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Accuracy of spontaneous dynamic teacher emotion recognition by Japanese college students

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This study measures how accurately Japanese university students judge the emotion expressions of both Japanese and non-Japanese teachers and how much of that judgement is based on facial expression and physical movement. Silent recordings of ten teachers spontaneously displaying emotions during authentic classroom teaching sessions were digitally processed into either motion capture (point-light display) or had their backgrounds blurred (full-light display). Both types of videos were then viewed by 118 university students aged 18–22. Participants selected the emotion that they perceived the teacher to be expressing in each video (*happiness, pride, interest, surprise, irritation, stress, sadness, fear* and *other*). Emotion recognition accuracy was higher in full-light than point-light displays for both teacher groups, except for *sadness*, which was significantly more accurately perceived in the point-light display. For negative emotions, perception accuracy was higher in the full-light condition compared to the point-light condition for both Japanese (27.1% vs. 18.5%) and non-Japanese teachers (22.2% vs. 13.0%). A similar trend was observed for positive emotions, where Japanese teachers in the full-light condition exhibited a higher perception accuracy (42.2%). Statistical analyses showed significant differences between conditions, with perception accuracy consistently higher in the full-light than the point-light condition in both emotion types and cultural backgrounds ($p < 0.05$). These findings add further evidence to the existence of the in-group advantage in recognition accuracy in spontaneous dynamic (non-static) stimulus materials. In the EFL classroom, and other similar multicultural contexts, stakeholders should be guided to make best use of any existing advantages, to allow the most mutually beneficial relationships to form and thrive. Future research should explore how these findings can be integrated into teacher training programs to foster more effective communication in classrooms, both cross- and intra-cultural.

KEYWORDS

teacher emotions, emotional perception, emotion recognition, emotion regulation, spontaneous expressions, in-group advantage

1 Introduction

The ability to quickly and consistently recognize the emotions of others is central to most social encounters (Van Kleef et al., 2011). The cultural relativist theory suggests that such recognition is highly dependent on culture (Birdwhistell, 1970) with *ethnic bias* (Kilbride and Yarczower, 1983), or *in-group advantage* (Elfenbein and Ambady, 2002b) affecting how accurately emotion expression is perceived. In the classroom, teacher emotion expressions have far-reaching effects with “compelling theoretical reasoning that teacher emotions and student outcomes are systematically linked” (Frenzel et al., 2021, 253). Positive teacher emotions are found to be of particular importance (Banerjee et al., 2017; Frenzel et al., 2020; Frenzel et al., 2021, Hosotani and Imai-Matsumura, 2011; Uitto et al., 2015). As such, many teachers work to regulate their emotions, amplifying the positive and downregulating the negative (Sutton et al., 2009; Winograd, 2003; Zembylas, 2005).

How learners perceive teachers’ emotion expressions has been found to impact the ways in which learners view the teacher and class (Moskowitz and Dewaele, 2021), the emotions learners report feeling during class (Becker et al., 2014), and teacher efficacy (Cheng et al., 2022). Much of the work on students’ perception of teacher emotion expressions, however, overlooks how teachers themselves feel (Frenzel et al., 2009), or relies on either diaries or questionnaires (e.g., Buriæ et al., 2018; Frenzel et al., 2016; Gramipour et al., 2019; Hong et al., 2016), which tend to capture emotional traits rather than temporary states (Becker et al., 2014).

Similarly, little is known about how accurately students perceive teacher emotion expressions (Becker et al., 2014; Frenzel et al., 2009) especially when teachers are of different cultural backgrounds from their students.

Although some studies have explored student perception of teacher emotions, these have relied on surveys (Frenzel et al., 2009) or experience sampling (Becker et al., 2014) to capture impressions of the whole classroom and all its composite parts. The study presented here, conducted in a Japanese university English as a Foreign Language (EFL) classroom, centers on student perception of teacher non-verbal communication. While it builds on research using dynamic (non-static) stimulus materials, it is unique in employing classroom video footage recorded during regular lessons, with teachers interacting naturally with familiar students. In contrast with previous studies using laboratory settings (see, for example, Di Crosta et al., 2020), the footage used here reflects real teacher–student interactions and spontaneous communication.

It was hypothesized that:

1. Japanese student participants would more accurately perceive the emotion expressions of Japanese teachers than non-Japanese teachers,
2. Perception would be more accurate in full-light, minimally-digitally altered stimulus materials than in point-light, digitally processed motion capture stimulus materials, and
3. Perception of positive emotion expressions would be more accurate than perception of negative emotion expressions.

2 Literature review

Although emotions are universal, the ways in which they are felt, expressed, perceived, and managed vary significantly across different cultures and contexts. Culture and social surroundings play a crucial role in shaping emotional experiences, influencing how individuals display, interpret, and respond to emotions (Richerson and Boyd, 2005). Our ability to recognize the emotion expressions of others varies, with *ethnic bias*, defined by Markham and Wang (1996, 620) as “the better recognition of facial expressions displayed by one’s own ethnic group,” explaining some of that variation (Kilbride and Yarczower, 1983; Matsumoto, 1992). Later renamed *in-group advantage* by Elfenbein and Ambady (2002a), “[p]ut simply, people may be able to perceive more accurately those emotions expressed in a more familiar style” (244). In a meta-analysis of 97 studies, they found emotions to be universally perceived at an above-chance accuracy level, and that when encoder and decoder are from the same cultural group recognition accuracy increases. Research since has continued to explore the phenomenon (Elfenbein et al., 2007; Elfenbein et al., 2004; Nelson and Russell, 2013), with analysis of muscle usage based on the Facial Action Coding System (Ekman et al., 2002) finding consistent differences in the standardized expressions described there amongst members of the same cultural (or subcultural) group (Elfenbein et al., 2007). These *cultural dialects*, or non-verbal emotion expressions differing slightly by culture, further explain in-group advantage (Elfenbein, 2013; Elfenbein and Ambady, 2002b).

Tomkins (1962) 1963 first described a universally used and understood group of initially eight primary affects, each ranging from mild to extreme. Ekman (1972, 1980, 1982) further delineated Tomkins’ work, refining a model of six (or sometimes seven, Ekman and Friesen, 1969a) iconic expressions that were each the result of a basic emotion. In the Neurocultural Theory, spontaneous expressions resulting from biological processes, produced and understood consistently and in private were considered universal, and different from those expressions displayed in public because of social norms (Ekman, 1972; Ekman and Friesen, 1969a,b). Writing in 1987, Ekman et al. (1987) reported that, “the evidence now for universality is overwhelming, whereas that for cultural differences is sparse” (717). Other studies have since explored the perception accuracy of a range of emotions, those of note to this study shown here in Table 1.

The impact of whether the emotion expressions used in stimuli is posed or naturally and spontaneously occurring has also been widely explored. Because spontaneous emotion expressions are both complex and subtle (Matsumoto and Hwang, 2010), many studies instead ask study participants to judge actor or dancer portrayals of emotional states (Atkinson et al., 2004; Clarke et al., 2005; de Gelder and Van den Stock, 2011; Sogon and Masutani, 1989). Some have suggested that such stimuli may lack ecological validity, with Nelson and Russell (2013) describing higher levels of recognition accuracy, perhaps because the most easily recognized portrayals are selected for inclusion (Scherer and Bänziger, 2010). Recent work comparing human and machine recognition performance across broad corpora

of posed and spontaneous dynamic facial expressions also shows generally higher accuracy on posed prototypical stimuli (Krumhuber et al., 2021).

Inconsistent findings of in-group advantage may also be connected to whether stimuli are posed/enacted or spontaneous. Some work, notably that of Matsumoto et al. (2009a), and of Matsumoto et al. (2009b), finds no evidence of in-group advantage in emotion perception of spontaneous stimuli. Their use of Olympic Games photographs as stimuli may explain their findings, however. Scherer and Bänziger (2010), for example, point to how people in public, especially in the presence of cameras, suppress, modify, or replace authentic expression to follow sociocultural display rules. Another possible explanation may rest in the identity of the encoders: Olympic athletes have few true peers to act as decoders. Finally, different Action Units (contractions or relaxations of one or more muscles, Ekman et al., 2002), have been found to be activated in posed and spontaneous expressions of the same emotion (Namba et al., 2016), with more used when emotions are posed (Fang et al., 2022). As such, while Kang and Lau (2013) and Fang and Ge (2024) both found evidence for the in-group advantage in both posed and spontaneous dynamic stimuli, Fang and Ge (2024) found that recognition accuracy was higher for posed stimuli, perhaps indicating the significance of awareness of the shared signals of group identity. Again, however, this accuracy may simply rest in the encoder's intention that their emotion be correctly perceived by others. The use of spontaneous stimuli in the study described in this article addresses this limitation and provides a more realistic test of emotion perception.

While early work in emotion perception used static facial images as stimuli, more recent work has also explored dynamic stimuli, as used in this study, which has been shown to improve emotion recognition accuracy by providing additional non-verbal cues (Khosdelazad et al., 2020). Building on the early suppositions of Darwin (1872) that the body also reliably conveyed emotion, recent work also examines bodily movement (Aviezer et al., 2012; Bänziger and Scherer, 2010; Bente et al., 2016; Dael et al., 2013; de Gelder and Van den Stock, 2011;

de Meijer, 1989; Zieber et al., 2014), recognizing that “bodily expressions have a solid neural basis” (de Gelder et al., 2015, 155). “[P]erception serves an adaptive function and [that] the external world must therefore provide information to guide biologically and socially functional behaviors” (McArthur and Baron, 1983, 215), with bodily movement able to be seen and therefore decoded from much further away than facial expression (Martinez et al., 2016). Further research has found that emotions can be decoded at above-chance levels in point-light display, when only physical movement is available to convey the encoder's emotion (Atkinson et al., 2004; Clarke et al., 2005; Dittrich et al., 1996) or when the encoder is filmed from behind (Sogon and Masutani, 1989).

Finally, it is important to mention the impact that emotional regulation, “attempts individuals make to influence which emotions they have, when they have them, and how these emotions are experienced and expressed” (Gross et al., 2006, 14), has on the encoding and decoding of emotion. In collectivist cultures such as Japan, cultural norms encourage people to regulate emotion expressions so as not to disturb social harmony (Oyserman et al., 2002), with Japanese people describing less intense anger in daily life than Americans (Kitayama et al., 2006). Matsumoto and Ekman (1989) suggest that “the Japanese display and decoding rules may have to do with undue expression and perception of any emotion, not just negative emotion” (155). Lebra (1983), too, describes a “modesty code whereby the self is supposed to remain hidden, unexpressed, or inconspicuous (197). In the classroom, many teachers work to amplify positive emotions and deregulate negative ones in the belief that it improves discipline and teacher-student relationships (Sutton et al., 2009). Qualitative research shows examples of teachers who feel that they must refrain from expressing negative emotions in the classroom (Liljestrom et al., 2007), and the need for “masking and maintaining emotional distance” (Hargreaves, 2001, 1069). In Japan, where the role of teacher is traditionally widely respected in society, these pressures are strong (Lassila and Uitto, 2016; Hosotani and Imai-Matsumura, 2011).

While many studies have explored emotion recognition, the majority have relied on posed or static emotion expressions (e.g., Ekman, 1972; Matsumoto, 1992). Although studies like Nelson and Russell (2013) and Krumhuber et al. (2021) have acknowledged these limitations, there remains a lack of research focussed on dynamic, spontaneous emotional displays. Research on ingroup advantage (Elfenbein and Ambady, 2002a) has highlighted the role of cultural familiarity in emotion recognition, but much of this work again uses controlled stimuli. Moreover, while dynamic stimuli have been studied (e.g., Atkinson et al., 2004; Aviezer et al., 2012), their controlled laboratory settings limit how findings can translate to the real world. Similarly, motion-capture techniques have shown promise in isolating movement-based cues (e.g., Dael et al., 2013), but they are rarely applied to real contexts. These gaps in the literature underscore the need for further research on spontaneous emotion expressions in dynamic environments, with particular attention to cross-cultural and contextual factors.

TABLE 1 Elements of instruments used in existing emotion perception studies.

Research study	Element
Tomkins, 1962, 1963	enjoyment- joy, distress-anguish, anger-rage, fear-terror, disgust, interest-excitement, surprise-startle, contempt, shame-humiliation
Ekman, 1972, 1980, 1982	happiness, sadness, anger, disgust, fear, interest, surprise
Clarke et al., 2005	joy, sadness, anger, disgust, fear, romantic love
Montepare et al., 1987	happiness, sadness, anger, pride
Sogon and Masutani, 1989	joy, sadness, fear, disgust, anger, surprise, contempt
Atkinson et al., 2004	happiness, sadness, anger, disgust, fear
Jack et al., 2009	happy, sadness, anger, fear, disgust, surprise plus neutral
Glowinski et al., 2011	pleasure, amusement, elation, sadness, despair, irritation, rage, fear, pride, interest, relief, worry

3 Materials and methods

3.1 Setting and participants

Two groups of participants were recruited: university teachers to be filmed teaching in their regular classrooms and students to watch and evaluate the emotions expressed in the resulting videos. The two groups of participants were not known to one another. A convenience sample of five Japanese and five non-Japanese female university teachers were recruited using social media channels. Japanese university EFL learners are most familiar with language teachers from Japan and Inner Circle countries such as the United States, the United Kingdom, Canada, New Zealand, Australia and Ireland where English is the primary language, used in daily life and government institutions (Kachru, 1998; Chiba et al., 1995; Toh, 2013). Beginning in the third year of elementary school (Kurokawa, 2020; Ministry of Education, Culture, Sports, Science and Technology [MEXT], 2018; Lightbown and Spada, 2019), most EFL classes are taught by a combination of local teachers and foreign nationals. Teachers from these countries, and whose teaching schedule and institutional research ethics policies allowed for classroom filming were selected from those who volunteered. There is no clear precedent in the literature as to whether male or female encoders are preferable for emotion recognition studies. The use of a single gender in any study reduces variables in the data, however, while at the same time limiting the generalizability of the study. More female than male teachers were able to participate, and for this simple reason the sample became female. It is difficult to assess how representative this sample is because no official information has been collated about the gender or age of EFL teachers in Japan, either Japanese or non-Japanese, or about the specific nationalities of non-Japanese teachers. Between 32 and 56 years of age, all the teachers have a master's degree and either a Japanese teaching license, a Teaching English to Speakers of Other Languages (TESOL) qualification, or both, and have more than 5 years' TESOL teaching experience. While within each teacher group (Japanese and non-Japanese) there is diversity of experience and background, such differences have been limited as far as possible within the confines of the study. All teachers gave written consent before filming, when choosing clips for selection, and when submitting their labelled clips.

A total of 118 Japanese student participants educated in Japan, 69 male, 49 female, and 0 non-binary, aged between 18 and 22, were then recruited from amongst the undergraduate cohorts at the researcher-affiliated institutions, both four-year STEM (science, technology, engineering, and mathematics) programs. None of the teacher participants were known to the student participants. The students understood that they were free to withdraw at any time and undertook the survey outside of class time. All participants, both teachers and students, read statements in Japanese and/or English explaining the content and scope of the study and gave consent, in line with institutional research ethics board policies.

3.2 Instruments

3.2.1 Stimuli

The stimuli consisted of 32 short silent video clips averaging 7.31 s selected from the teaching videos collected. Audio cues were

first excluded to remove language comprehension as a potential variable. The researchers identified short sections in which the teacher seemed to experience a single emotion. The teacher participants then labeled their own clips with the emotions that they felt during their filming, using either Japanese or English. In line with suggestions on how to maximize ecological validity from Nelson and Russell (2013) they were not given a list to choose from. Instead, they were asked to try to remember the emotions of the moment. This step was also undertaken in this way to ensure that the teachers' emotional state during the video clip was measured rather than their general emotional traits. Interestingly, although some teachers wrote full sentences, or several adjectives rather than just one, all were able to be subsumed within the eight survey options chosen. For example, "overjoyed" was included as *happy*, "blue" as *sad*, and "I thought that that was wonderful!" [素晴らしいと思いました。] as *proud (of students)*. Some teachers asked that specific clips not be used, or were unable to identify emotions within them, and those clips were not used.

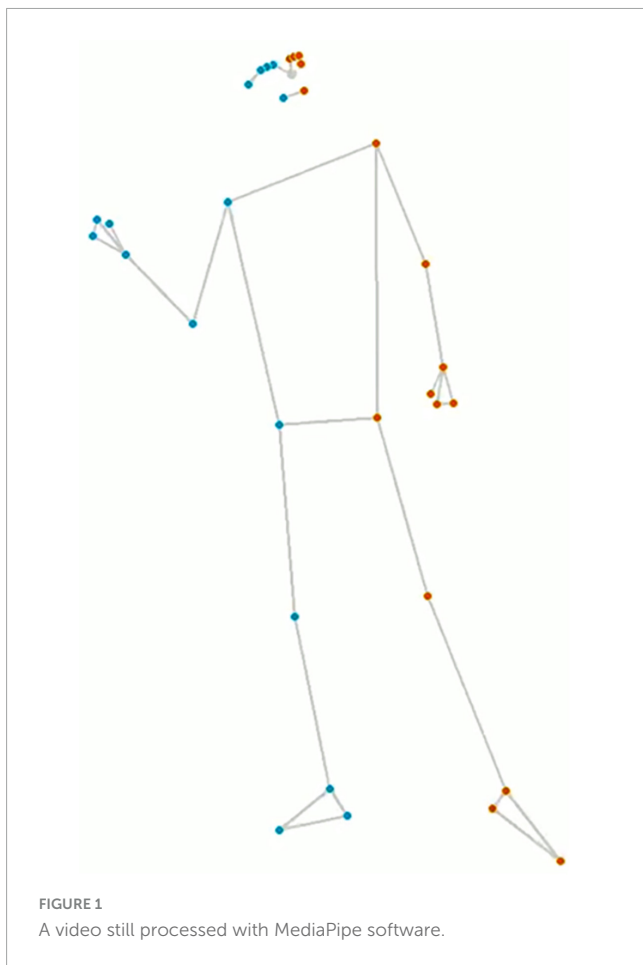
One of the emotions that several teachers labeled their video clips with was *proud*, defined by Tracy et al. (2013) as "the emotion experienced in response to success, achievement, or superiority over others" (164). When the researchers asked the teacher participants for clarification, it became apparent that teachers were describing the pride that they felt in their students' abilities, achievements or progress rather than any personal hubris. They did not "tie[d] (pride) to extrinsic values of public recognition and social dominance" (Carver and Johnson, 2010, 698). As such, in consultation with the teacher participants, relevant emotion expressions were relabeled *proud (of students)*. Partially in line with previous findings about the physical manifestation of *pride*, in these clips all teachers had "a small smile, with head tilted slightly back, [and] visibly expanded posture" (Tracy and Robins, 2004, 194). While none showed "arms raised above the head or hands on hips" (194), all had forward-facing palms reflecting their expanded posture.

Background-blurring software was used to limit the potential influence of, for example, written information on the whiteboard or posters on the classroom walls, or MediaPipe software (Lugaresi et al., 2019) was used to simplify the teacher physical form to that of a stick figure (see Figure 1), also known as point-light display or motion capture.

3.2.2 Survey instrument

Elements of instruments used in existing emotion perception studies (see Table 1) were combined with the emotions that the teacher participants had used in labelling their own teaching video clips. Along with *happy*, *proud (of students)*, *interested*, *surprised*, *sad*, *stressed*, *irritated* and *afraid*, *other* was also included as an answer option. While previous research shows that Japanese survey participants are much more likely to choose either *other* or the central choice on Likert-type scales (Horler and Yamazaki, 1986; Lee et al., 2002; Zax and Takahashi, 1967) the researchers were concerned that participants would struggle to complete the large survey (64 video clips) without this option.

Although common in emotion perception studies (see Table 1), *disgust* was rejected as a survey option because, just as in previous educational context studies, no teachers reported this emotion during their taped teaching sessions. Although this exclusion may limit the depth of the findings in terms of emotional diversity,



because of its lack of relevance to this context, it was not included. The emotional intensity of another common survey inclusion, *anger*, was also felt to be unsuitable for this context, with no teachers reporting anger during their recorded session. Several teachers did, however, label clips with *irritated*, which was included instead. When considering the importance of a balanced valence in the survey, with previous studies heavily weighted toward the exploration of negative emotion expressions (see Table 1), *afraid* (fear) was included here as a basic emotion validated by previous research (Ekman, 1972), although no teachers reported it. The adjective *afraid* was chosen rather than the noun *fear*, in line with the way that most of the teachers had labelled their teaching clips.

The survey was written in both English and Japanese, with translations checked for accuracy using the back translation method (Brislin and Freimanis, 2001) by the native Japanese speaker authors of this study and, separately, a translation specialist. The question-and-answer options are listed below, in English and Japanese.

How do you think the teacher is feeling?

教員はどのような気分・感情にいますか。

1. happy 喜んでいる
2. proud (of students) 学生のことを誇りに思っている
3. interested 関心を寄せている
4. surprised 驚いている
5. sad 悲しい

6. stressed 余裕がなさそう
7. irritated イライラしている
8. afraid 怖がっている
9. other その他

3.3 Procedure

The 64 clips (32 full-light with blurred background, 32 point-light showing the teacher as a moving stick figure) were uploaded to an online form in random order, with the same question and answer options under each. Student participants were asked to open the link to the online form on either their own smart device or one of the classroom tablet computers. They were reminded of their right to withdraw from the experiment at any stage and instructed to watch each video as many times as necessary to identify the emotion expressed within. They then filled in the descriptive data survey, watched the videos, and identified the emotion that they perceived in each. Participants needed between 15 and 20 min to complete the survey.

3.4 Data processing and analysis

Data were downloaded from the survey website and processed using Microsoft Excel. These data were then uploaded to JASP (JASP Team, 2023) for analysis. A one-sample *t*-test was run to determine whether the accuracy rates for each emotion in each condition were significantly above chance (here 11.1%)¹, and a two-sample *t*-test was run to determine whether there was a significant difference in perception accuracy between the emotion expressions of Japanese and non-Japanese teachers. A two-way ANOVA (Analysis of Variance) was then run to analyse interactions between teacher cultural background and display condition across all emotions, as it allows for testing the combined effects of these factors on perception accuracy.

Finally, a Tukey's range test *post hoc* pinpointed where the differences lay.

4 Results

Table 2 presents the results of the statistical analyses conducted to assess emotion recognition accuracy across conditions (point-light and full-light) and teacher cultural backgrounds (Japanese and Non-Japanese). For each emotion, the table reports mean

¹ It should perhaps be noted that while many emotion perception studies compare perception to "chance," no study to date has considered how expectation may skew chance in an educational setting. Although students may have a higher chance of assigning specific emotions to teacher emotion expression videos because of how they expect teachers to feel, in line with existing studies, we have assigned chance without considering such expectation. This decision was undertaken due to the complexity of assigning chance in the Japanese cultural context, in which displays of emotion are largely considered inappropriate for the workplace. The university students, not yet members of the workforce, may also have an incomplete understanding of these ambiguous social mores.

TABLE 2 Statistical analysis of emotion recognition accuracy across conditions and cultural backgrounds.

Emotion	Condition	Teacher cultural background	Mean (%)	One-sample t	p-value	Cohen's d	Two-sample t	Two-sample p	Two-sample d
Happy	Point-light	Japanese	8.5	-1.45	0.15	-0.09	-2.52	0.013	-0.20
		Non-Japanese	18.6	2.10	0.038	0.19			
	Full-light	Japanese	45.8	10.67	< 0.0001	0.69	-3.40	0.0008	-0.20
		Non-Japanese	64.4	12.04	< 0.0001	1.11			
Sad	Point-light	Japanese	21.2	2.67	0.0087	0.25	4.92	< 0.0001	0.50
		Non-Japanese	1.7	-7.88	< 0.0001	-0.73			
	Full-light	Japanese	2.5	-5.88	< 0.0001	-0.54	1.01	0.32	0.10
		Non-Japanese	0.8	-12.10	< 0.0001	-1.11			
Irritated	Point-light	Japanese	16.7	2.81	0.0053	0.15	0.05	0.96	0.0038
		Non-Japanese	16.5	2.24	0.026	0.15			
	Full-light	Japanese	29.1	7.44	< 0.0001	0.40	-2.37	0.018	-0.20
		Non-Japanese	38.6	8.65	< 0.0001	0.56			
Proud (of students)	Point-light	Japanese					No data		
		Non-Japanese	11.0	-0.07	0.94	-0.003			
	Full-light	Japanese					No data		
		Non-Japanese	26.0	9.03	< 0.0001	0.34			
Stressed	Point-light	Japanese	19.9	3.38	0.0008	0.22	1.94	0.053	0.15
		Non-Japanese	14.0	1.80	0.072	0.08			
	Full-light	Japanese	36.4	8.07	< 0.0001	0.53	4.73	< 0.0001	0.40
		Non-Japanese	19.3	4.50	< 0.0001	0.32			
Interested	Point-light	Japanese	22.0	4.04	< 0.0001	0.26	0.91	0.36	0.10
		Non-Japanese	19.1	4.40	< 0.0001	0.20			
	Full-light	Japanese	35.2	7.73	< 0.0001	0.50	-3.94	< 0.0001	-0.30
		Non-Japanese	50.4	17.07	< 0.0001	0.79			
Surprised	Point-light	Japanese	9.7	-0.70	0.48	-0.05	1.74	0.083	0.15
		Non-Japanese	5.5	-3.76	0.0002	-0.24			
	Full-light	Japanese	45.8	10.67	< 0.0001	0.69	-2.31	0.021	-0.20
		Non-Japanese	56.4	13.99	< 0.0001	0.91			

*Significant values have been highlighted in bold.

perception accuracy percentages, one-sample *t*-test results comparing performance to the baseline of 11.1%, two-sample *t*-test results comparing perception accuracy of Japanese and non-Japanese teacher emotion expressions, and corresponding effect sizes (Cohen's *d*). Significant results ($p < 0.05$), and meaningful effect sizes ($d > 0.2$) are highlighted to emphasize key findings.

In the point-light condition, one-sample *t*-tests demonstrated that students' perception accuracy of *irritated* and *interested* were significantly above the baseline of 11.1% for both Japanese and non-Japanese teacher emotion expressions ($p < 0.05$). However, *happy* and *sad* showed contrasting results, with significantly higher perception accuracy for non-Japanese teacher *happiness* ($M = 18.6\%$, $p < 0.05$) and lower for *sadness* ($M = 1.7\%$, $p < 0.001$). Two sample *t*-tests indicated significant differences between teacher cultural backgrounds: *happy* ($t = 2.52$, $p = 0.013$) and *sad* ($t = 4.92$, $p < 0.001$). In the full-light condition, perception accuracy for most emotion expressions increased markedly, particularly for *happy* and *surprised*, with mean accuracies of 64.4% and 56.4%, respectively, for non-Japanese teacher emotion expressions. Significant differences in perception accuracy between Japanese and non-Japanese teacher emotion expressions were also observed for *happy* ($t = -3.40$, $p < 0.001$) and *interested* ($t = -3.94$, $p < 0.001$), with generally higher perception accuracy for non-Japanese teacher emotion expressions in the full-light condition.

ANOVA results revealed a significant effect of teacher cultural background and lighting condition on emotion recognition accuracy, with $F(3,7548) = 151.39$ and $p < 0.0001$. *Post hoc* Tukey HSD comparisons showed that both Japanese and non-Japanese teacher emotions were recognized with significantly higher accuracy in the full-light condition compared to the point-light condition ($p < 0.0001$ for all comparisons). While no significant differences were observed in the Tukey test between Japanese and

non-Japanese teacher emotions within the same lighting condition, the results are still noteworthy. Recognition accuracy for full-light Japanese versus full-light non-Japanese ($p = 0.9992$) and point-light Japanese versus point-light non-Japanese ($p = 0.1825$) showed trends that suggest cultural background might play a subtle role, even if the differences were not large enough to reach statistical significance after controlling for the risk of Type I error. While the lighting condition clearly influenced recognition accuracy, the potential influence of cultural background within the same lighting condition remains unclear.

Figure 2 shows how accurately students were able to perceive specific Japanese and non-Japanese teacher emotions in the two conditions, point-light and full-light. The results appear remarkably similar between the two teacher backgrounds for both conditions, with the full-light display condition allowing for much more accurate perception of teacher emotion. The one-sample *t*-test, exploring how significantly perception accuracy differs from the baseline of 11.1% returned both high *t*-statistic values (5.45 for point-light and 30.31 for full-light) and extremely low *p*-values ($5.4e-08$ for point-light and $5.4e-08$ for full-light), allowing for the rejection of the null hypothesis in both cases. Effect sizes, measured by Cohen's *d*, were 0.09 for point-light display and 0.49 for full-light display, showing that while both conditions are significantly different from the baseline, as one might expect, the full-light condition has a stronger, more practical impact on emotion recognition.

In Figure 3, Perception of positive and negative emotions by cultural background, the accuracy of student perception of teacher emotion is broken down by teacher cultural background and emotional valence. Accurate perception was consistently higher of both positive and negative emotions of both Japanese and non-Japanese teacher emotions in the full-light condition, and positive

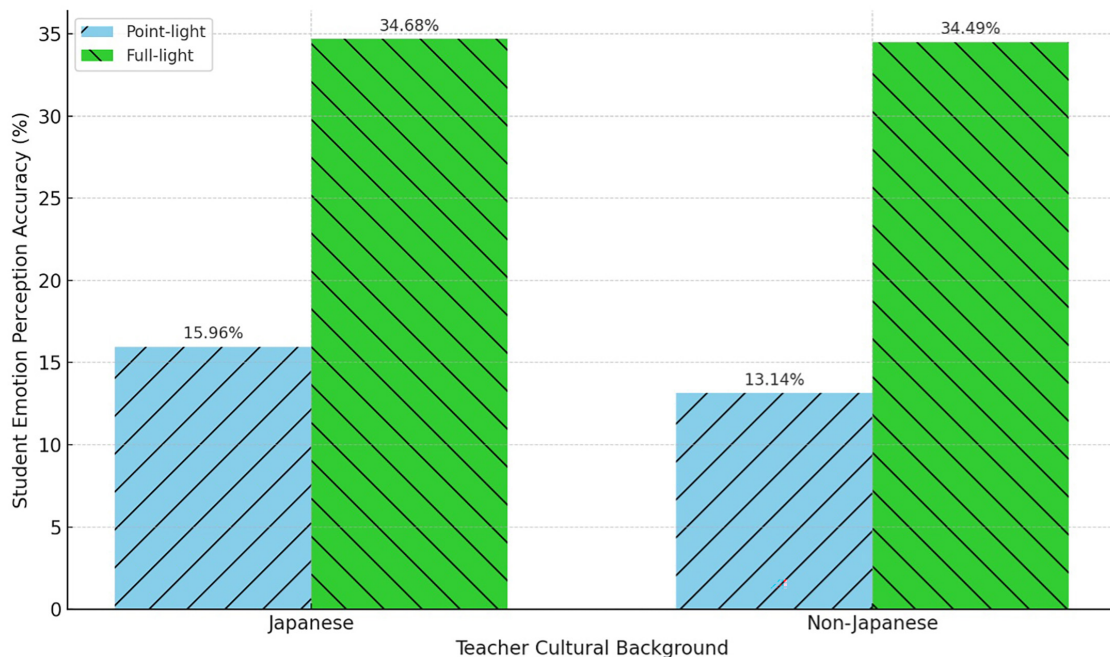
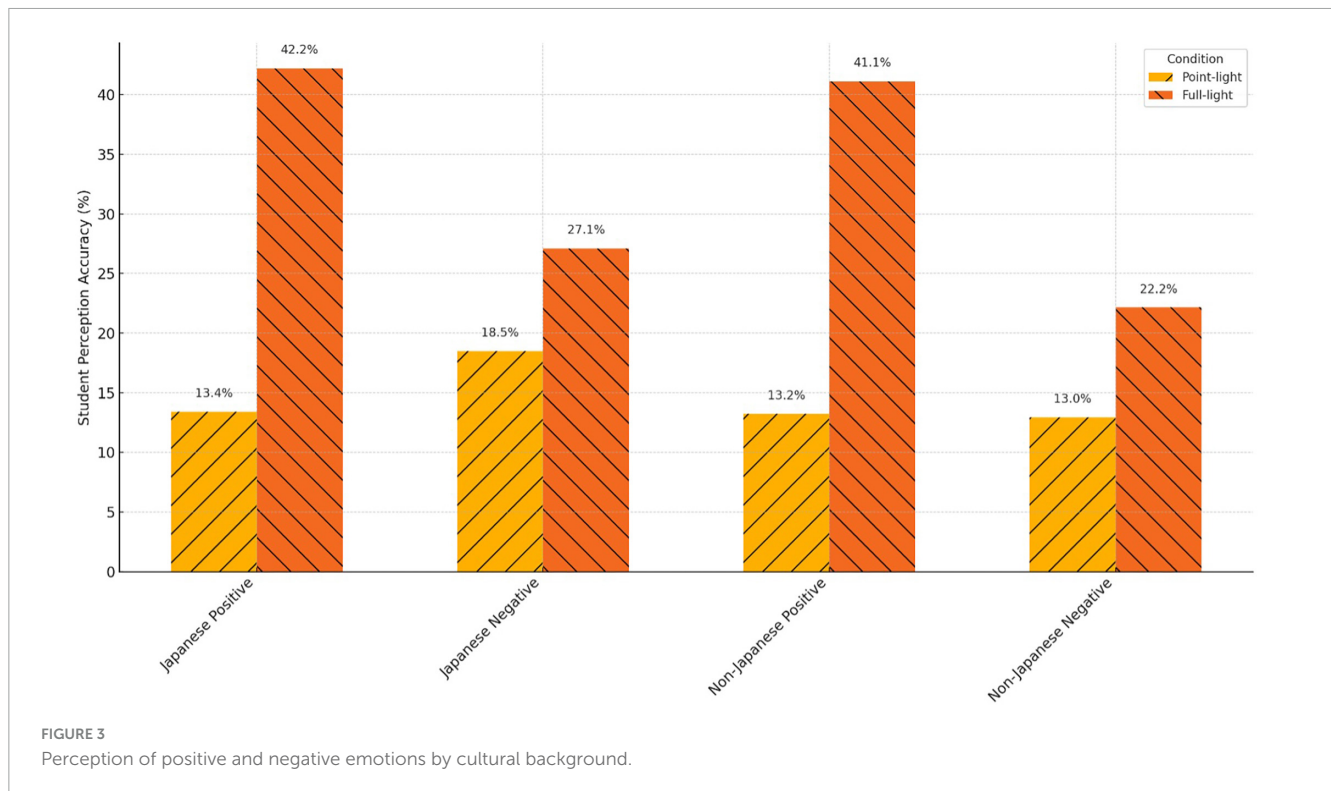


FIGURE 2
Accuracy of perceived emotion: point-light and full-light (teacher cultural background).



emotions were more accurately perceived than negative emotions in this condition. Negative Japanese teacher emotions were about 5% more accurately perceived than non-Japanese teacher emotions in both light conditions. It should be noted that, while *surprise* has previously been considered to be neutral, valence determined by context (Ekman, 2004), here it is considered a positive emotion. The teachers who labelled their videos with *surprise* clarified that they were “pleasantly surprised by what a student said,” “surprised that a student knew about something” and “surprised that a student had brought an item,” all positively valenced experiences. The figures in Figure 3 are weighted averages, accounting for varying perception accuracy rates of specific positive emotions based on how frequently each emotion expression appeared in the data.

Figure 4 presents a detailed breakdown of perception accuracy for specific Japanese and non-Japanese teacher emotions in the point-light and full-light conditions. This visualization highlights key trends, including the comparative ease with which all emotions except *sadness* were perceived in the full-light condition and the extent to which positive non-Japanese teacher emotions were perceived in this condition. In the point-light condition this trend is reversed, with Japanese teacher emotions more readily perceived for five of the six applicable emotions.

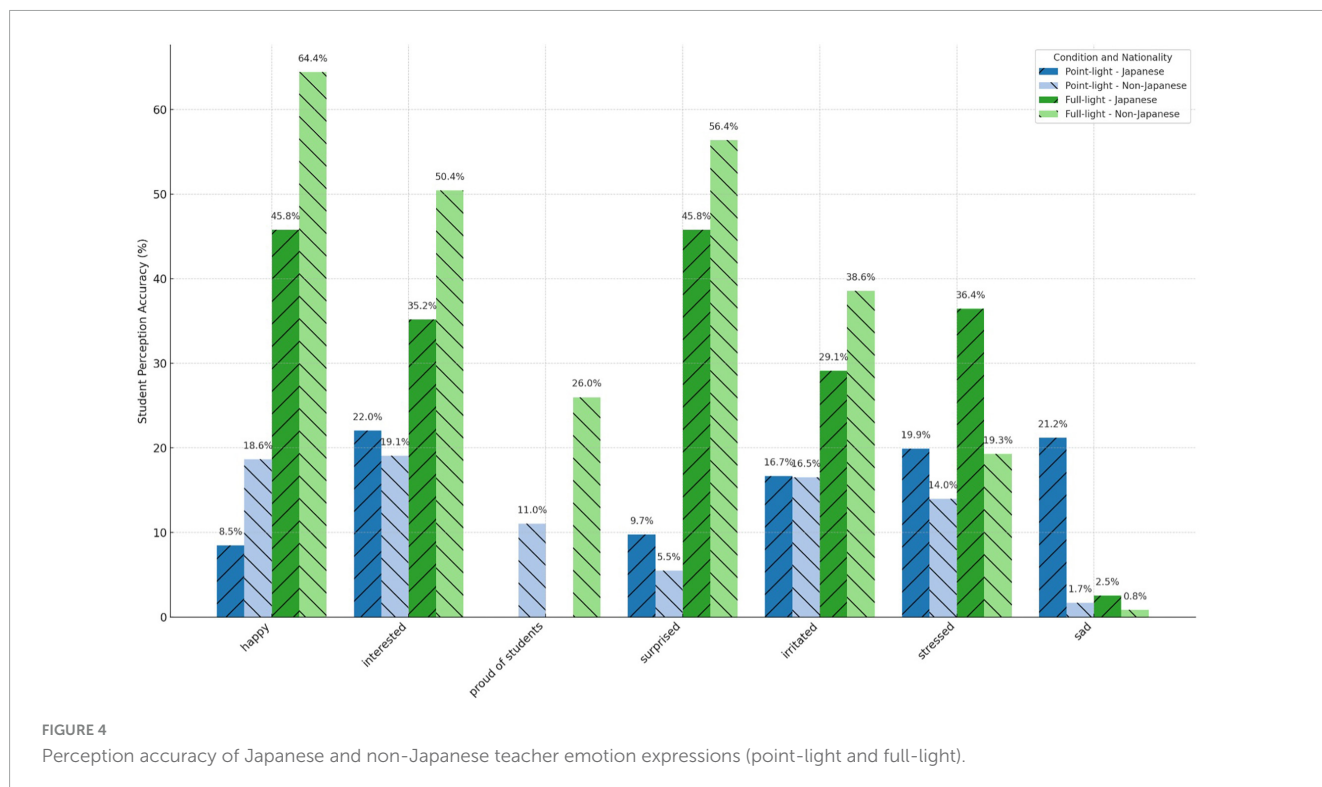
As noted above, Japanese teacher participants did not report feeling *proud* (of students), and neither Japanese nor non-Japanese teacher participants reported feeling *afraid* in their recorded teaching session. Each remaining emotion is represented across both groups.

5 Discussion

By comparing perception accuracy rates of Japanese and non-Japanese teacher emotion expressions in spontaneous authentic full- and point-light video stimuli and exploring whether positive or negative emotion expressions were more readily perceived, insights were gained into how emotional perception is influenced by shared cultural background. While the differences between groups did not pass the threshold for statistical significance, the data shows in-group advantage (Elfenbein and Ambady, 2002b)—the tendency for individuals to more accurately recognize emotions expressed by members of their own cultural group. This advantage is particularly apparent in the perception of negative emotions in the point-light condition, where subtle cultural cues may become amplified.

5.1 Perception accuracy full-light vs. point-light conditions

It was hypothesized that teachers’ emotion expressions would be more accurately perceived in the full-light stimuli than in the point-light stimuli and the data broadly supports this hypothesis. Overall accuracy was more than double in the full-light condition compared to the point-light condition (Figure 2). These results are to be expected: the availability of facial expressions and other visual cues in the full-light condition substantially enhances students’ ability to recognize teacher emotion expressions. Most emotions were recognized significantly more accurately in the full-light condition, with *happy* and *surprised* showing particularly strong improvements. *Sadness* stood out as the only emotion better recognized in the point-light condition. This reversal may indicate that certain emotions, like sadness, rely more heavily on subtle



body language and head movements, which were emphasized in the point-light stimuli.

5.2 Perception accuracy of the emotion expressions of Japanese and non-Japanese teachers

It was hypothesized that student participants would perceive the emotion expressions of Japanese more accurately than those of non-Japanese teachers, and when all emotion expressions are considered together, this appears to be the case. Japanese teachers' emotions were slightly more accurately recognized overall than those of non-Japanese teachers, particularly in the point-light condition (Figure 2). When emotion expressions are divided by valence, perception accuracy of Japanese teachers is again modestly higher when positive emotion expressions are considered: (27.8% vs. 27.15%, Figure 3). The difference in the perception of the negative emotion expressions of Japanese teachers when compared to non-Japanese teachers is somewhat larger (22.8% vs. 17.6%). In all these figures (weighted averages), perception accuracy of Japanese teacher emotion expression is higher than that of non-Japanese teachers. These results align with the theory of in-group advantage, which suggests that shared cultural norms enhance emotion recognition. However, consideration of individual emotions reveals a more complex interplay of cultural factors, emotional regulation, and familiarity.

The highest perception accuracy figures in the dataset were for positive emotions expressed by non-Japanese teachers, particularly *happy*, *surprised*, and *interested* (Figure 4). This suggests that, in the full-light condition, non-Japanese teachers may benefit from cultural norms favoring more explicit emotion expressions,

characteristic of their low-context cultures (Hall, 1976). These findings also align with research indicating that Western teachers often use emotion regulation strategies to consciously amplify their positive emotions as part of their professional role (Oplatka, 2009; Sutton et al., 2009; Taxer and Frenzel, 2015).²

In contrast, Japanese teachers, while using positive emotion expressions to build rapport and show approval (Hosotani and Imai-Matsumura, 2011), tend to rely on staged or socially prescribed emotional displays rather than the amplification of existing spontaneous emotions. Japanese students, accustomed to seeing such manufactured displays from Japanese teachers, may have struggled to accurately perceive their more subtle spontaneous genuine emotions in the video stimuli used in this study.

5.3 Accuracy of perception of positive and negative teacher emotions

It was hypothesized that the perception of positive emotions would be more accurate than that of negative emotions regarding both Japanese and non-Japanese teacher emotions. The data supported this hypothesis. As previously noted, Western teachers have been found to make efforts to amplify their positive feelings,

² It should perhaps be reiterated here that a mix of Inner Circle country (Kachru, 1998) teachers were deliberately gathered because the Japanese student body is most familiar with teachers from these countries rather than from one specific country. This was undertaken in order to make any results more meaningful in this context. Rather than consider how the individual cultural backgrounds of the non-Japanese teachers, or, for example, the rural or urban upbringing of the Japanese teachers impact the ways and extent to which they express emotion, therefore, here each teacher group is treated as homogenous.

and Japanese teachers to stage their display when they consider the emotion to be appropriate, whether they experience the emotion at that moment. In terms of negative emotions, teachers in general are careful to limit their display of emotion in the classroom (Sutton et al., 2009; Hosotani and Imai-Matsumura, 2011). Cultural display rules (Ekman and Friesen, 1969a,b) dictate that people should not show emotion in public that would disrupt social interaction (Ekman, 1972; Diefendorff and Greguras, 2009). As such, Japanese people have been described as replacing the facial expressions that accompany negative feelings with the facial expressions that accompany more acceptable emotions (Lebra, 1976; Argyle, 1988). It was assumed, therefore, that both the emotions displayed, and their intensity, would be influenced by the formality of the educational setting, the teachers' awareness of their own role within it, and the Japanese culture of many of the participants. The researchers expected that the students would show higher perception accuracy of positive than negative emotions as a result.

Although in the full-light condition the perception of the positive emotions of non-Japanese teachers was generally stronger than that of Japanese teachers, in the point-light condition the in-group advantage became more apparent with five of the six available data points showing higher perception accuracy of Japanese teacher emotions, three of which are negative. The highest of these is *sadness*, one of the emotions that Hosotani and Imai-Matsumura (2011) explain that Japanese teachers both express authentically and stage displays of unfeigned emotion to evoke emotion in the learners in their classrooms, with empathetic expressions of sadness used to foster the establishment of supportive teacher-student relationships. This would seem to indicate that the students' familiarity with the genuine expression of this emotion by their teachers has led to their heightened ability to recognize it.

In the point-light condition, where only the movement of the body and angle of the head give clues to the emotion of the teacher being observed, subtle body movements become emphasized. Students' heightened awareness of the Japanese teachers' negative emotions in this condition may be connected to self-preservation strategies in hierarchical classroom dynamics.

Students may be more aware of teachers' negative emotions so as to be able to mitigate them. The fact that Japanese teacher *stress* was also better-perceived than non-Japanese teacher *stress*, in both the point- and full-light conditions would seem to support this supposition. While cultural display rules dictate emotional restraint in formal settings, greater student accuracy in perceiving negative emotions of Japanese teachers may reflect teachers' deliberate use of subtle emotional regulation to manage classroom dynamics.

Emotion perception studies that examine in-group advantage tend to simply report on whether specific emotions are more easily perceived by members of the same cultural group. The most easily perceived emotion expressions in this study are of non-Japanese teacher positive emotions in the full-light condition, which does not support the presence of an in-group advantage for Japanese students. In the point-light condition, however, Japanese negative emotions were more readily perceived, suggesting that in-group advantage may in fact be present. The ability to quickly and consistently recognize emotions is central to effective social interactions (Van Kleef et al., 2011), enabling individuals to achieve critical socioemotional goals such as fostering cooperation, building relationships, and defending against threats (Castro et al., 2016; Martinez et al., 2016). In

the classroom, where collaboration between students and teachers is essential for meaningful learning experiences, the accurate recognition of emotions, particularly negative emotions, becomes especially important. Negative emotions often act as warning signals, requiring immediate attention and action, and students may rely on cultural familiarity to interpret these cues effectively. These findings suggest that while in-group advantage may not universally apply across all conditions, it may pertain to some emotions. This highlights the need for further exploration of how cultural dynamics and environmental factors interact to shape emotion recognition in educational settings.

5.4 Limitations of this study and future directions

While this study provides valuable insights into how Japanese students perceive teacher emotions under different visual conditions, several limitations should be acknowledged. First, the study did not examine teachers' emotional regulation strategies, such as the suppression of negative emotions or the amplification of positive ones. This choice was made to allow the focus to remain on perception accuracy: regardless of whether teachers make use of emotional regulation strategies, this study aimed to measure how aware of teacher emotion students are. Future research could build on these findings by exploring how different emotional regulation strategies (for example, expressive suppression or cognitive reappraisal; Gross et al., 2006) influence student perception. Second, this study focused on Japanese students and their interactions with Japanese and non-Japanese teachers. While this focus allowed for an in-depth examination of emotion perception within a specific cultural and educational context, it limits the generalizability of the findings to other cultural settings. Future research could broaden the scope by including diverse student populations and teacher demographics to better understand cross-cultural variations in emotion perception. The use of an entirely female teaching pool for the stimulus videos is another limitation. Although this decision was made to keep the stimuli consistent, and to minimize potential effects of gender differences in emotional expression, future studies could explore how teacher gender influences students' perception of emotions. Finally, future research exploring the role of teacher tone of voice and pitch in perception of emotion expressions may allow a more comprehensive understanding of how multiple channels of communication contribute to emotional understanding in educational settings.

5.5 Conclusion

This study offers valuable insights into how students perceive teacher emotions under different visual conditions, and how cultural factors and emotion types influence these perceptions. The use of authentic dynamic stimuli collected in real classroom environments, rather than dramatized or posed materials, strengthens the ecological validity of the findings (Nelson and Russell, 2013). The reduced accuracy in the point-light condition suggests that students rely heavily on facial

expressions to accurately interpret teachers' emotion expressions, particularly when interacting with teachers from different cultural backgrounds. The findings suggest that in cross-cultural educational settings, attention should be paid to how teachers are trained to use culturally adaptive non-verbal communication strategies, and how students are supported into interpreting these signals, as suggested by Nixon and Bull (2005). Schools should foster greater cultural awareness to mitigate potential problems in cross-cultural teacher student interactions. Addressing these factors could enhance emotional understanding and thereby improve teacher-student interactions and relationships. In this context, where, despite ongoing government efforts to improve English proficiency (Aizawa and Rose, 2019), few attain communicative competency (Morita, 2017) and continue to compare poorly with learners in other countries (Educational Testing Service TOEIC, 2018), improving mutual understanding may be the key. Though this study began with the premise that the Japanese students would better perceive the Japanese teachers' emotion expressions, this was not borne out by the data. Japanese teachers also need guidance on how to better connect with the learners in their classrooms.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Kyoto Institute of Technology, Kyoto, Japan. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

References

- Aizawa, I., and Rose, H. (2019). An analysis of Japan's English as medium of instruction initiatives within higher education: The gap between MESO-level policy and micro-level practice. *High. Educ.* 77, 1125–1142. doi: 10.1007/s10734-018-0323-5
- Argyle, M. (1988). *Bodily communication*, 2nd Edn. New York, NY: International Universities Press.
- Atkinson, A. P., Dittrich, W. H., Gemmell, A. J., and Young, A. W. (2004). Emotion perception from dynamic and static body expressions in point-light and full-light displays. *Perception* 33, 717–746. doi: 10.1068/p5096
- Aviezer, H., Trope, Y., and Todorov, A. (2012). Body cues, not facial expressions, discriminate between intense positive and negative emotions. *Science* 338, 1225–1229. doi: 10.1126/science.1224313
- Banerjee, N., Stearns, E., Moller, S., and Mickelson, R. A. (2017). Teacher job satisfaction and student achievement: The roles of teacher professional community and teacher collaboration in schools. *Am. J. Educ.* 123, 203–241. doi: 10.1086/689932
- Bänziger, T., and Scherer, K. R. (2010). "Introducing the Geneva multimodal emotion portrayal (gemep) corpus," in *Blueprint for affective computing: A sourcebook*, eds T. Bänziger and E. Roesch (Oxford: Oxford University Press), 271–294.
- Becker, E. S., Goetz, T., Morger, V., and Ranellucci, J. (2014). The importance of teachers' emotions and instructional behavior for their students' emotions – An experience sampling analysis. *Teach. Teach. Educ.* 43, 15–26. doi: 10.1016/j.tate.2014.05.002
- Bente, G., Roth, D., Dratsch, T., and Kaspar, K. (2016). Emotions of my kin: Disambiguating expressive body movement in minimal groups. *Cult. Brain* 4, 51–71.
- Birdwhistell, R. L. (1970). *Kinesics and context*. Philadelphia, PA: University of Pennsylvania Press.
- Brislin, R. W., and Freimanis, C. (2001). "Back-translation: A tool for cross-cultural research," in *An Encyclopedia of translation*, eds D. E. Pollard and C. Sin-Wai (Hong Kong: The Chinese University Press).

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- Burić, I., Slišković, A., and Macuka, I. (2018). A mixed-method approach to the assessment of teachers' emotions: Development and validation of the teacher emotion questionnaire. *Educ. Psychol.* 38, 325–349. doi: 10.1080/01443410.2017.1382682
- Carver, C. S., and Johnson, S. (2010). Authentic and hubristic pride: Differential relations to aspects of goal regulation, affect, and self-control. *J. Res. Pers.* 44, 698–703. doi: 10.1016/j.jrp.2010.09.004
- Castro, V. L., Cheng, Y., Halberstadt, A. G., and Grün, D. (2016). EU- ReKA! A conceptual model of emotion understanding. *Emot. Rev.* 8, 258–268. doi: 10.1177/1754073915580601
- Cheng, X., Xie, H., Hong, J., Bao, G., and Liu, Z. (2022). Teacher's emotional display affects students' perceptions of teacher's competence, feelings, and productivity in online small-group discussions. *Front. Psychol.* 12:795708. doi: 10.3389/fpsyg.2021.795708
- Chiba, R., Matsuura, H., and Yamamoto, A. (1995). Japanese attitudes toward English accents. *World Englishes* 14, 77–86. doi: 10.1111/j.1467-971X.1995.tb00341.x
- Clarke, T. J., Bradshaw, M. F., Field, D. T., Hampson, S. E., and Rose, D. (2005). The perception of emotion from body movement in point-light displays of interpersonal dialogue. *Perception* 34, 1171–1180. doi: 10.1068/p5203
- Dael, N., Goudbeek, M., and Scherer, K. R. (2013). Perceived gesture dynamics in nonverbal expression of emotion. *Perception* 42, 642–657. doi: 10.1068/p7364
- Darwin, C. (1872). *The expression of emotion in man and animals*. New York, NY: Oxford University Press.
- de Gelder, B., and Van den Stock, J. (2011). The bodily expressive action stimulus test (BEAST). Construction and validation of a stimulus basis for measuring perception of whole body expression of emotions. *Front. Psychol.* 2:181. doi: 10.3389/fpsyg.2011.00181
- de Gelder, B., de Borst, A. W., and Watson, R. (2015). The perception of emotion in body expressions. *Wiley Interdiscip. Rev. Cogn. Sci.* 2015, 149–158. doi: 10.1002/wcs.1335
- de Meijer, M. (1989). The contribution of general features of body movement to the attribution of emotions. *J. Nonverb. Behav.* 13, 247–268. doi: 10.1007/BF00990296
- Di Crosta, A., La Malva, P., Manna, C., Marin, A., Palumbo, R., Verrocchio, M. C., et al. (2020). The chieti affective action videos database, a resource for the study of emotions in psychology. *Sci Data* 7:32. doi: 10.1038/s41597-020-0366-1
- Diefendorff, J. M., and Greguras, G. J. (2009). Contextualizing emotional display rules: Examining the roles of targets and discrete emotions in shaping display rule perceptions. *J. Manag.* 35, 880–898. doi: 10.1177/0149206308321548
- Dittrich, W. H., Troscianko, T., Lea, S., and Morgan, D. (1996). Perception of emotion from dynamic point-light displays represented in dance. *Perception* 25, 727–738. doi: 10.1068/p250727
- Educational Testing Service TOEIC (2018). *2018 report on test takers worldwide (TOEIC listening and reading test)*. Princeton, NJ: Educational Testing Service TOEIC.
- Ekman, P. (1972). "Universals and cultural differences in facial expressions of emotion," in *Nebraska Symposium on motivation*, ed. J. R. Cole (Lincoln, NE: Nebraska University Press), 207–283.
- Ekman, P. (1980). *The face of man: Expressions of universal emotions in a New Guinea village*. New York, NY: Garland.
- Ekman, P. (1982). *Emotion in the human face*, 2nd Edn. New York, NY: Cambridge University Press.
- Ekman, P. (2004). "Emotional and conversational nonverbal signals," in *Language, knowledge, and representation*, eds J. M. Larrazabal and L. A. P. Miranda (Dordrecht: Springer), 39–50. doi: 10.1007/978-1-4020-2783-3_3
- Ekman, P., and Friesen, W. V. (1969a). Nonverbal leakage and clues to deception. *Psychiatry* 32, 88–106. doi: 10.1080/00332747.1969.11023575
- Ekman, P., and Friesen, W. V. (1969b). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica* 1, 49–98. doi: 10.1515/semi.1969.1.49
- Ekman, P., Friesen, W. V., and Hager, J. C. (2002). *Facial action coding system: The manual on CD ROM*. Salt Lake City, UT: A Human Face.
- Ekman, P., Friesen, W. V., O'Sullivan, M., Chan, A., Diacoyanni-Tarlatzis, I., Heider, K., et al. (1987). Universals and cultural differences in the judgments of facial expressions of emotion. *J. Pers. Soc. Psychol.* 53, 712–717. doi: 10.1037//0022-3514.53.4.712
- Elfenbein, H. A. (2013). Nonverbal dialects and accents in facial expressions of emotion. *Emot. Rev.* 5, 90–96. doi: 10.1177/1754073912451332
- Elfenbein, H. A., and Ambady, N. (2002b). On the universality and cultural specificity of emotion recognition: A meta-analysis. *Psychol. Bull.* 128, 203–235. doi: 10.1037/0033-2909.128.2.203
- Elfenbein, H. A., and Ambady, N. (2002a). Is there an in-group advantage in emotion recognition? *Psychol. Bull.* 128, 243–249. doi: 10.1037//0033-2909.128.2.243
- Elfenbein, H. A., Beaupré, M., Lévesque, M., and Hess, U. (2007). Toward a dialect theory: Cultural differences in the expression and recognition of posed facial expressions. *Emotion* 7, 131–146. doi: 10.1037/1528-3542.7.1.131
- Elfenbein, H. A., Mandal, M. K., Ambady, N., Harizuka, S., and Kumar, S. (2004). Hemifacial differences in the in-group advantage in emotion recognition. *Cogn. Emot.* 18, 613–629. doi: 10.1080/02699930341000257
- Fang, X., and Ge, Y. (2024). The impact of spontaneity and presentation mode on the in-group advantage in recognizing angry and disgusted facial expressions. *Acta Psychol. Sin.* 56, 701–713. doi: 10.3724/SP.J.1041.2024.00701
- Fang, X., Sauter, D. A., Heerdink, M. W., and van Kleef, G. A. (2022). Culture shapes the distinctiveness of posed and spontaneous facial expressions of anger and disgust. *J. Cross Cult. Psychol.* 53, 471–487. doi: 10.1177/00220221221095208
- Frenzel, A. C., Daniels, L., and Buria, I. (2021). Teacher emotions in the classroom and their implications for students. *Educ. Psychol.* 56, 250–264. doi: 10.1080/00461520.2021.1985501
- Frenzel, A. C., Fiedler, D., Marx, A. K. G., Reck, C., and Pekrun, R. (2020). Who enjoys teaching, and when? Between- and within-person evidence on teachers' appraisal-emotion links. *Front. Psychol.* 11:1092. doi: 10.3389/fpsyg.2020.01092
- Frenzel, A. C., Goetz, T., Lüdtke, O., Pekrun, R., and Sutton, R. E. (2009). Emotional transmission in the classroom: Exploring the relationship between teacher and student enjoyment. *J. Educ. Psychol.* 101, 705–716. doi: 10.1037/a0014695
- Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., et al. (2016). Measuring teachers' enjoyment, anger, and anxiety: The teacher emotions scales (TES). *Contemp. Educ. Psychol.* 46, 148–163. doi: 10.1016/j.cedpsych.2016.05.003
- Glowinski, D., Dael, N., Camurri, A., Volpe, G., Mortillaro, M., and Scherer, K. R. (2011). Towards a minimal representation of affective gestures. *IEEE Trans. Affect. Comput.* 2, 106–118. doi: 10.1109/T-AFFC.2011.7
- Gramipour, M., Shariatmadari, M., and Mahdi, S. (2019). The development of teacher academic emotions (TAE) scale. *J. Pedagog. Res.* 3, 60–79. doi: 10.33902/JPR.2019.5
- Gross, J. J., Richards, J. M., and John, O. P. (2006). "Emotion regulation in everyday life," in *Emotion regulation in families: Pathways to dysfunction and health*, eds D. K. Snyder, J. A. Simpson, and J. N. Hughes (Washington, DC: American Psychological Association), 13–35.
- Hall, E. T. (1976). *Beyond culture*. Garden City, NY: Anchor Press Doubleday.
- Hargreaves, A. (2001). Emotional geographies of teaching. *Teach. Coll. Rec.* 103, 1056–1080. doi: 10.1111/0161-4681.00142
- Hong, J., Nie, Y., Heddy, B., Monobe, G., Ruan, J., You, S., et al. (2016). Revising and validating achievement emotions questionnaire-teachers (AEQ-t). *Int. J. Educ. Psychol.* 5, 80–107. doi: 10.17583/ijep.2016.1395
- Horler, F., and Yamazaki, J. (1986). Response styles of Japanese and American college students. *JALT J.* 8, 83–88.
- Hosotani, R., and Imai-Matsumura, K. (2011). Emotional experience, expression, and regulation of high-quality Japanese elementary school teachers. *Teach. Teach. Educ.* 27, 1039–1048. doi: 10.1016/j.tate.2011.03.010
- Jack, R. E., Blais, C., Scheepers, C., Schyns, P. G., and Caldara, R. (2009). Cultural confusions show that facial expressions are not universal. *Report* 19, 1543–1548. doi: 10.1016/j.cub.2009.07.051
- JASP Team (2023). *JASP (Version 0.17.3) [Computer software]*. Philadelphia, PA: JASP Team.
- Kachru, B. B. (1998). English as an Asian language. *Links Lett.* 5, 89–108.
- Kang, S.-M., and Lau, A. S. (2013). Revisiting the out-group advantage in emotion recognition in a multicultural society: Further evidence for the in-group advantage. *Emotion* 13, 203–215. doi: 10.1037/a0030013
- Khosdelazad, S., Jorna, L. S., McDonald, S., Rakers, S. E., Huitema, R. B., Buunk, A. M., et al. (2020). Comparing static and dynamic emotion recognition tests: Performance of healthy participants. *PLoS One* 15:e0241297. doi: 10.1371/journal.pone.0241297
- Kilbride, J. E., and Yarczower, M. (1983). Ethnic bias in the recognition of facial expressions. *J. Nonverbal. Behav.* 8, 27–41. doi: 10.1007/BF00986328
- Kitayama, S., Mesquita, B., and Karasawa, M. (2006). Cultural affordances and emotional experience: Socially engaging and disengaging emotions in Japan and the United States. *J. Pers. Soc. Psychol.* 91, 890–903. doi: 10.1037/0022-3514.91.5.890
- Krumhuber, E. G., Küster, D., Namba, S., Shah, D., and Calvo, M. G. (2021). Emotion recognition from posed and spontaneous dynamic expressions: Human observers versus machine analysis. *Emotion* 21, 447–451. doi: 10.1037/emo0000712
- Kurokawa, S. (2020). The sooner, the better for English education in Japan?: A case study on English education at a private school in the Tokyo metropolitan area. *Komaba Lang. Assoc. J.* 6, 1–12. doi: 10.15083/00079279
- Lassila, E., and Uitto, M. (2016). The tensions between the ideal and experienced: Teacher-student relationships in stories told by beginning Japanese teachers. *Pedagog. Cult. Soc.* 24, 205–219. doi: 10.1080/14681366.2016.1149505
- Lebra, T. S. (1976). *Japanese patterns of behavior*. Honolulu, HI: University of Hawaii Press.
- Lebra, T. S. (1983). Shame and guilt: A psychocultural view of the Japanese self. *Ethos* 11, 192–209. doi: 10.1525/eth.1983.11.3.02a00070

- Lee, J. W., Jones, P. S., Mineyama, Y., and Zhang, E. (2002). Cultural differences in responses to a likert scale. *Res. Nurs. Health* 25, 295–306. doi: 10.1002/nur.10041
- Lightbown, P. M., and Spada, N. (2019). Teaching and learning in the L2 classroom: It's about time. *Lang. Teach.* 52, 1–11. doi: 10.1017/S0261444819000454
- Liljestrom, A., Roulston, K., and deMarrais, K. (2007). "There's no place for feeling like this in the workplace": Women teachers' anger in school settings," in *Emotion in education*, eds P. Schutz and R. Pekrun (London: Academic Press), 267–284.
- Lugaresi, C., Tang, J., Nash, H., McClanahan, C., Uboweja, E., Hays, M., et al. (2019). MediaPipe: A framework for building perception pipelines. *arXiv [Preprint]*. doi: 10.48550/arXiv.1906.08172 arXiv:1906.08172.
- Markham, R., and Wang, L. (1996). Recognition of emotion by Chinese and Australian children. *J. Cross Cult. Psychol.* 27, 616–643. doi: 10.1177/0022022196275008
- Martinez, L., Falvello, V. B., Aviezer, H., and Todorov, A. (2016). Contributions of facial expressions and body language to the rapid perception of dynamic emotions. *Cogn. Emot.* 30, 939–952. doi: 10.1080/02699931.2015.1035229
- Matsumoto, D. (1992). American-Japanese cultural differences in the recognition of universal facial expressions. *J. Cross Cult. Psychol.* 23, 72–84. doi: 10.1177/0022022192231005
- Matsumoto, D., and Ekman, P. (1989). American-Japanese cultural differences in intensity ratings of facial expressions of emotion. *Motiv. Emot.* 13, 143–157. doi: 10.1007/BF00992959
- Matsumoto, D., and Hwang, H. S. (2010). Judging faces in context. *Soc. Pers. Psychol. Comp.* 4, 393–402. doi: 10.1111/j.1751-9004.2010.00271.x
- Matsumoto, D., Olide, A., and Willingham, B. (2009a). Is there an ingroup advantage in recognizing spontaneously expressed emotions? *J. Nonverb. Behav.* 33, 181–191. doi: 10.1007/s10919-009-0068-z
- Matsumoto, D., Olide, A., Schug, J., Willingham, B., and Callan, M. (2009b). Cross-cultural judgments of spontaneous facial expressions of emotion. *J. Nonverb. Behav.* 33, 213–238. doi: 10.1007/s10919-009-0071-4
- McArthur, L. Z., and Baron, R. M. (1983). Toward an ecological theory of social perception. *Psychol. Rev.* 90, 215–238. doi: 10.1037/0033-295X.90.3.215
- Ministry of Education, Culture, Sports, Science and Technology [MEXT] (2018). *National curriculum standard for elementary school*. Tokyo: Ministry of Education, Culture, Sports, Science and Technology.
- Montepare, J. M., Goldstein, S. B., and Clausen, A. (1987). The identification of emotions from gait information. *J. Nonverb. Behav.* 11, 33–42. doi: 10.1007/BF00999605
- Morita, L. (2017). Why Japan isn't more attractive to highly-skilled migrants. *Cogent Soc. Sci.* 3:1306952. doi: 10.1080/23311886.2017.1306952
- Moskowitz, S., and Dewaele, J.-M. (2021). Is teacher happiness contagious? A study of the link between perceptions of language teacher happiness and student attitudes. *Innov. Lang. Learn. Teach.* 15, 114–117. doi: 10.1080/17501229.2019.1707205
- Namba, S., Makihara, S., Kabir, R. S., Miyatani, M., and Nakao, T. (2016). Spontaneous facial expressions are different from posed facial expressions: Morphological properties and dynamic sequences. *Curr. Psychol.* 36, 593–605. doi: 10.1007/s12144-016-9448-9
- Nelson, N. L., and Russell, J. A. (2013). Universality revisited. *Emot. Rev.* 5, 8–15. doi: 10.1177/1754073912457227
- Nixon, Y., and Bull, P. (2005). The effects of cultural awareness on nonverbal perceptual accuracy: British and Japanese training programmes. *J. Intercult. Commun.* 5, 1–16.
- Oplatka, I. (2009). Organizational citizenship behavior in teaching: The consequences for teachers, pupils, and the school. *Int. J. Educ. Manag.* 23, 375–389. doi: 10.1108/09513540910970476
- Oyserman, D., Coon, H. M., and Kimmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychol. Bull.* 128, 3–72. doi: 10.1037/0033-2909.128.1.3
- Richerson, P. J., and Boyd, R. (2005). *Not by genes alone: How culture transformed human evolution*. Chicago, IL: University of Chicago Press.
- Scherer, K. R., and Bänziger, T. (2010). "On the use of actor portrayals in research on emotional expression," in *Blueprint for affective computing: A sourcebook*, eds K. R. Scherer, T. Bänziger, and E. Roesch (Oxford: Oxford University Press).
- Sogon, S., and Masutani, M. (1989). Identification of emotion from body movements: A cross-cultural study of American and Japanese. *Psychol. Rep.* 65, 35–46. doi: 10.2466/pr0.1989.65.1.35
- Sutton, R. E., Mudrey-Camino, R., and Knight, C. (2009). Teachers' emotion regulation and classroom management. *Theory Pract.* 48, 130–137. doi: 10.1080/00405840902776418
- Taxer, J. L., and Frenzel, A. C. (2015). Facets of teachers' emotional lives: A quantitative investigation of teachers' genuine, faked, and hidden emotions. *Teach. Educ.* 49, 78–88. doi: 10.1016/j.tate.2015.03.003
- Toh, G. (2013). "Scrutinizing the native speaker as referent, entity and project," in *NativeSpeakerism in Japan: Intergroup dynamics in foreign language education*, eds S. A. Houghton and D. J. Rivers (Bristol: Multilingual Matters), 183–195. doi: 10.21832/9781847698704-017
- Tomkins, S. S. (1962). *Affect imagery consciousness: The positive affects*, Vol. 1. New York, NY: Springer Publishing.
- Tomkins, S. S. (1963). *Affect imagery consciousness: The negative affects*, Vol. 2. New York, NY: Springer Publishing.
- Tracy, J. L., and Robins, R. W. (2004). Show your pride: Evidence for a discrete emotion expression. *Psychol. Sci.* 15, 194–197. doi: 10.1111/j.0956-7976.2004.01503008.x
- Tracy, J. L., Shariff, A. F., Zhao, W., and Henrich, J. (2013). Cross-cultural evidence that the nonverbal expression of pride is an automatic status signal. *J. Exp. Psychol. Gen.* 142, 163–180. doi: 10.1037/a0028412
- Uitto, M., Jokikokko, K., and Estola, E. (2015). Virtual special issue on teachers and emotions in teaching and teacher education (TATE) in 1985–2014. *Teach. Teach. Educ.* 50, 124–135. doi: 10.1016/j.tate.2015.05.008
- Van Kleef, G. A., Van Doorn, E. A., Heerdink, M. W., and Koning, L. F. (2011). Emotion is for influence. *Eur. Rev. Soc. Psychol.* 22, 114–163. doi: 10.1080/10463283.2011.627192
- Winograd, K. (2003). The functions of teacher emotions: The good, the bad, and the ugly. *Teach. Coll. Rec.* 105, 1641–1673. doi: 10.1046/j.1467-9620.2003.00304.x
- Zax, M., and Takahashi, S. (1967). Cultural influences on response style: Comparisons of Japanese and American college students. *J. Soc. Psychol.* 71, 3–10. doi: 10.1080/00224545.1967.9919760
- Zembylas, M. (2005). Beyond teacher cognition and teacher beliefs: The value of the ethnography of emotions in teaching. *Int. J. Qual. Stud. Educ.* 18, 465–487. doi: 10.1080/09518390500137642
- Zieber, N., Kangas, A., Hock, A., and Bhatt, R. S. (2014). Infants' perception of emotion from body movements. *Child Dev.* 85, 675–684. doi: 10.1111/cdev.12134