

Supplemental Materials

Details on Inclusion and Exclusion Criteria

Several attention checks were incorporated into both the dimensional and categorical surveys to identify inattentive participants. After explicitly indicating that they had read all instructions carefully (via a button press), participants were asked to reiterate in their own words the general task they would be completing in the survey (e.g., “providing ratings of emotional response to imagined scenarios”). We flagged participants who were unable to provide a coherent or correct answer to this free-response question. Additionally, at the end of the ratings task we asked participants to respond in a specific manner to an attention-check scenario which consisted of two sentences providing instructions for how to respond. For the category survey, participants were instructed to select the Reading option among the category labels and provide a rating of 7 on a slider scale. For the dimension survey, participants were instructed to provide a rating of 5 for all dimensional appraisals, except for the Reading rating, which required a rating of 9. Note that in both surveys, the Reading option was only included in the final attention check and not provided for the actual stimuli. Finally, to maintain data quality throughout the course of data collection and curb against rising exclusion rates, several surveys included an additional attention check at the end of the survey where participants were again prompted to reiterate the task that they had just completed (via free response). As before, we flagged participants if they were unable to provide a coherent and appropriate response to this question.

When collecting data from online participants, researchers should be wary of bot or farming responders who have become sophisticated in avoiding detection (Kennedy et al., 2020). Incorporating free response attention checks in combination with specific selection attention checks are suggested to best catch these responders. Per the guidelines of Chmielewski &

Kucker (2020), we used a two-tier screening approach by first rejecting obvious bots/farmers that failed multiple attention checks throughout the survey, and then approving submissions but excluding from analysis those that were less obvious (e.g., only missing one attention check). In the current study, submissions were rejected and republished if participants provided an incoherent or incorrect response to the first attention check (reiterate survey instructions) and failed the attention check scenario and/or also failed the final question asking them to provide a description of the task they had just completed (when applicable, as only later surveys also included this additional free response attention check). Failing multiple checks indicated that the participant did not read the instructions of the survey or read the scenarios properly. We also rejected participants who did not complete the ratings survey and submitted an incorrect completion code on Mechanical Turk.

Furthermore, we excluded participants who honestly indicated that they had difficulty paying attention to the survey. That is, at the very end of the survey we asked participants if they were “paying attention, avoided distractions, and took this survey seriously”, for which we only included in analyses those who selected the “Yes” response and excluded those who selected “No, I was distracted,” “No, I had trouble paying attention,” “No, I did not take the survey seriously,” or “No, something else affected my participation negatively.” We ensured participants that this response would not affect their payment or eligibility for future studies, as responses to this question were only used for data exclusions and not for rejecting submissions. Finally, for the dimension survey, we applied an additional exclusion criterion prior to analysis to remove participants with a tendency to straight-line their ratings across the 14 available dimensions (Kim et al., 2019). Participants were excluded from analysis if they responded with a

standard deviation less than 1 (effectively choosing a range of only 2 options across all ratings) on 90% or more of the scenarios they rated (i.e., on at least 27/30 scenarios).

References

- Chmielewski, M., & Kucker, S. C. (2020). An MTurk Crisis? Shifts in Data Quality and the Impact on Study Results. *Social Psychological and Personality Science, 11*(4).
<https://doi.org/10.1177/1948550619875149>
- Kennedy, R., Clifford, S., Burleigh, T., Waggoner, P. D., Jewell, R., & Winter, N. J. G. (2020). The shape of and solutions to the MTurk quality crisis. *Political Science Research and Methods, 8*(4). <https://doi.org/10.1017/psrm.2020.6>
- Kim, Y., Dykema, J., Stevenson, J., Black, P., & Moberg, D. P. (2019). Straightlining: Overview of Measurement, Comparison of Indicators, and Effects in Mail–Web Mixed-Mode Surveys. *Social Science Computer Review, 37*(2).
<https://doi.org/10.1177/0894439317752406>

Introduction and Consent

Instructions

Attention Check

Ratings Task (Categorical or Dimensional)

Attention Check

Demographics

Imagine the following scenario (1 of 31):

You decide to eat an apple. After taking a bite, you notice worms are crawling inside.

Please choose at least one of the options below to describe the emotion you feel when imagining this scenario. You may choose multiple emotions.

- Admiration
- Sympathy
- Anxiety
- Awe
- Empathic pain
- Anger
- Triumph
- Disgust
- Adoration
- Satisfaction
- Pride

Imagine the following scenario (1 of 31):

You just finished an important performance. The audience is cheering for you in the auditorium.

To what extent does this make you feel a sense of safety?

Very Unsafe					Neutral					Very Safe
1	2	3	4	5	6	7	8	9		

Response:

To what extent does this make you feel like imagining this demands effort?

No Effort whatsoever					Neutral					Enormous Effort
1	2	3	4	5	6	7	8	9		

Response:

To what extent does this make you feel focused?

More Unfocused					Neutral					More Focused
1	2	3	4	5	6	7	8	9		

Response:

To what extent does this make you feel like things are fair?

Sense of Unfairness					Neutral					Sense of Fairness
1	2	3	4	5	6	7	8	9		

Response:

To what extent does this make you feel pleasant?

Very Unpleasant					Neutral					Very Pleasant
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Figure S1. Overview of the online rating task. Each participant completed either a categorical (top) or dimensional (bottom) survey in response to 30 imaginative scenarios (plus one attention check scenario). Only the top of the window is displayed for each example in the figure above (participants scrolled down to view more category options or dimensional ratings). On the instructions screen, participants were told *“You will be asked to read a series of two-sentence scenarios. Try to imagine each scenario in as much detail as possible and think about how it would make you feel if it were to actually occur to you. As you imagine the scenario, focus on that feeling and how you would describe it.”* For the category judgments, participants were asked to *“please choose at least one emotion from the list of options provided that best describes the emotion you feel when imagining the scenario that is displayed on the screen. You may choose more than one emotion.”* Participants were allowed to select from 34 category labels. Subsequently, participants rated the degree to which they experienced the selected emotions (not shown; see Figure S2). For the dimensional ratings, participants rated 14 different dimensional attributes for each scenario (randomly ordered for each participant). Participants were asked to *“please describe the emotion you feel when imagining the scenario that is displayed on the screen by providing ratings on various scales.”* During both survey types, the scenario always stayed as a banner at the top of the screen while participants chose category labels or rated the dimensional scales.

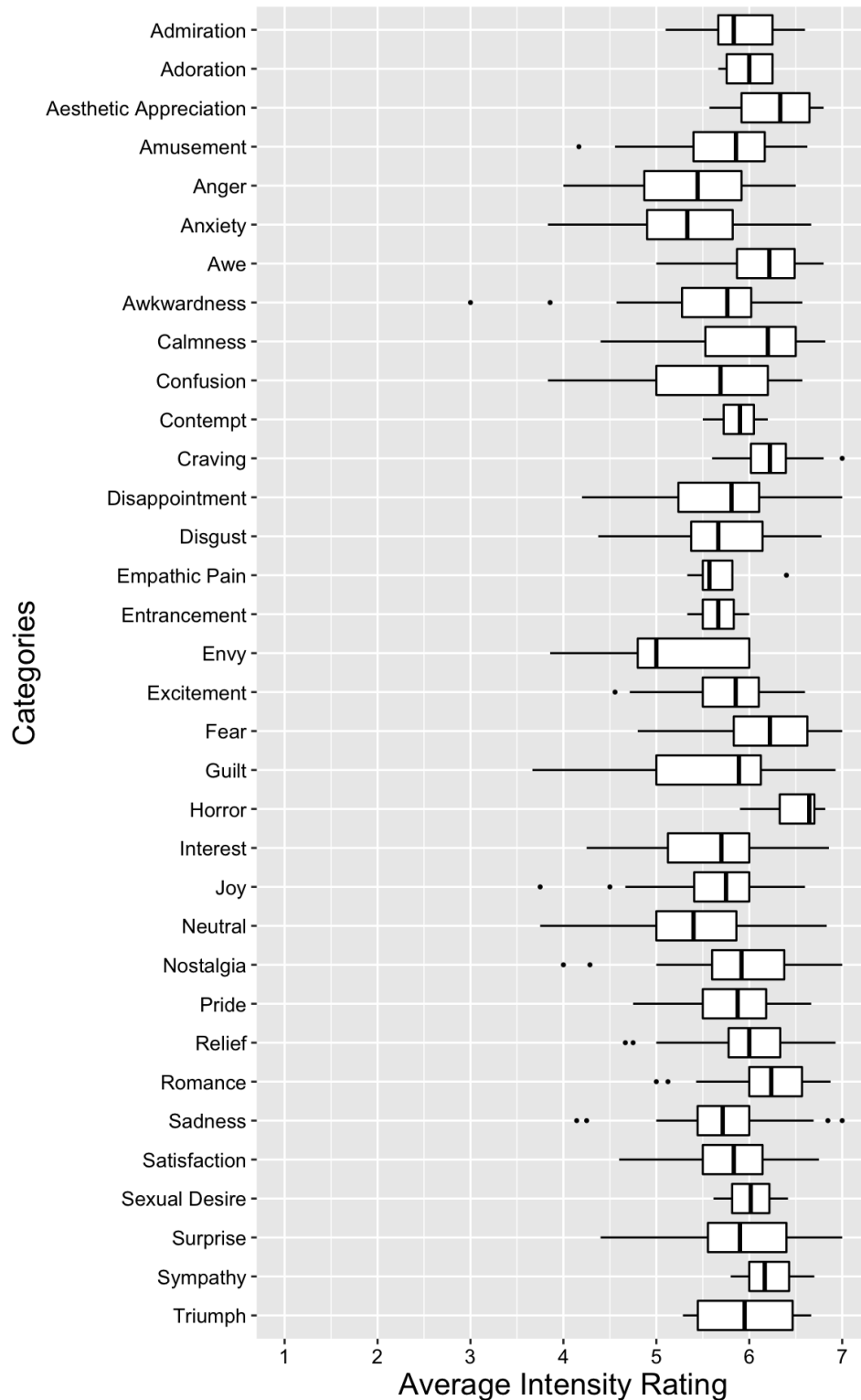


Figure S2. Average intensity ratings for categories that were maximally endorsed. After making category judgements, participants were asked to rate the degree to which they felt the selected category (or categories) on a scale of 1 (“Not At All”) to 7 (“Very Strongly”). For each scenario, we calculated the average intensity value across all raters for the category (or categories) with the highest concordance rate, and then plotted these metrics as boxplots.

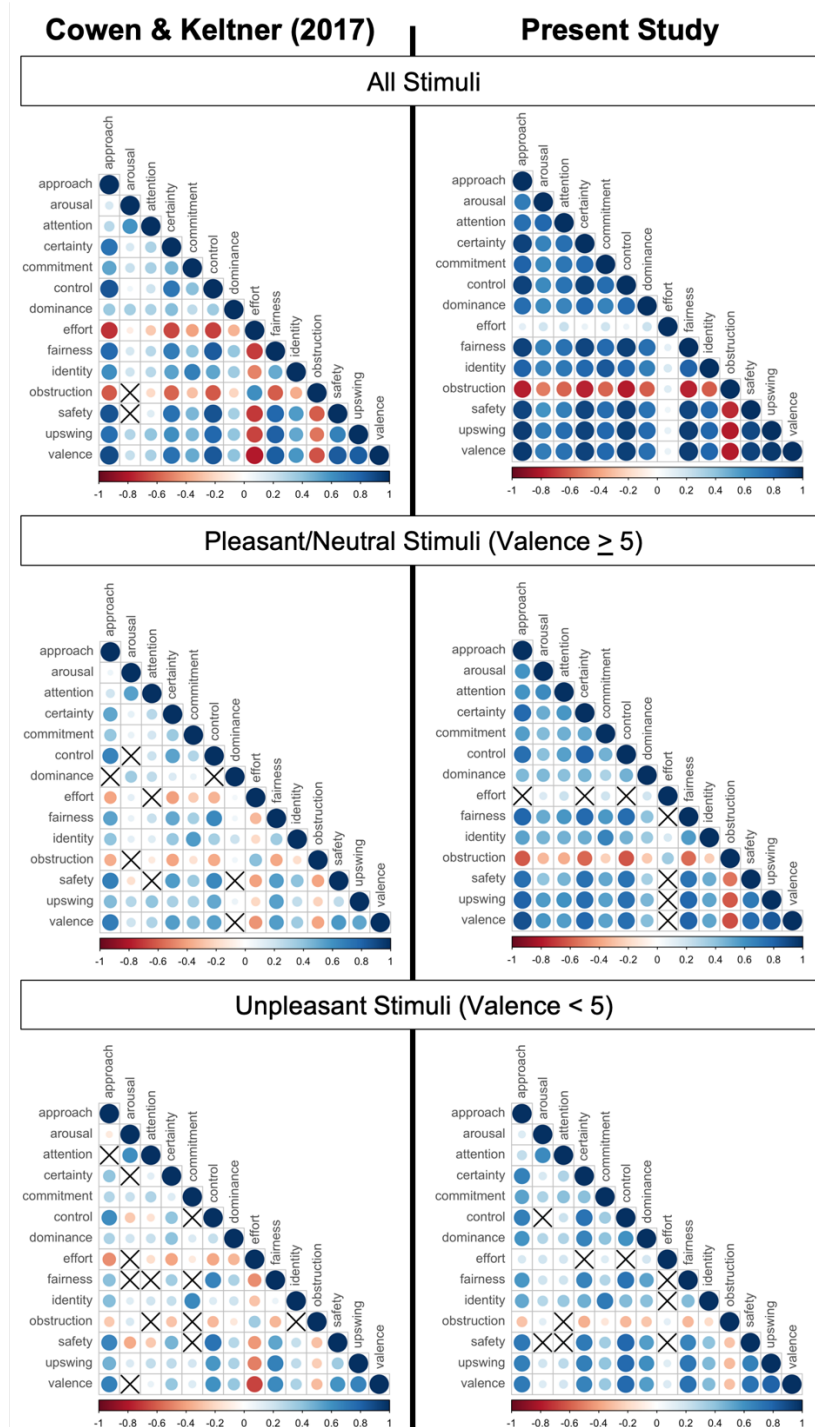


Figure S3. Correlations among the dimensional ratings obtained from hypothetical scenarios (Present Study) and video stimuli (Cowen & Keltner, 2017). Correlations marked with “X” are insignificant at a threshold of $p < .05$ (uncorrected for multiple comparisons). Correlations are shown for all stimuli (top), only pleasant/neutral stimuli (middle), and only unpleasant stimuli (bottom). Note the similar correlational structure across the two studies, with the exception of arousal, attention, dominance, and effort dimensions.

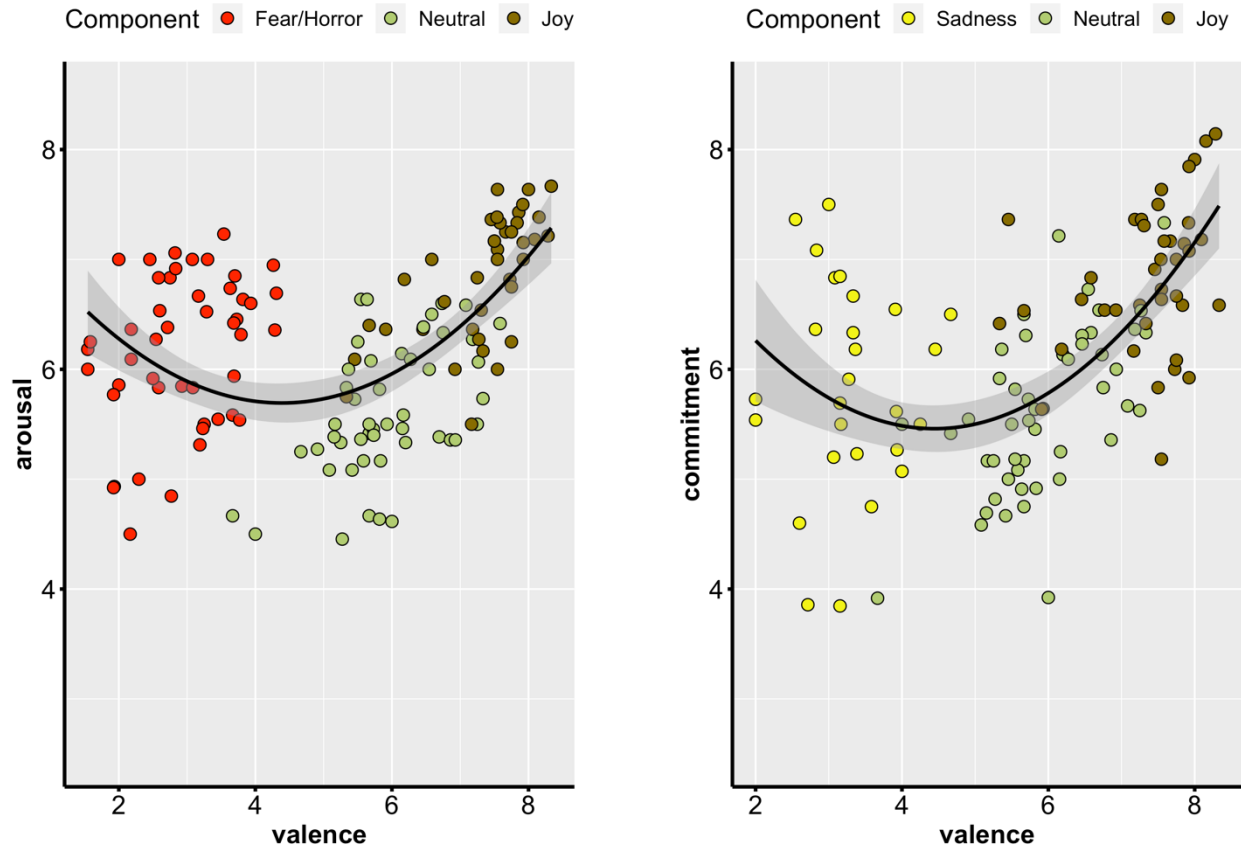


Figure S4. Examples of nonlinear trends in the data. Although dimensions were correlated with one another, associations among dimensional appraisals such as valence and arousal (left) or valence and commitment (right) exhibit nonlinear relations when assessed among a subset of the stimuli (grouped by component assignment from the principal component analysis). These nonlinear trends reflect deviations from the linear associations observed in *Figure S3*, demonstrating unique variance in categorical structure that cannot be explained by valence alone. These deviations are similarly reflected in the canonical correlation analysis. The fear/horror component, for instance, loads strongly onto the second canonical variate, which associates with variance in arousal and safety ratings. Likewise, sadness loads strongly onto the third canonical variate, which associates with variance in commitment and fairness ratings. Trend lines show the fitted quadratic regression (left: $F_{2,133} = 26.52, p < .001$; right: $F_{2,113} = 31.17, p < .001$).

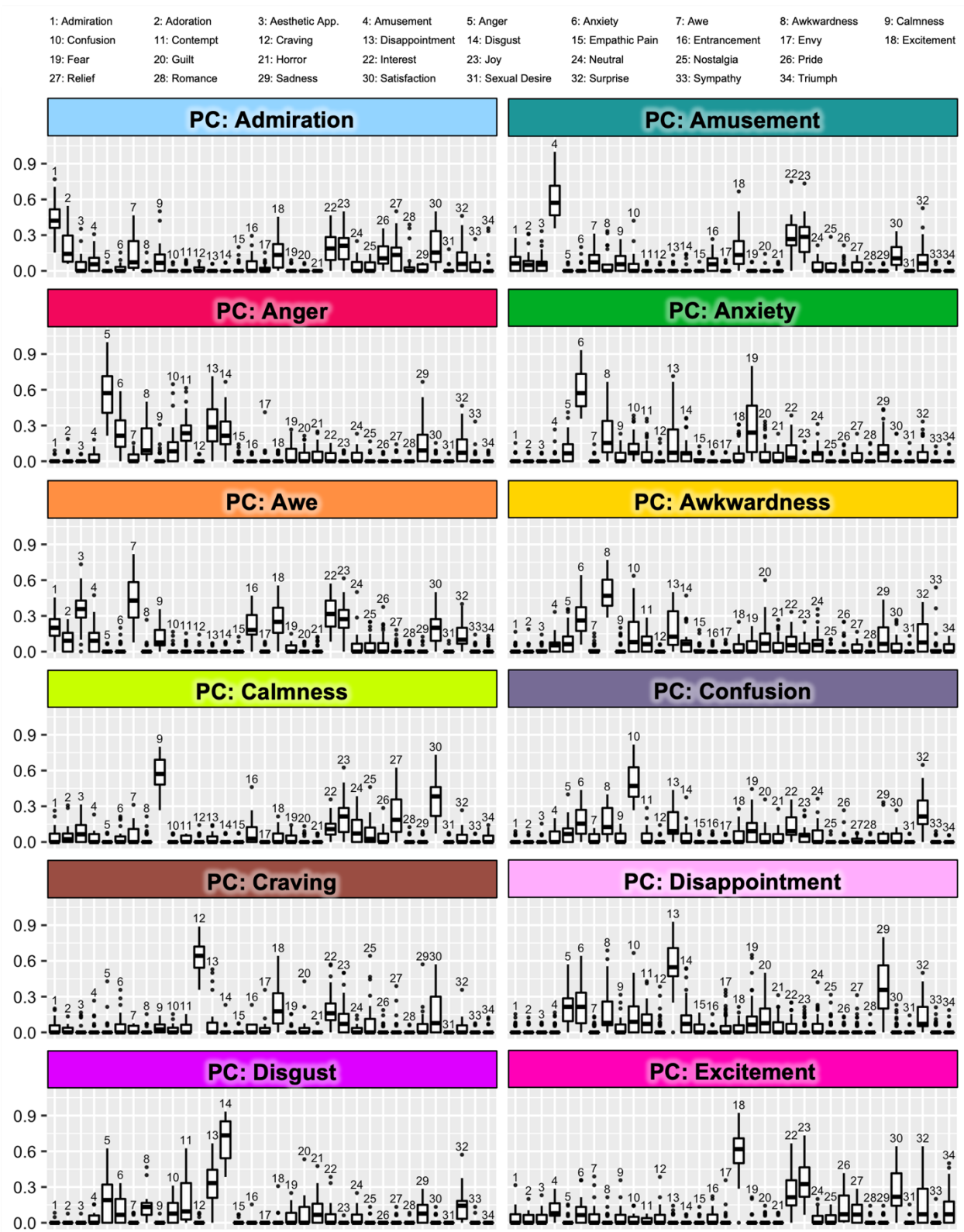


Figure S5. Boxplots of concordance rates grouped by principal component assignment from the PCA.

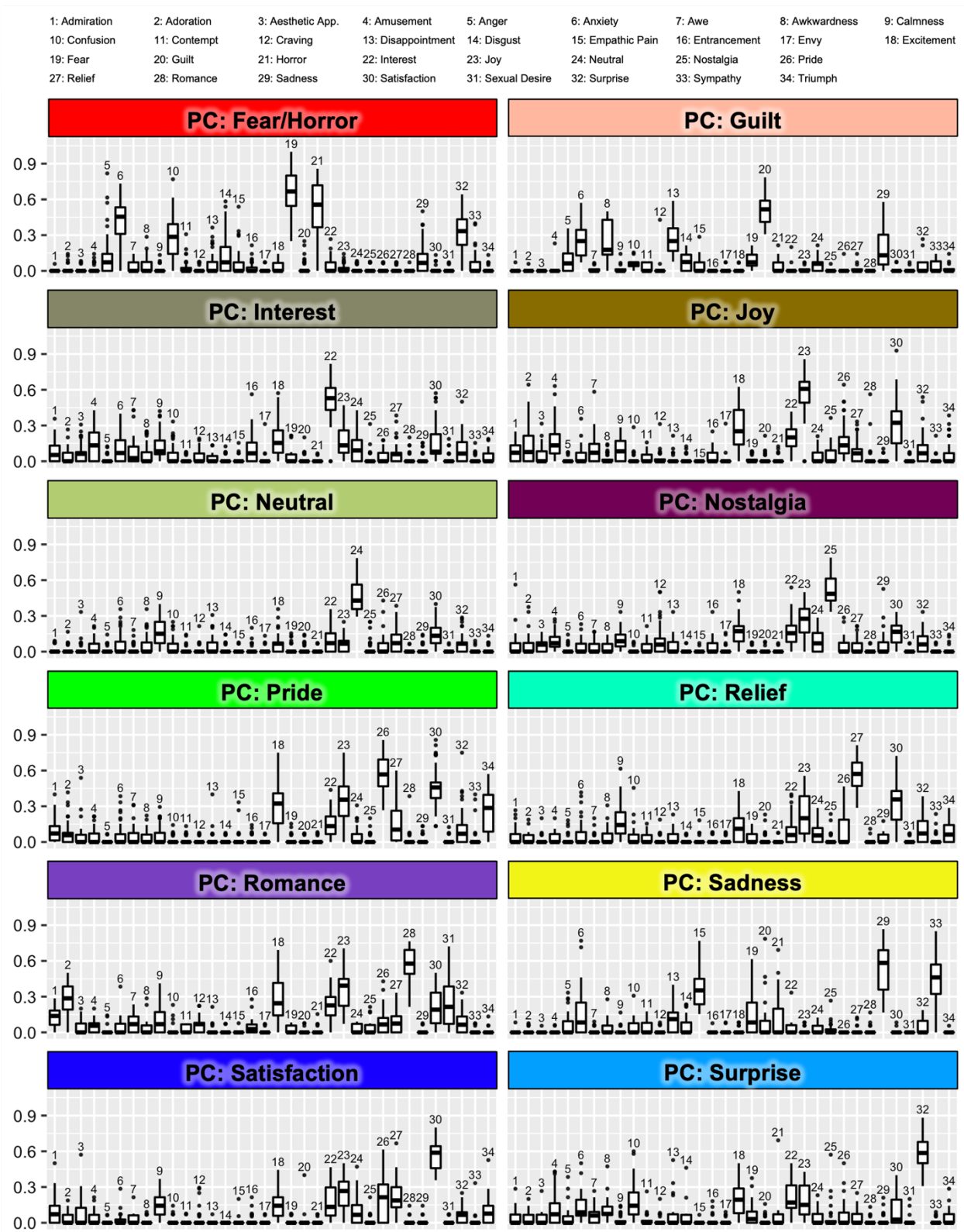


Figure S5 (continued). Boxplots of concordance rates grouped by principal component assignment from the PCA.

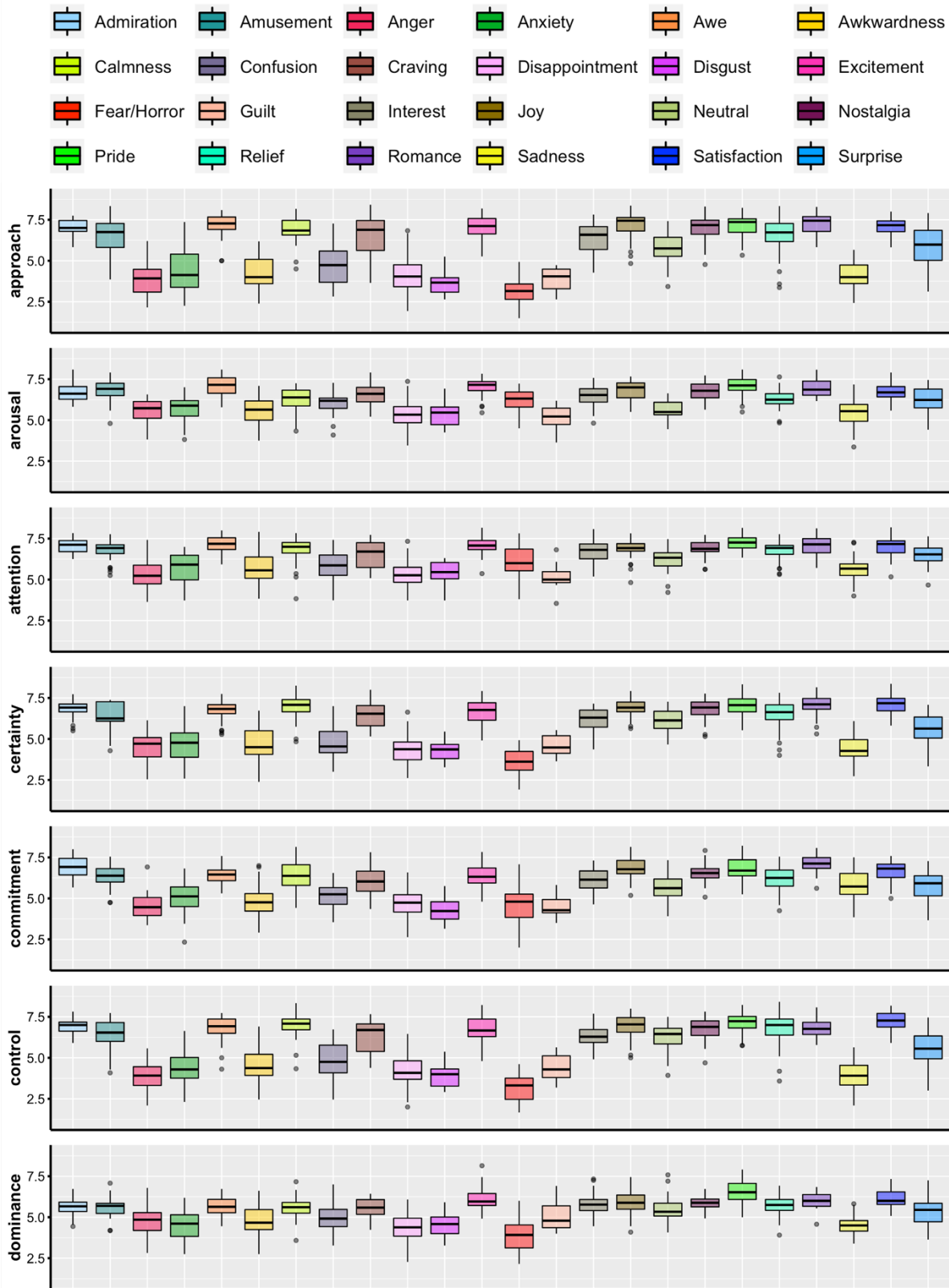


Figure S6. Boxplots of dimensional ratings for all 24 components.

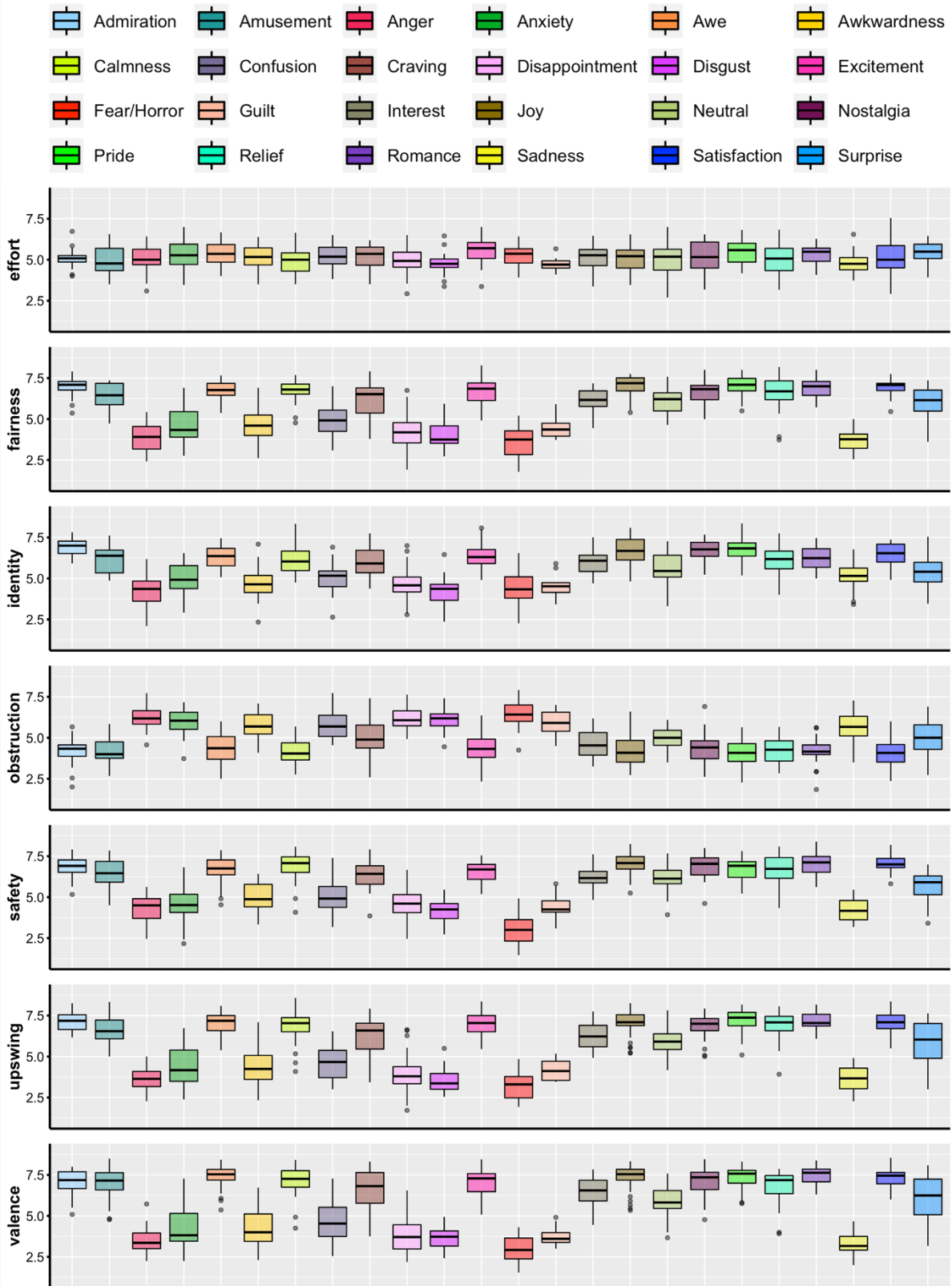


Figure S6 (continued). Boxplots of dimensional ratings for all 24 components.

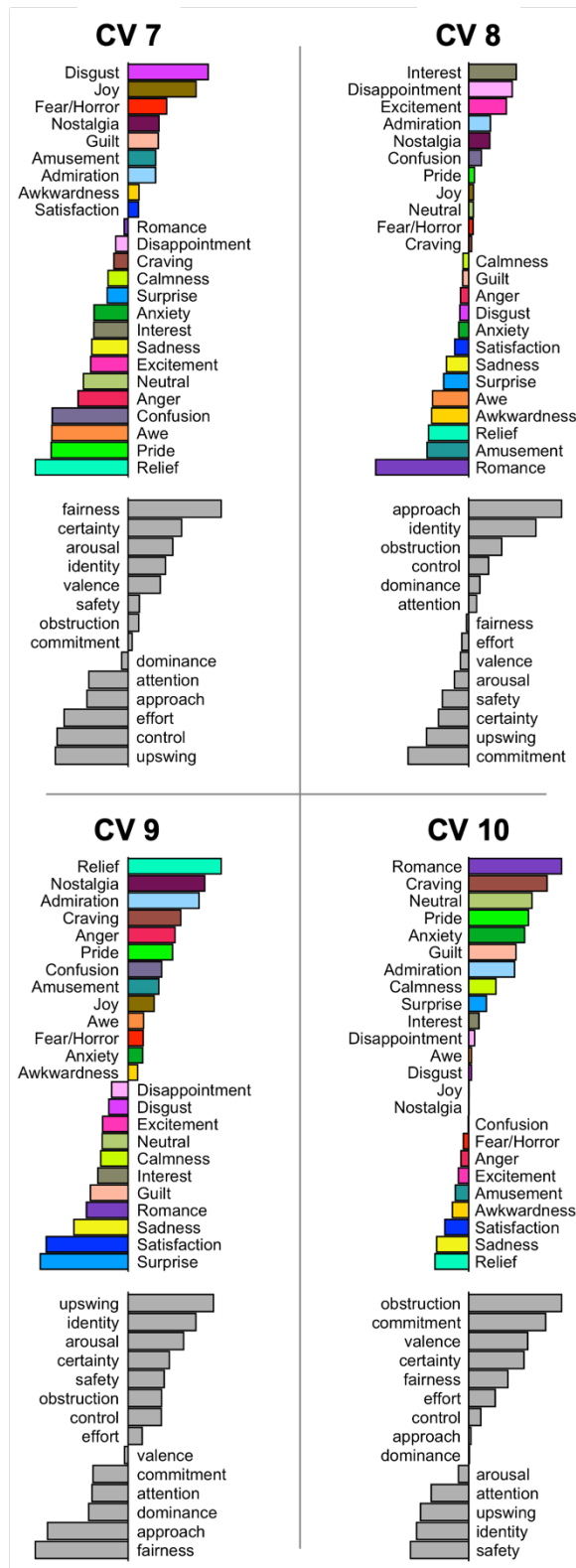


Figure S7. Canonical variates 7-10 that exhibited significant canonical correlations between the categorical and dimensional data.

Table S1. Categorical labels and dimensional appraisals assessed in the online surveys (adapted from Cowen & Keltner, 2017).

Categories (choose one or more)		Dimensions (1-9, “Neutral” at midpoint) <i>To what extent does this make you feel...</i>
Admiration	Envy	Approach: <i>like this is something you would want to approach?</i> 1: Desire to Avoid, 9: Desire to Approach
Adoration	Excitement	Arousal: <i>stimulated?</i> 1: More Subdued, 9: More Stimulated
Aesthetic Appreciation	Fear	Attention: <i>focused?</i> 1: More Unfocused, 9: More Focused
Amusement	Guilt	Certainty: <i>certain?</i> 1: Very Uncertain, 9: Very Certain
Anger	Horror	Commitment: <i>a sense of commitment to an individual or creature?</i> 1: Lack of Commitment to an Individual/Creature 9: Strong Commitment to an Individual/Creature
Anxiety	Interest	Control: <i>like things are under control?</i> 1: Things Seem out of Control, 9: Things Seem Under Control
Awe	Joy	Dominance: <i>dominant?</i> 1: More Submissive, 9: More Dominant
Awkwardness	Nostalgia	Effort: <i>like imagining this demands effort?</i> 1: No Effort Whatsoever, 9: Enormous Effort
Neutral	Pride	Fairness: <i>like things are fair?</i> 1: Sense of Unfairness, 9: Sense of Fairness
Calmness	Relief	Identity: <i>like you identify with a group of people?</i> 1: Lack of Group Identity, 9: Strong Group Identity
Confusion	Romance	Obstruction: <i>like you’re obstructed by something?</i> 1: Very Unobstructed, 9: Very Obstructed
Contempt	Sadness	Safety: <i>a sense of safety?</i> 1: Very Unsafe, 9: Very Safe
Craving	Satisfaction	Upswing: <i>like this went better than it first seemed it would?</i> 1: Worse than Expected, 9: Better than Expected
Disappointment	Sexual Desire	Valence: <i>pleasant?</i> 1: Very Unpleasant, 9: Very Pleasant
Disgust	Surprise	
Empathic Pain	Sympathy	
Entrancement	Triumph	

Table S2. Demographic information. Participants classified in the five racial groups are all non-Hispanic or Latino. Participants classified as Hispanic or Latino may identify with any combination of the racial categories.

Demographics	Full Sample	Category Survey	Dimension Survey
N	796	431	365
Age	Mean = 36.8 SD = 10.2	Mean = 37.9 SD = 10.7	Mean = 35.6 SD = 9.4
Gender			
Male	452 (56.8%)	240 (55.7%)	212 (58.1%)
Female	342 (43.0%)	190 (44.1%)	152 (41.6%)
Non-Binary	2 (0.3%)	1 (0.2%)	1 (0.3%)
Race and Ethnicity			
White	616 (77.4%)	343 (79.6%)	273 (74.8%)
Black	69 (8.7%)	35 (8.1%)	34 (9.3%)
Asian	38 (4.8%)	25 (5.8%)	13 (3.6%)
American Indian or Alaska Native	4 (0.5%)	0 (0%)	4 (1.1%)
Two or More Races	19 (2.4%)	12 (2.8%)	7 (1.9%)
Other	1 (0.1%)	1 (0.2%)	0 (0%)
Hispanic or Latino	49 (6.2%)	15 (3.5%)	34 (9.3%)
Education			
Some High School	3 (0.4%)	1 (0.2%)	2 (0.5%)
High School Degree or GED	79 (9.9%)	51 (11.8%)	28 (7.7%)
Some College or University	97 (12.2%)	62 (14.4%)	35 (9.6%)
Associate's Degree	72 (9.0%)	48 (11.1%)	24 (6.6%)
Bachelor's Degree	406 (51.0%)	210 (48.7%)	196 (53.7%)
Some Graduate School	14 (1.8%)	11 (2.6%)	3 (0.8%)
Master's Degree or Equivalent	118 (14.8%)	41 (9.5%)	77 (21.1%)
Doctorate or Equivalent	7 (0.9%)	7 (1.6%)	0 (0%)