Differences in the Covariance Structure for Evaluative and Desirability Dimensions of Emotion Valuation, Study 3*




*Note.* The diagonal presents the correlations between evaluative and desirability ratings. The off-diagonal presents comparisons of correlations using Steiger's test. Scores shaded in gray are significant at $p < .01$ level, and scores shaded in black are significant at $p < .05$, Bonferroni-corrected for multiple comparisons. The many significant differences between the amount of shared variance of the hedonic and evaluative emotion valuations are consistent with the hypothesis that evaluative and hedonic dimensions of emotion make distinct contributions to emotion valuation depending on the emotion in question. See the online article for the color version of this figure.

8 of 13 emotions such that the pathway $c_e'$ was nonsignificant upon including the mediation through desirability in the model. A parallel set of mediation analyses for the hedonic dimension showed, first, that desirability mediated the relationship between the hedonic dimension and emotion frequency for all emotions, with full mediation for 12 of 13 emotions tests.

Next, we conducted path analyses for each emotion to test the contribution of the evaluative to desired pathway when simultaneously including the hedonic to desirability pathway in the model. For all models, comparative fit index indicated good fits (comparative fit index > .95), Tucker–Lewis index indicated good model fits for 11 emotions (Tucker–Lewis index > .95) and

**Table 5**
*Direct and Indirect Effects of Evaluative and Hedonic Dimensions on Emotion Frequency*

| | Evaluative | | | | | | | Hedonic | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Emotion | *a* | *b* | *c′* | *c* | *ab* | *ciLB* | *ciUB* | *a* | *b* | *c′* | *c* | *ab* | *ciLB* | *ciUB* |
| Shame | 0.61*** | 0.58*** | 0.21** | 0.57*** | 0.35 | 0.18 | 0.56 | 0.85*** | 0.73*** | −0.02 | 0.60*** | 0.61 | 0.48 | 0.76 |
| Fear | 0.67*** | 0.72*** | 0.05 | 0.49*** | 0.44 | 0.26 | 0.61 | 0.89*** | 0.65*** | 0.05 | 0.62*** | 0.58 | 0.38 | 0.75 |
| Calm | 0.65*** | 0.45*** | 0.09 | 0.38*** | 0.29 | 0.16 | 0.44 | 0.62*** | 0.38*** | 0.20* | 0.44*** | 0.24 | 0.10 | 0.39 |
| Jealousy | 0.75*** | 0.61*** | 0.1 | 0.56*** | 0.46 | 0.30 | 0.67 | 0.82*** | 0.59*** | 0.12 | 0.60*** | 0.48 | 0.30 | 0.71 |
| Miserable | 0.91*** | 0.74*** | −0.046 | 0.62*** | 0.67 | 0.47 | 0.85 | 0.88*** | 0.72*** | −0.03 | 0.61*** | 0.64 | 0.46 | 0.78 |
| Lust | 0.73*** | 0.82*** | −0.11 | 0.48*** | 0.60 | 0.48 | 0.74 | 0.46*** | 0.70*** | 0.08 | 0.39*** | 0.32 | 0.22 | 0.42 |
| Disgust | 0.65*** | 0.62*** | 0.19** | 0.60*** | 0.40 | 0.24 | 0.58 | 0.83*** | 0.60*** | 0.17 | 0.67*** | 0.50 | 0.31 | 0.68 |
| Guilt | 0.55*** | 0.66*** | 0.03 | 0.40*** | 0.36 | 0.20 | 0.54 | 0.78*** | 0.69*** | −0.01 | 0.53*** | 0.54 | 0.39 | 0.71 |
| Happy | 0.38*** | 0.40*** | −0.06 | 0.1 | 0.15 | 0.08 | 0.24 | 0.45*** | 0.44*** | −0.12 | 0.07 | 0.20 | 0.11 | 0.29 |
| Love | 0.58*** | 0.36*** | −0.06 | 0.15 | 0.21 | 0.10 | 0.36 | 0.56*** | 0.39*** | −0.12 | 0.10 | 0.22 | 0.11 | 0.37 |
| Pride | 0.66*** | 0.53*** | −0.01 | 0.34*** | 0.35 | 0.20 | 0.52 | 0.60*** | 0.61*** | −0.15 | 0.22** | 0.36 | 0.22 | 0.52 |
| Excitement | 0.59*** | 0.59*** | −0.09 | 0.25** | 0.35 | 0.23 | 0.47 | 0.45*** | 0.58*** | −0.12 | 0.14 | 0.26 | 0.17 | 0.37 |
| Sadness | 0.68*** | 0.39*** | 0.21* | 0.48*** | 0.27 | 0.07 | 0.44 | 0.86*** | 0.44*** | 0.12 | 0.49*** | 0.37 | 0.03 | 0.64 |

*Note*. The table presents coefficients from the mediation models for each emotion category. Our model suggests that the evaluative dimension influences the desire to experience an emotion, which influences the reported frequency of emotion (see Figure 2). The direct pathway *c*, from evaluative to emotion frequency, was significant for several emotion categories. This pathway was mediated through desirability when examining the *ab* pathway with upper and lower 95% confidence intervals, *ciLB* and *ciUB*, respectively. Full mediation was observed for several emotions insofar as the direct pathway was no longer significant when the mediation pathway was included in the model, that is, *c′*. Parallel mediation analyses were performed for the hedonic dimension.
* $p < .05$. ** $p < .01$. *** $p < .001$.

acceptable model fits for the remaining two emotions (Tucker–Lewis index > .90), finally chi-square tests indicated good model fits for nine emotions ($p > .05$) and poor fits for four emotions ($p < .05$). All model fit statistics are reported in Supplemental Table S5, Model 1. As presented in Supplemental Figure S5, the evaluative to desired pathway was significant for several emotions including miserable, excitement, pride, calm and love (lower bound of 95% confidence intervals from highest posterior density >0; all βs > .30, all *p*s < .001). Further attesting to the independence of hedonic and evaluative dimensions, the hedonic pathway was significant for several emotions that were also significant for the evaluative pathway including miserable, pride, calm, love, and jealousy, suggesting that they made distinct contributions. The hedonic pathway was also significant for several emotions that the evaluative pathway did not contribute to, including happy, guilt, shame, disgust, and fear, and for emotions including lust and excitement that the evaluative pathway did contribute to. Finally, the desired to emotion frequency pathway was significant for all emotions (all lower bounds of 95% confidence intervals > 0; all βs > .35, all *p*s < .01). In combination with the mediation analyses, the path models are consistent with the overarching notion that evaluative and hedonic dimensions influence desired emotional states, which in turn contributes to the reported frequency of emotional experience, and that the strength of these relationships depends on the emotion category in question. Finally, we compared this model with an alternative model wherein we swapped frequency and desirability. The former model outperformed this latter model for every emotion category (see Supplemental Table S4).

## Discussion

The results of Study 3 indicate that the hedonic, evaluative, and desirability dimensions each contribute unique variance to valence dimensions of emotion valuation. Importantly, their empirical separability strongly depends on the emotion category in question. If we examined only the correlation across emotion categories of averaged evaluative ratings and desirability ratings, we might prematurely conclude that there is no empirical evidence for their separation since the Pearson correlation was nearly perfect ($r$ = .995). However, an examination of mean differences and correlational differences across individuals showed that these dimensions are separable when taking into account emotion category. In particular, participants in Study 3 evaluated excitement, happiness, and guilt, as more good than necessarily desired emotion states. Correlational data showed that evaluative and desired ratings correlated positively for many emotion categories; however, only approximately 50% of the variance was shared, and the Pearson correlation values were significantly less strongly correlated for these emotion categories relative to others (e.g., in comparison to misery, jealousy, and calm).

We further examined how well our integration of affect valuation theory with VBDM models would account for the organization of these valuation dimensions in predicting beliefs about the frequency of discrete emotions. Affect valuation theory proposes that the emotions that people experience in everyday life are shaped by both hedonic beliefs and evaluations of emotion categories, which has been examined using cross-cultural study designs (but see Sims et al., 2015, for an experimental approach). The valuation of emotion categories has also been shown to be multidimensional (Tamir, 2016). Here, our findings contribute to this literature in two key ways. First, we provide a more detailed examination of how three dimensions of emotion valuation contribute to several emotion categories. Second, we combine affect valuation theory with a VBDM model, in general, to hypothesize a particular way in which information from these dimensions may converge. Specifically, our findings are consistent with a model wherein hedonic and evaluative dimensions contribute to the desire to experience certain emotions, which in turn predicts the self-reported frequency of certain emotion categories.

## General Discussion

Prior theory and research in affective science suggest that people place value judgments on emotions in terms of how pleasant, good, and desired they are (Parrott, 1993; Tomkins, 1962, 1963; Tsai, 2007; Tamir, 2016). Cultural and religious institutions, for example, suggest that certain emotions, such as lust or pride, are bad regardless of whether they are pleasant (and regardless of their functional utility; Erber & Erber, 2000; Regnerus, 2007; Solomon, 2008). Here, we examined how emotion valuation for all three valence-related dimensions relate to one another across a variety of emotion categories. We found that the mean evaluative, hedonic, and desirability ratings of emotion categories differed from one another depending on the emotion category in question. We also found that correlational dependencies between the evaluative, hedonic, and desirability ratings of emotion categories also varied by emotion categories. Evaluative and hedonic ratings of emotion categories also interacted with Asian American and Caucasian American cultural background. Finally, path analyses supported a model wherein evaluative and hedonic dimensions both drive desirability of emotions, which in turn predicts emotion frequency.

### Evaluative and Hedonic Dimensions of Emotion Categories

A key aim of this study was to investigate how evaluative and hedonic valuations vary by emotion category. Figure 5 provides combined data and measures across studies to provide an integrative summary. Emotion categories positioned in the top right quadrant are those for which evaluative and hedonic dimensions provide more distinct sources of information (i.e., high mean difference and high dissimilarity in terms of low covariance). Markers with vertical line textures signify emotion categories showing culture by valuation dimension interactions. Emotion categories that show greater differentiation of hedonic and evaluative dimensions include guilt, anger, shame, sadness, lust, and fear. In contrast, hedonic and evaluative dimensions provided more redundant information for other emotion categories including miserable, joy, jealousy, awe, distressed, and happiness.

There was a noticeable level of convergence across the three independent sources of information. Greater mean differences in valuation tracked with greater dissimilarity scores. Emotion categories with culturally dependent valuations were also among the upper right quadrant (vertical line textures), whereas those that did not show a culturally dependent interaction with valuation effect were in the lower left quadrant (dotted textures; nontextured markers denote emotions that were not included in Study 2). Many hedonically negative emotion categories (e.g., guilt, anger, shame, fear, sadness, disgust), had relatively more positive evaluative ratings. The positive evaluation of certain negative emotion categories—that is, seeing the good in shame, guilt, or fear—may have beneficial effects for health and well-being (Luong et al., 2016; Miyamoto et al., 2014; Willroth et al., 2023). Yet, there were also differences among hedonically positive emotion categories including love, pride, and lust. In our PCA, we found that the positive evaluation of these emotion categories loaded onto two distinct components. Component 3 included the positive evaluation of fear, anger, sadness, and lust. Component 4 captured variation in the positive evaluation of love and calmness and the negative evaluation of shame, guilt, and pride. These findings suggest that there are potentially different underlying reasons as to why people evaluate certain emotion categories as good. It would be interesting to relate these distinct components to measures of mental health and well-being in future work.

### Integrating Evaluative, Hedonic, and Desirability Dimensions in Predicting Emotion Frequency

We also examined how emotion valuation along all three valence-related dimensions predicts people's beliefs about how often they feel certain emotions in everyday life. According to affect valuation theory (Tsai, 2007), a valuation process predicts whether people do or do not pursue the emotional states that they ideally want or desire to feel, referred to as "ideal affect." Desired emotional states are driven by the hedonic feelings that accompany emotions and also by the norms and beliefs about emotions. Consistent with this model, we performed a combination of path and mediation analyses and found that the reported frequency of several emotional experiences was proximally driven by a person's desired emotional states, which in turn was informed by both hedonic and evaluative dimensions of emotion.

To be sure, our measure assesses beliefs about the occurrence of certain emotions in everyday life but not the actual frequency of emotions. The gold standard methodology for examining the actual frequency of daily emotional experiences is to use experience sampling methods (Barrett & Barrett, 2001; Larson & Csikszentmihalyi, 2014). The retrospective measures we used, while also used in prior studies (e.g., Tsai, 2007; Tsai et al., 2006), are differentially influenced by schematic in comparison to in-the-moment assessments of emotional experience (Robinson & Clore, 2002; Thomas & Diener, 1990). Indeed, one previous study found that the desirability ratings of emotional states correlated with retrospective assessments of emotion frequency but not with experience sampling measures (Scollon et al., 2009). However, other work using experience sampling methods has shown that reduced negative evaluations toward negative emotion categories were also associated with greater likelihood of experiencing mixed emotions in daily life (Sims et al., 2015), suggesting that desirability might, in fact, shape how people experience emotions. It would be important to measure emotion frequency using experience sampling methods to test how evaluative valuations of emotions influence frequency of emotion experience more directly.

Nevertheless, retrospective judgments about emotions (Robinson & Clore, 2002; Thomas & Diener, 1990) also play an important role in everyday life such as when discussing our emotional lives with others (friends, family, clinicians, etc.) or when providing public testimonies about autobiographical events. Here, our results suggest that a person's evaluative beliefs about emotion relates with how people recount their emotional lives, at least in terms of the frequency of emotion experiences.

### Cultural Background and Emotion Valuation

Norms and beliefs about emotions are transmitted through culture and developmental upbringing (Oishi et al., 2013; Tsai, 2007). Prior work has shown that Eastern Asian participants, on average, desire to feel low-arousal positive emotions more than high-arousal positive emotions (Tsai et al., 2006) and have more favorable attitudes toward negative emotions (Sims et al., 2015). Parental

attitudes toward emotions also predict how children experience and regulate emotions (Rogers et al., 2016). Our findings from Study 2 show that cultural background predicts both overall emotion valuation but also differentially interacts with hedonic and evaluative valuation dimensions. When averaging across hedonic and evaluative dimensions, Asian American participants had a less negative valuation of all negative valence emotions. The greater acceptance of certain negative emotions among Asian American participants dovetails with findings from several prior studies (Miyamoto et al., 2014; Sims et al., 2015; Tsai, 2007; Uchida & Kitayama, 2009). Interestingly, there was also a valence divide for pride and lust across groups. Asian Americans rated pride and lust as negative overall, whereas Caucasian Americans rated both as more positive on average.

However, and critically for the goals of our study, we also observed that the role of cultural background in emotion valuation also depended on the dimension and emotion in question. As shown in Table 3, the difference between Asian American and Caucasian American participants was more pronounced when evaluating ratings of negative emotions for their goodness than when asked to rate them on hedonic pleasantness. This finding is consistent with the idea that evaluative beliefs about emotion are informed by cultural background (Miyamoto et al., 2014; Tsai, 2007; Uchida & Kitayama, 2009).

## Constraints on Generalization

Our study only sampled three valence-related valuation dimensions. Importantly, some beliefs about emotion are not necessarily valence-related. The functional utility of an emotion (Tamir, 2016), for example, concerns not so much whether an emotion is evaluatively good or bad based on religious or cultural beliefs but, rather, whether experiencing a certain emotion has utility to accomplish a particular goal in a particular situation. Feeling anger, for example, may facilitate behavioral performance on a confrontational task but not on a nonconfrontational task, which makes anger useful regardless of its valence (Tamir et al., 2008). Future work may examine how the dimensions studied here relate with the functional utility of emotion categories and how these valuations may change based on motivational or situational factors.

Finally, there are constraints on generalization to our samples in Study 2. Our online samples included participants who were born in the United States or immigrated prior to the age of 12, which may lead to more similarity in values among Asian American and Caucasian American participants than sampling participants from different countries. We nonetheless observed significant culturally dependent effects in Study 2, underscoring the importance of culture in understanding emotion valuation.

## Future Directions

An understanding of emotion valuation may have implications for emotion experience. Chim et al. (2018) found that the desire to experience specific emotions, like calmness, can enhance their enjoyment. However, further research is needed to understand how other valuation dimensions, such as the evaluative dimension, may also play a role. Some interesting cases include sadness, which had a higher evaluative than hedonic rating across studies, a trend more pronounced among Asian American participants, and lust, which was consistently rated more pleasant than good, consistent with a "forbidden fruit"-like valuation pattern (Regnerus, 2007). Discrepancies between evaluative and hedonic valuations may be particularly interesting cases to examine how valuation influences experience.

Recent theoretical models (Gross, 2015; Ochsner & Gross, 2014; Sheppes et al., 2014) have also proposed that emotion regulation is deployed after a valuation process in which the emotional state is judged as "to be regulated" rather than just experienced. Our path models provide support for these views. As one example, the evaluation of lust predicted the self-reported frequency of feeling lust in everyday life, even upon controlling for hedonic and ideal affect measures, suggesting that the evaluation of lust plays a unique role in regulating lust. Correspondingly, our findings suggest that differences in valuation along these dimensions may predict both the likelihood to self-initiate emotion regulation for lust, or other emotions, and whether there is conflict when doing so.

## Conclusions

The present set of studies contributes to a growing body of work examining the valuation of emotion categories and how they relate to the antecedents of emotion, the regulation of emotion, and individual and cultural variation in what it feels like to experience certain emotions (Ford & Gross, 2019; Tamir, 2016; Tsai, 2007). Across four data sets, we examined how the relationships between three valuation dimensions—evaluative, hedonic, and desirability—vary across emotion categories and depend on cultural background and how they combine in predicting retrospective assessments of the frequency of experienced emotions. The findings are consistent with a proposed VBDM approach, wherein evaluative and hedonic dimensions contribute to the desire to feel certain emotions, which in turn predicts the frequency of experienced emotions in everyday life.

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