

The nonverbal communication of emotions

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We review research on social communication occurring via nonverbal expressions of emotion. Early studies suggest that a small number of emotions are associated with distinct nonverbal expressions — including facial and bodily displays, and vocal bursts — which are reliably recognized and displayed across cultures. More recent work has sought to address the question of why these expressions exist; that is, what function they serve. A Two-Stage Model of the evolution of emotion expressions suggests that although expressions originally served internal, physiological functions, they later came to serve more social, communicative functions. In fact, a growing body of research indicates that emotion expressions signal: basic information about whether expressers should be approached or avoided, and more specific personality trait information about expressers. In addition, expressions shape behavior; they promote tendencies to approach or avoid, and influence judgments and decision-making in a range of domains, including resource distribution. In each case, distinct emotion expressions (e.g. fear, pride) have theoretically predictable, emotion-specific effects on observers' perceptions and responses. Overall, findings suggest that emotion expressions are adaptive communicative signals, which have a major impact on everyday social communication.

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The study of nonverbal communication via emotions originated with Darwin's claim that emotion expressions evolved in humans from pre-human nonverbal displays [1]. This claim received its first empirical support a century later, with the finding that people living in remote regions of the world, including Papua New Guinea and Borneo, identified American facial expressions of six different emotions in the same way Westerners did. This finding — that people everywhere, including members of geographically and culturally isolated traditional

small-scale societies, recognized the nonverbal displays associated with emotions — provided the first evidence for universality of these six expressions, and also the strongest evidence to date supporting Darwin's claim [2^{••},3].

Those six emotions — anger, disgust, fear, happiness, sadness, and surprise — have acquired a special status in the scientific literature [4]. In recent years, additional evidence for universality — either from cross-cultural recognition studies or cross-cultural production studies (i.e. demonstrating that a particular expression is reliably *displayed* by individuals across cultures) — has emerged for the original six [5,6], as well as contempt [7,8,9^{••}], shame, and pride [8,10[•],11,12^{••}]. Although several researchers have noted that cross-cultural recognition rates falter when non-forced-choice response methods are used [13], the preponderance of evidence demonstrating cross-cultural agreement using several different forced-choice approaches, along with the smaller body of evidence from cross-cultural production studies, indicates that these nine expressions are likely to be human universals, though their social value, frequency of occurrence, and specific function may differ across cultures.

Interestingly, shame and pride displays differ from the original six, and from contempt, in that they involve changes in body posture and head movements as well as facial displays — suggesting that emotional communication is not restricted to the face. In fact, the bodily components of these two expressions may be more important than the corresponding facial behaviors [12^{••},14]; one study found that congenitally blind athletes who had never seen others display these expressions spontaneously responded to success and failure by showing pride-linked and shame-linked postural movements [12^{••}].

Recognition studies have examined several other expressions as well; most notably, embarrassment, awe, romantic love, and sympathy — but evidence for the universality of these remains elusive [8,15–18]. Further supporting the importance of non-facial displays, studies have examined an additional modality of emotional communication: vocal bursts. These displays occur through emotionally inflected speech, independent of verbal content, or through distinct vocalizations such as laughing, growling, and screaming. Compelling evidence supports the cross-cultural recognition of distinct bursts associated with each of the original six emotions [19,20^{••}], and emerging work suggests that at least five others might

also have distinct, cross-culturally recognized bursts: desire, achievement/triumph, embarrassment, contentment, and awe (D Cordaro, D Keltner, S Tshering, D Wangchuk, L Flynn, The voice conveys emotion in ten globalized cultures and one remote village in Bhutan, unpublished data).

What do emotion expressions communicate?

Darwin's original focus was on the physiological functions served by emotion expressions; for example, the widening of eyes in fear, which function to increase the expresser's peripheral vision in response to environmental threat [21]. More recently, researchers have suggested that although expressions originally evolved to serve internal, physiological functions, they later came to serve secondary communicative functions [22••]. This shift is thought to have occurred through a process of ritualization, wherein the nonverbal behaviors occurring with particular emotions (e.g. eyes widening with fear) became reliably associated with those emotions, and, as a result, came to serve as a signal of them [23]. As a result, emotion expressions became exaggerated into the highly recognizable and prototypical forms we observe them in today (see [22••,24]), which function to signal important information to observers. In the case of fear, the critical information communicated is the presence of a threat. Observers benefit from recognizing not only the emotion conveyed, but also the broader social message [23]. Displayers also benefit, by quickly communicating a message that serves their needs. For example, anger communicates an impending threat, thereby sparing both parties the resources required to fight it out [25].

Building on this account, a growing body of current research is examining the social communicative functions of distinct expressions. To take one example, studies have demonstrated that, upon seeing a pride expression, observers across diverse cultures automatically perceive the displayer as deserving an increase in social rank [11,26]. They respond to that message by treating proud individuals as leaders and a source of cultural wisdom, and they show a bias toward copying and learning from them [27•,28] (Figure 1).

To approach or avoid

Perhaps the most important message sent by any emotion expression is the communication of whether an observer should approach or avoid the expresser, or something in the environment. In their first year of life, infants use their parents' nonverbal displays of fear, anger, and happiness to determine whether it is safe to approach novel people and ambiguous situations. Between 1–2 year old infants respond to mothers' displays of fear by avoiding crossing what appears to be a cliff [30]. Fear also tells onlookers that the displayer needs help, and motivates approach tendencies in many social species [31,32]. By adulthood, this response is so ingrained it can be seen in low-level

motor behavior. Upon viewing a fear display only briefly, adults demonstrate a tendency to pull a level toward themselves — suggesting a desire to bring the fearful individual closer in [33•,34].

Anger expressions, in contrast, promote the exact opposite: avoidance and a tendency to distance oneself from the expresser. Anger faces lead to automatic pushing (instead of pulling) motor responses [33•], and more general behavioral inhibition; upon viewing subliminally presented images of an angry face, participants pour themselves less juice from a pitcher they've been offered, and drink less of what they take [35].

This basic-level tendency to approach or avoid in response to certain expressions also influences subsequent higher-level cognitions and behavior. In one example, briefly observed expressions shown by newscasters covering a presidential election influenced voting decisions of those who saw the coverage. Observers who saw a newscaster display positive emotions while discussing particular candidate were more likely to approach — or, in this case, vote for — that candidate ([36] see also [37]).

Personality perception

In addition to signaling low-level information about whether to approach or avoid, emotion expressions also communicate more complex information about expressers' personality or social role. Knutson found that several expressions shift perceptions of dominance and affiliation, such that individuals who display fearful or sad expressions are perceived as low in dominance, and those who display anger or disgust are seen as high in dominance but low in affiliation. Happiness displayers are seen as high in both affiliation and dominance [38].

Other research has replicated the finding that anger displays promote judgments of dominance [39], although, at an implicit level, pride displays send a stronger message of high status than anger [26]. An additional caveat is the finding, from several studies, that the lowered brow component of the anger expression conveys dominance primarily in Western, but not non-Western, cultures [40].

In addition to increasing perceptions of dominance — at least in Western cultures — anger displays also reduce perceptions of trustworthiness [41]. In contrast, embarrassment expressions can increase perceptions of trust. Those who blush following a social transgression receive greater trust in a subsequent task, compared to transgressors who display no emotional response [42]. These findings indicate that the display of certain expressions can alter observers' judgments of social situations.

Several researchers have suggested that the link between expressions such as fear and anger, and perceived personality dispositions such as affiliation and dominance,

Figure 1



Prototypical examples of the nine emotion expressions found to be cross-culturally recognized and/or displayed. From left to right and top to bottom: surprise, happiness, disgust, fear, anger, pride, sadness, shame, and contempt. Images taken from the UC Davis Set of Emotion Expressions [29].

is due to the level of maturity conveyed by these displays. In this view, these expressions evolved in tandem with nonverbal cues of maturity [43]. Facial features such as high, thin brows, a smaller or receding jaw, thick lips, and large, round eyes, are perceived as 'babyish' at a trait level, and result in judgments of physical and social

weakness, submissiveness, warmth, and femininity [44–46]. In contrast, low brows, a large jaw, and smaller eyes increase perceptions of maturity. Fear and anger expressions may have evolved in such a way as to capitalize on these trait perceptions, and maximize or minimize the appearance of babyishness in a person

displaying each expression [43]. Theoretically, the increased appearance of immaturity would enhance the fear expression's ability to communicate need, and promote approach behaviors toward the fearful individual, whereas the enhanced appearance of maturity would increase the anger expression's ability to communicate competence or threat. Consistent with this account, participants rate both fear and anger expressions as strongly associated with physical cues of maturity (i.e. more or less rounded jaw), and with maturity-linked traits such as submissiveness, warmth, and weakness.

The associations between emotions and personality perceptions may be bi-directional. Several studies have found that dispositional inferences made on the basis of observed facial physiognomy influence judgments of emotion expressions. Faces judged as trustworthy — on the basis of subtle, computer generated differences in the eyebrows and mouth — are perceived as displaying more intense happiness than faces judged as less trustworthy, even when both in fact show the same degree of happiness. In contrast, untrustworthy faces are perceived as displaying more intense anger than trustworthy faces, again when both actually display the same amount of the emotion [47]. This research suggests that trustworthy judgments are partly based on physiognomic similarities to behaviors involved in the expressions of anger and happiness (more specifically, the eyebrow and mouth regions of the face), and that the perception of the social messages communicated by emotion expressions can be biased by aspects of a displayer's facial structure which may be unrelated to actual emotional state.

All of these results are consistent with studies emphasizing that there is no one-to-one correspondence between a given facial expression and the message it conveys, but rather that contextual factors, linked to the expresser, the responder, and the situation itself, can shift the outcome of these judgments [48,49]. Individuals begin taking context into account when judging expressions from an early age; three-year-olds who observe an individual display unwarranted distress (i.e. an overreaction) are less likely to show concern and help than if they are unaware of the cause of the distress, or if the distress is justified [50].

Judgments and decision-making

In shifting person perceptions, emotion expressions can also shift perceivers' behaviors toward the expresser. For example, waiters who smile are given larger tips [51], and smiling transgressors are given leaner punishments than their non-smiling counterparts [52]. Displays of sadness can also promote financial gain: when shown by needy individuals, observers give them larger charitable donations [53]. In contrast, pride displays shown by the needy reduce the amount of financial aid received; presumably because, by communicating high status and competence, pride sends a message of low need (CM Steckler, D

Randles, JL Tracy, The financial cost of displaying pride: expansive posture reduces the receipt of altruistic donations, University of British Columbia, unpublished data).

Studies of economic decision-making also demonstrate an impact of emotion expressions on judgments about equitable resource distribution. In the Ultimatum Game, a 'Proposer' is given a sum of money to split with his or her partner in any way he or she chooses, with the caveat that the partner must accept the split in order for either player to receive anything. Proposers tend to make higher offers to Responders who display anger while threatening to reject offers below a certain threshold — suggesting that anger sends the message that a threat should be believed [54]. Conversely, Responders are more likely to accept offers made by Proposers who smile than by those who display anger — pointing to the importance of communicating affiliation in negotiations [55]. These studies suggest that individuals seek to cooperate most with those who seem either particularly threatening or friendly — and, more broadly, that emotion expressions play an important role in communicating social intentions.

Conclusion

The burgeoning body of work on the nonverbal communication of emotion suggests that emotion expressions are integral to everyday social communication. These displays send messages that are distinct to each expression, and which are likely to have evolved, at least in part, to serve a communicative function. As research in this area progresses, we expect to see evidence of a broader range of both visually observed and vocally displayed expressions sending emotion-specific socially significant messages, which have adaptive consequences for both senders and receivers.

Conflict of interest statement

Nothing declared.

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- of special interest
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