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Intersectionality in Emotion Signaling and Recognition: The Influence of Gender, Ethnicity, and Social Class

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Emotional expressions are a language of social interaction. Guided by recent advances in the study of expression and intersectionality, the present investigation examined how gender, ethnicity, and social class influence the signaling and recognition of 34 states in dynamic full-body expressive behavior. One hundred fifty-five Asian, Latinx, and European Americans expressed 34 emotional states with their full bodies. We then gathered 22,174 individual ratings of these expressions. In keeping with recent studies, people can recognize up to 29 full-body multimodal expressions of emotion. Neither gender nor ethnicity influenced the signaling or recognition of emotion, contrary to hypothesis. Social class, however, did have an influence: in keeping with past studies, lower class individuals proved to be more reliable signalers of emotion, and more reliable judges of full body expressions of emotion. Discussion focused on intersectionality and emotion.

Keywords: emotion, expression, multimodal, full body, intersectionality

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Emotional expression is a grammar of social interaction (Eibl-Eibesfeldt, 1989; van Kleef & Côté, 2022). Brief expressions in the face, voice, and body structure interactions between parent and child (Klinnert et al., 1986), friends, potential romantic partners (Gonzaga et al., 2006), people navigating social hierarchies (Tracy et al., 2020), and individuals in collective activities, from ceremonies to watching sports. Emotional expression provides information about the expresser's current feeling, intention, and the present context (see Keltner & Kring, 1998; Scarantino, 2017; van Kleef, 2016). Emotional expressions also coordinate interactions by evoking responses in observers. For example, embarrassment triggers forgiving tendencies (Feinberg et al., 2012), and displays of pride prompt imitation behavior (Martens & Tracy, 2013).

Given the centrality of emotion to social life, emotion scientists have long sought to understand variation in the reliability with which people signal and recognize emotion. Studies have documented the correlates and outcomes related to such variation in studies of: emotional intelligence (Brackett et al., 2011), empathy (Zaki et al., 2009), gender (Hall, 1978), and between and within culture interactions (Elfenbein et al., 2007; Matsumoto et al., 2009). In the present work, we investigate how gender, ethnicity, and social class influence emotion signaling and recognition in the widest array of emotions studied to date.

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Beyond Facial Expressions of Six Emotions: Multimodal, Dynamic Expressions of a High Dimensional Space of Emotion

A first generation of studies of emotional expression focused on how configurations of facial muscle movements signaled six emotions— anger, disgust, fear, happiness, surprise and sadness— most typically portrayed in static photos (i.e., the basic six; Ekman et al., 1969; for review see Elfenbein & Ambady, 2002; Russell, 1994). Since this early work, the study of expression has expanded in significant ways.

A first shift has been to the study of a much wider array of emotional states (e.g., see Cowen & Keltner, 2021; Keltner et al., 2019; Laukka et al., 2014; Sauter et al., 2010). Progress has been made in mapping the expressive behaviors of: self-conscious emotions like embarrassment, shame, and pride (Keltner, 1995; Tracy & Matsumoto, 2008; Tracy & Robins, 2007; Widen et al., 2011); attachment-related emotions such as love, desire, and sympathy (Cordaro et al., 2018; Gonzaga et al., 2006); epistemological emotions such as interest, confusion, and awe (Campos et al., 2013; Shiota et al., 2003); and emotions related to the savoring of reward like contentment (Campos et al., 2013; Cordaro et al., 2018). Illustrative of this progress, data driven, open-ended empirical studies have uncovered a wider range of emotional signals, up to 28 in the face (Cowen & Keltner, 2019) and 24 in the voice (Cowen et al., 2018), many of which have been replicated in intensive coding of the patterns of facial bodily behavior of people from five cultures (Cordaro et al., 2018). In this investigation, we examine 34 multimodal dynamic expressions of emotion.

The study of emotional expression has shifted in a second way, to a more prominent focus upon other signaling modalities than facial muscle movement. For example, scientists have documented the signal value of gaze (Graham & LaBar, 2007; Lobmaier et al., 2008; Sander et al., 2007), head orientation (Nelson & Russell, 2011b), posture (Dael et al., 2012), tactile contact (Hertenstein et al., 2006), and dynamic body movement (Atkinson et al., 2004; Crane & Gross, 2007; Gross et al., 2010; Wallbott, 1998).

Lastly, the field has begun to move beyond static images and toward dynamic expressions (e.g., Bänziger et al., 2012; Krumhuber & Scherer, 2011; Mehu et al., 2012; Nelson & Russell, 2011a; O'Reilly et al., 2016; for review see Krumhuber et al., 2017). The shift to the study of dynamic expressions is justified for many reasons. Dynamic expressions of emotion allow the perceiver to see how emotions unfold over time. Select studies reveal that within the study of emotion recognition, dynamic expressions are better recognized than static expressions captured in still photographs (Bould et al., 2008), lead to higher ratings of intensity and arousal, and are perceived as more authentic (for review see Krumhuber et al., 2013). Taken together, these findings suggest that the field is moving toward the study of dynamic full-body, multimodal, expressions more closely resembling those encountered in daily social interactions (Scherer & Ellgring, 2007).

Intersectionality: How Culture, Gender, and Social Class Influence Emotion

Emotion signaling and recognition are shaped by cultural factors like country of origin and individualism and collectivism (Keltner et al., 2016; Matsumoto et al., 2008; Tsai et al., 2006). Emotion signaling varies according to culture-specific dialects (Elfenbein et al., 2007) and culture-related variation in the intensity of expressive behavior (Matsumoto, 1993). The recognition of emotion is shaped by culture-specific theories about emotion (Matsumoto et al., 2008). In the present investigation, we explore intersectionality in how gender, ethnicity, and social class influence the signaling and recognition of expressive behavior.

With respect to gender, women tend to outperform men in emotion recognition tasks in labeling static photos of the basic 6 (see meta-analyses by Hall, 1978; McClure, 2000; Thompson & Voyer, 2014). These gender effect sizes range from 18 to .52, with an average of .19 (Hall, 1978; Thompson & Voyer, 2014). This variablity is likely the result of the small samples of encoders and emotions studied.

With respect to culture, studies find universals in emotion recognition across geographical regions (see Elfenbein & Ambady, 2002; Laukka & Elfenbein, 2021). At the same time, there is cultural variability in how people express (Cordaro et al., 2018; Elfenbein et al., 2007; Laukka et al., 2014; Matsumoto et al., 2008) and recognize emotion (Fang et al., 2018; Gendron et al., 2014a, 2014b; Pell et al., 2009; Russell, 1994; Scherer et al., 2011). There is suggestive evidence that perceivers tend to be more accurate when decoding expressions from their own culture versus other cultures (i.e., an in-group advantage; Elfenbein et al., 2007; Laukka & Elfenbein, 2021). This was observed in studies comparing facial expressions of 10 emotional states including embarrassment and serenity between Gabon and Canada (Elfenbein et al., 2007); and the prosody of English speaking cultures including Australia and Kenya (Laukka et al., 2014). This effect varies in size across studies (Elfenbein & Ambady, 2002), and in some cases does not replicate (Matsumoto et al., 2009). In the present investigation, we examine the influence of ethnic background, with a concentration upon Asian, European, and Latinx individuals in the United States.

Social class—the wealth, education, and prestige of work a person enjoys— has received scant attention in the expression and recognition literatures. With respect to signaling, one study found that upper class individuals emitted fewer behaviors that engage with others, for example head nods or affirmative eye contact (Kraus & Keltner, 2009). In keeping with the broader argument that elevated power attenuates the capacity to empathize (Anderson et al., 2003; Galinsky et al., 2006; Keltner et al., 2003), a study found that lower class individuals were more accurate in judging emotions from expressive eyes movements portrayed in static photos (Kraus et al., 2010). In the present investigation, we extend these literatures on gender, ethnicity, and social class by studying the largest array of encoders and emotions to date.

Theoretically, our study is guided by concerns about intersectionality, the interconnections between gender, culture/ethnicity, and social class (Cole, 2009). These dimensions of identity are often construed in terms of availability and access to resources, or social power (Keltner et al., 2003; Kraus et al., 2012; Stryker & Burke, 2000). Given this power-based analysis, it is important to disentangle the relative contributions of these identity-related factors to capture their influences upon social behavior and social interactions.

The Present Investigation

The present investigation aimed to: examine the signal and recognition of full-bodied expressions of 34 emotional states; use a large set of stimuli that are more ecologically valid and nonprototypical than those often used in past studies of six emotions; include participants from diverse ethnic backgrounds, including Latinx Americans, who are less studied in the emotion literature; and examine how gender, ethnicity, and social class influence emotion signaling and recognition, and their relative contribution (i.e., intersectionality). Given the literatures reviewed above, we tested the following hypotheses:

> *Hypothesis 1:* People will reliably recognize a much wider array of emotion expressions than the basic six.
>
> *Hypothesis 2:* Women, compared to men, will show an advantage in recognizing emotion.
>
> *Hypothesis 3:* People will be better able to recognize emotion in the full-body expressions of people from their own ethnic group than other ethnic groups.
>
> *Hypothesis 4:* People from lower class backgrounds will be more reliable expressers of emotion (their full-bodied expressions will be better recognized), and more reliable judges of others' emotional expressions.

Method

Emotion Production Paradigm of Dynamic Full-Body Expressions

To create a more ecologically valid stimuli than static photos of posed facial expressions, we had people from diverse ethnic backgrounds express 34 emotions with their full bodies, and captured these displays on film. See Section 1 of online supplemental materials for details of this procedure. Based on recent data driven approaches to mapping distinctions in emotions (e.g., Cowen & Keltner, 2021) and theoretical analyses across the field, we gathered dynamic, full body expressions for 34 different emotions: Admiration, Adoration, Aesthetic appreciation, Amusement, Anger, Anxiety, Awe, Boredom, Confusion, Contempt, Contentment, Coy, Food Desire, Sexual Desire, Disgust, Ecstasy, Embarrassment, Enthusiasm, Envy, Fear, Gratitude, Guilt, Interest, Jealousy, Joy, Love, Pain, Pride, Relief, Sadness, Shame, Surprise, Sympathy, Triumph. See Table S1 for references of relevant studies for each emotion category.

Altogether, 156 untrained participants expressed these emotions in a 60-minute lab session (79% women, 21% men; M_{age} = 20.4, SD = 1.87). The ethnic backgrounds of expressers (i.e., encoders) were as follows: 53 identifying as Latinx American, 46 as White/European American, 16 as Asian American, 2 as Middle Eastern American, 4 as other, and 35 mixed identity. Participants first provided demographic information, including their placement on the MacArthur scale of subjective social status (Adler et al., 2000) with 1 representing the lowest standing in the United States and 9 the highest (M = 5.6, SD = 1.79). Next, each expresser was given a list of 34 emotion scenarios (see Table S2) one by one in random order. We derived the scenarios for each emotion category from conceptual analysis and recent emotion signaling and recognition studies (Cordaro et al., 2016, 2018, 2019; Sauter et al., 2010; Simon-Thomas et al., 2009; see Table S1). To produce the 34 dynamic expressions, researchers asked encoders to express each emotion how they naturally would, to use their bodies and no words, and to do so in whatever way felt natural. To standardize encoders' clothing, participants wore the same color dark gray t-shirt. This procedure was approved by the authors' institutional review board at the University of California, Berkeley.

Of the 5630 expressions that were collected, for the emotion recognition study we reduced this number to 2726 film clips, guided by the following criteria: participants followed the instructions and did not used intelligible words (i.e., speech such as "omg that's so cute!"); participants used their full body (body, face, and voice); and there were no external noises (door slams, and voices from outside). Trained research assistants reviewed all stimuli according to these criteria to select 2726 total video clips. Expressions averaged 8.04 seconds (range = 1–59 seconds), consistent with observed durations of dynamic stimuli gathered in other studies (for review see Krumhuber et al., 2017). For each emotion category the total number of encoders ranged from 42 to 126 (M = 80.18, SD = 21.33; see Table S3). To further standardize the stimuli, we normalized all the clips to similar volume.

Participants and Procedure

RecognitionTask

Emotion recognition data were obtained using the Amazon Mechanical Turk online platform during 2019. Guided by previous studies with similar design and observed effect sizes (Cowen & Keltner, 2017, 2019; Cowen et al., 2018, 2019), we recruited 555 English-speaking participants from the US (Age range 18–76, M_{age} = 37.95, SD = 12.5; 57% women, 41% men, 1% other, 1% did not respond), and obtained repeated judgments (average 54) from separate participants of each dynamic multimodal expression. The sample demographics were 409 White American, 51 African American, 41 Asian American, 35 Latinx American, 1 Native American, 12 Other, and 6 did not respond. The demographics section also included a measure of social class (Adler et al., 2000; M = 5.10, SD = 1.85, range = 1–10). Participants rated each dynamic multimodal expression in terms of 34 emotion categories by selecting the emotion that the person was expressing in a forced-choice paradigm (see Figure S1). We collected a total of 29,730 individual judgments. Participants were paid 55 cents for completing each emotion judgment survey. This procedure was approved by the authors' institutional review board.

Results

Recognition of Full Body, Multimodal, Dynamic Expressions of Emotion

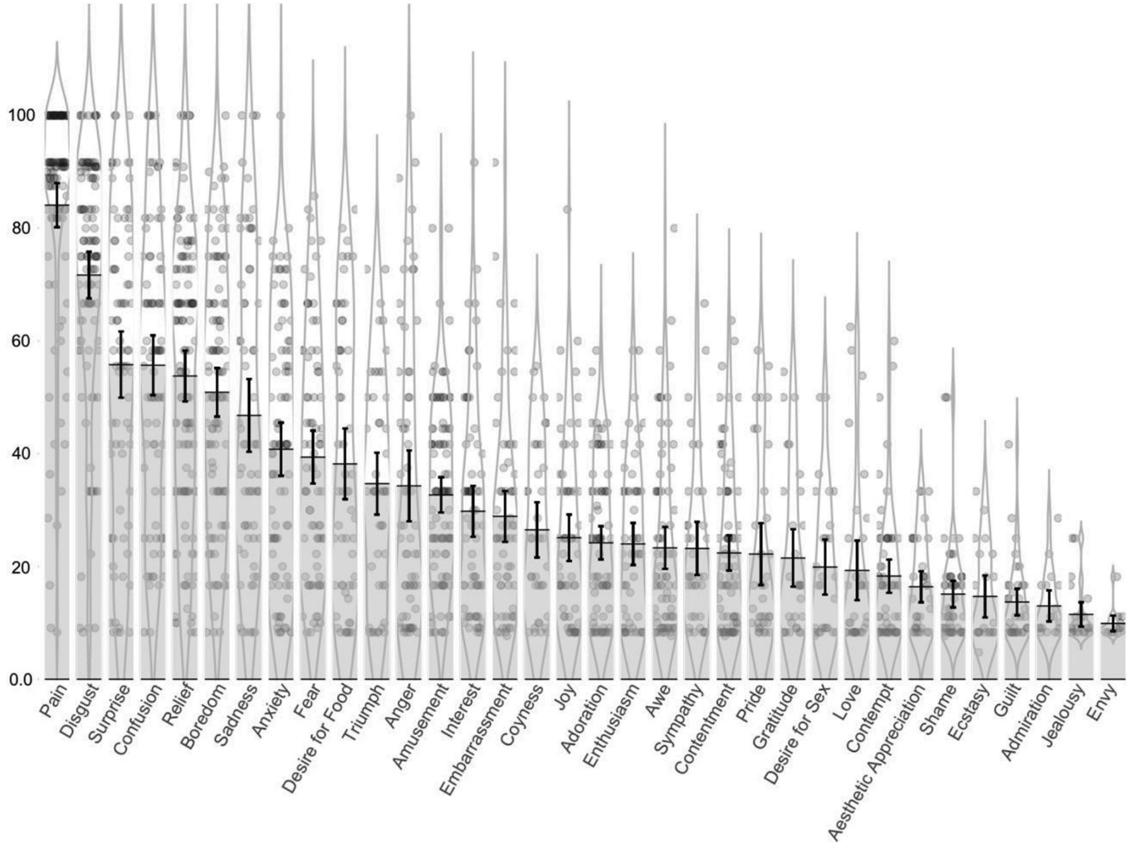
As a first step, to ensure data quality, we examined the validity of our stimuli. Of the total sample of 2726 full body dynamic stimuli, stimulus that were never recognized (i.e., those not recognized by at least one person) were excluded from all analyses.

We then examined whether people could recognize 34 emotions from the diverse array of encoders (N = 155) and the 2027 full-body dynamic expressions. To this end, we calculated the accuracy for each of the 2027 expressions from 22174 individual ratings, as well as the overall accuracy means for the 34 emotion categories. As illustrated in Figure 1, full-body expressions of 29 out of the 34 emotion categories were recognized at above chance rates. We adopted a minimal criterion for emotion recognition of 11.8%, or four times chance accuracy. We set chance to 11.8%, rather than 2.94% (i.e., 1 out of 34), as a more stringent test of emotion recognition. For these 29 emotional states, the 95% confidence intervals did not overlap with chance level accuracy, indicating statistically significant recognition. Expressions of Admiration, Ecstasy, Envy, Guilt, and Jealousy, though, were not recognized beyond chance levels.

Given the wide range of encoders, we observed high variability in recognition accuracy, and recognition accuracy varied across emotions. Among the 29 emotions recognized at above chance levels, recognition rates varied between 15.1 and 84.1%. Full-body expressions of disgust and pain were among the most readily recognized of the 34 emotions, 71.7 to 84.1%, respectively (for comparable results, see Cordaro et al., 2016, 2019). At the lower end, shame and aesthetic appreciation were recognized at 15.1 and 16.4%, respectively (Cowen et al., 2018). Across the 34 categories of emotion, the average weighted[1] accuracy rate was 38% (SE = 3.3%), which is not surprising given the complexity of the recognition paradigm—participants chose 1 emotion term out of 34—and is comparable to those documented in previous studies (e.g., 23.5% in Laukka et al., 2014; Sauter et al., 2010). Twenty three of the 34 emotions were labeled with the target emotion label most. See Section 3 and Table S5 in online supplemental materials for accuracy rates for each emotion and confusion matrices, which reveal the most common alternative labels for each emotion.

[1] We computed the overall weighted accuracy mean because the total stimuli per expression ranged from 13 to 118 (see Table S4).

Figure 1
Graph of Recognition Rates



Note. The bar plots show accuracy rates for each emotion, and the error bars indicate 95% confidence intervals. The sublayered violin plots show the density and distribution of data with jittered data points that have the same value (jittered horizontally to reduce overlapping).

Intersectionality in Emotion Signaling and Recognition

Gender

Guided by previous reviews (Hall, 1978; McClure, 2000; Thompson & Voyer, 2014), we examined gender differences in signaling and recognition of dynamic full-body expressions. In past studies, these gender differences were observed in judgments of the basic six from static photos, or from tests of sensitivity to nonemotional states (e.g., the PONS; Rosenthal et al., 1979) that had only a few encoders. In our test of 155 encoders and full-bodied expressions of 34 emotions, we found no significant differences in how well participants recognized (p = .16) women encoders (M = 38.5, SE = .8) and men encoders (M = 36.1, SE = 1.6). We next examined recognition rates of positive and negative emotions by gender of encoder. Positive emotions consisted of Admiration, Adoration, Aesthetic appreciation, Amusement, Awe, Contentment, Coy, Food Desire, Sexual Desire, Ecstasy, Enthusiasm, Gratitude, Interest, Joy, Love, Pride, Relief, and Triumph. Negative emotions consisted of Anger, Anxiety, Boredom, Confusion, Contempt, Disgust, Embarrassment, Envy, Fear, Guilt, Jealousy, Pain, Sadness, Shame, Surprise, and Sympathy. In these analyses, women and men were judged with comparable accuracy in their full-bodied expressions of 34 emotions ($ps > .08$).

Next, we examined overall differences in recognition by gender of the perceiver (i.e., decoder). We found that women (M = 37.2, SE = .7) and men (M = 35.1, SE = .9) decoders recognized others' expressions with similar accuracy (p = .06). In follow up analyses, no gender difference was observed in the accuracy with which participants recognized positive and negative expressions ($ps > .14$).

Ethnicity

We next examined whether recognition of emotions would be influenced by ethnic background of the encoder. Across all 34 emotion categories, our Asian American (M = 40.1, SE = 2.3), Latinx American (M = 37.8, SE = 1.2), and White/European American (M = 37.7, SE = 1.3) encoders did not differ in the accuracy with which they were recognized by outside observers in their full-bodied expression of 34 emotions (p = .63) (From this point forth, these groups will be addressed as Asian, Latinx, and White/Europeans)\. In analyses of the recognition of positive and negative emotion, we found no significant differences in recognition rates for our three ethnic groups ($ps > .42$).

We then examined differences in overall accuracy rates by decoders, and found that Asians (M = 37.5, SE = 2.1), Black/African Americans (M = 35.7, SE = 1.9), Latinxs (M = 30.9, SE = 2.3), and White/

Europeans (M = 36.8, SE = .7) recognized expressions of the 34 emotions at similar levels of accuracy (p = .08). Ethnicity did not influence the accuracy with which decoders recognized positive emotions (p = .36) or negative emotions (p = .03). Given the multiple tests of ethnicity, we used a Bonferroni-adjusted alpha level of $p < .02$. In all, these analyses suggest that are no differences in emotion recognition by the ethnic identity of the encoder or the decoder.

Next, we examined whether there was a within ethnic group advantage in the recognition of 34 emotions. To test this in-group advantage effect, we examined within and between ethnicity differences in our study. We found that Asian decoders recognized the expressions of other Asians, Latinxs, and White/Europeans at similar accuracy rates (p = .40). Latinx decoders recognized other Latinxs, Asians, and White/Europeans at comparable overall accuracy rates (p = .21). White/European decoders recognized other White/Europeans, Asians, and Latinxs with similar accuracy rates (p = .63; see Table 1). Likewise, Black decoders recognized Asians, Latinxs, and White/Europeans with similar accuracy rates (p = .98).[2] We also did not find significant differences between or within groups in ratings of positive or negative emotions (ps $>$ .11).

Social Class

We last examined if social class influenced emotion signaling and recognition. To do so, we first calculated overall recognition accuracy rates for each encoder and decoder. Then we tested a model with overall accuracy rates as the outcome. In this analysis, we found that across all 34 expressions of emotions, the social class of the encoder predicted overall reliability in emotion recognition, such that lower class individuals were more reliably judged in their full-body expression of 34 emotions ($\beta = -.21$, p = .007). We also found evidence for the influence of social class upon our decoders' ability to recognize emotion ($\beta = -.22$, $p < .001$). In this analysis, lower class individuals proved to be better judges of others' full-body expressions of 34 emotion states. See Table 2 for model summaries. Lastly, we examined interactions by culture or gender and found no significant results (ps $>$ .61), and the effect of social class held when controlling for culture or gender (see Section 2 of online supplemental materials).

Discussion

In the present investigation, 155 individuals from diverse ethnic backgrounds were given rich situations typical of 34 emotion states and asked to use their full bodies to express the state. A second group of participants was asked in a challenging forced choice paradigm to pick the single state out of 34 that best characterized the emotion expressed in these displays.

Table 1
Within and Between Ethnicity Differences

	Decoders			
Encoders	Asian	Latinx	White/Euro	Black
Asian	36.3 (4.5)	32.3 (4.8)	35.5 (1.4)	35.8 (4.1)
Latinx	41.1 (3.7)	24.1 (4.4)	36.3 (1.2)	34.8 (3.8)
White/Euro	33.5 (4.1)	33.4 (3.9)	37.3 (1.2)	35 (2.9)

Note. These values represent average recognition rates in percentages across all 34 emotions, and the scores within the parenthesis represent the standard errors.

Our first interest was to build upon recent discoveries concerning the high dimensional space of emotional expression (e.g., Cowen et al., 2019; Cowen & Keltner, 2021). Our results indicate that people can recognize 29 full-body expressions above chance levels. Those included Adoration, Amusement, Anger, Aesthetic appreciation, Awe, Anxiety, Boredom, Confusion, Contempt, Contentment, Coy, Food Desire, Sexual Desire, Disgust, Embarrassment, Enthusiasm, Fear, Gratitude, Joy, Interest, Love, Pain, Pride, Relief, Sadness, Shame, Surprise, Sympathy, and Triumph. These results converge with recent findings on the recognition of emotion from the voice (Cordaro et al., 2016; Cowen et al., 2018; Laukka et al., 2014), the face (Cordaro et al., 2019; Cowen & Keltner, 2019), and dynamic multimodal expressions (Bänziger et al., 2012; Sauter & Fischer, 2018). There is much more to the expression of emotion than facial muscle configurations of six emotion (for review, see Keltner et al., 2019).

Importantly, there was considerable variation in the recognition of this rich landscape of emotion states (e.g., Dael et al., 2012). Some emotions (e.g., disgust) were better recognized than others (e.g., shame). Some emotions were more confused than others (see Section 3 and Table S5 of online supplemental materials). Some individuals were better recognized than others. The recognition of emotion varies considerably according to emotion, individual, and perceiver (Haidt & Keltner, 1999; Keltner et al., 2016).

Our second interest was that of intersectionality: how gender, ethnicity, and social class influence emotion signaling and recognition. Departing from past studies, we did not observe gender differences in the signaling or recognition of full body expressions of emotion. Several reasons might account for this. Our stimili and encoders were richer and more complex than those used in past studies (e.g., static photos of facial expression of the basic 6). Multimodal, full-body expressions may provide a richer source of information than that of the face alone, giving the decoder a wide range of cues to infer emotion. Our study took place roughly a generation after early meta-analysis (e.g., from the 1980s), and almost a decade after the latest report. Given societal changes and transformative shifts in thinking about gender identity, perhaps gender differences in emotion signaling and recognition are less pronounced today.

The ethnic background of the encoder or decoder also had no influence on emotion signaling and recognition. Importantly, our encoders and decoders were diverse, and included Asian, European, Latinx, and African Americans (in the case of decoders). Our failure to find ethnicity-related variation in the signaling and recognition of 34 states is in keeping with the literature, which finds small and inconsistent effects of culture (Cordaro et al., 2019; Elfenbein & Ambady, 2002; Matsumoto et al., 2009).

Social class, however, did systematically influence emotion signaling and recognition in theoretically cogent ways. Independent of gender and ethnic background, lower class individuals proved to be more adroit in signaling emotion in full-bodied expression and better judges of others' expressions of 34 states. These findings are in keeping with recent evidence finding that lower class

[2] Given the demographic composition of our encoders, we were only able to examine between ethnic differences in our Black/African Americans decoders.

Table 2
Overall Recognition Accuracy Predicted by Social Class

	Encoders				Decoders			
Predictors	β	CI	*t*	*p*	β	CI	*t*	*p*
Intercept	0.00	[−0.16, 0.16]	0.00	<.001	−0.00	[−0.08, 0.08]	−0.00	<.001
Social class	−0.21	[−0.37, −0.06]	−2.72	.007	−0.22	[0.31, −0.14]	−5.25	<.001
Observations	155				528			
R^2/R^2 adjusted		0.046/0.040				0.050/0.048		

Note. CI shows 95% confidence intervals. All estimates are standardized. Five percent of the decoders did not provide information on social class.

individuals are more attentive to others in the social environment and better judges of emotion from eye movements portrayed in static photos (Dietze & Knowles, 2021; Kraus et al., 2010, 2012). The present study builds considerably upon this research.

The results related to social class raise important questions. What are the proximal causes of these class-related differences in emotion signaling and recognition? A greater attention to others? The feeling of reduced power and the inclination to take others' perspectives (Galinsky et al., 2006)? Given these findings, studies of gender, ethnicity, and culture would be well served to systematically account for variation in social class. Our results suggest that observed gender differences, or ethnic differences in emotion signaling and recognition, for example, might be the result of social class differences.

Several limitations of the present investigation warrant consideration. Our recognition rates were comparable to those of past studies (Laukka et al., 2014; Sauter et al., 2010), but they were relatively low. It is important to recall: the complex judgment task (choosing one term out of 34); the nonprototypical and highly variable stimuli; and the study of states, such as envy, guilt, or jealousy, that may not have reliable signals. The ethnic composition of our samples was unbalanced, in particular for our decoders. Lastly, although our stimuli were created with untrained encoders who were allowed to express as they naturally would, it still classifies as posed expressions of emotion. Future studies can examine the recognition of naturally occurring stimuli (e.g., Cowen et al., 2021). Additionally, future studies can build on this work and examine the relative contributions of different modalities—face vs body vs voice— in emotion recognition.

Our study provides important contributions to the field of emotion. It adds to others like it revealing that emotional expression is a rich and subtle grammar of social interaction. It also reveals that emotion signaling and recognition are shaped in significant ways by social identity, in this case social class.

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